MEASURING OCCUPATIONAL STRESS WITHIN A CROSS SECTION OF THE WORKING GHANAIAN POPULATION AND DETERMINING ITS RELATIONSHIP WITH HEALTH

BY

MARGARET KIMIKO YORHORMEH AGAMA (MD)

SUBMITTED TO THE DEPARTMENT OF PSYCHOLOGY, UNIVERSITY OF GHANA, LEGON IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE MASTER OF PHYLOSOPHY (M.Phil) DEGREE IN PSYCHOLOGY (CLINICAL).

DEPARTMENT OF PSYCHOLOGY
UNIVERSITY OF GHANA
LEGON

21st June 2000

Dedicated to the four most influential men in my life, who have influenced and shaped it in many ways.
To Sam, my son's Richard and Martin and Daddy.

DECLARATION

This thesis " Measuring Occupational Stress within a cross section of the working Ghanaian population and determining its relationship to health" is a study done and presented to the Department of Psychology for the award of the Master of Philosophy (MPhil) Degree in Psychology (Clinical). Except for any references duly cited, it represents an original study, which has not yet been presented anywhere for any degree.

Margaret K.Y. Agama
(MD)
Candidate

Dr. Angela L. Ofori-Attah
(Second Supervisor)

Prof. S Danquah
(Principal Supervisor)

Acknowledgements

I am greatly in-debited to so many people that it would be absolutely impossible to mention them all. My prayer is that each and every one of them will know how thankful and truly grateful I am.

I thank God for given me the courage and the wisdom to carry this out, ten years after leaving University and well into my medical career. And for all the support that He provided directly and through others through the most difficult times. I am also grateful to the Officers and men of the Golden Triangle for being the inspiration and bringing me to the realisation that this work was necessary.

I thank my parents Helen and Godfried Agama, whose belief in education has brought me this far and for their encouragement, and to my brothers Keli and John for their support. I am indeed grateful to my teachers and supervisors especially Prof. S. Danquah and Dr Angela L. Ofori-Attah for given me direction and food for thought. I thank also my employers at the 37 Military Hospital, Accra and of the Ghana Armed Forces for their support and best wishes.

I especially thank all the people who assisted in the data collection at the various institutions and the people who provided the data. I would like to mention Col. C. S Modey of the Ghana Armed forces who helped me gain access to the various institutions.

To Amele, Fafa, Emefa, Amatele, David, Junior and Kofi-Mensah, all in Ghana and Mr Tennyson Darko and 'Controversial Tia-Man' of the USA, I say a big thank you for the assistance you gave with the data.

I also deeply appreciate the support I received from Lt. Col. Johnney Okai and family and from Lt. Col. Emma Nibo and family, especially Betty for being a pillar of strength that the children and I could always lean on.

Very special thanks goes to my two son's Richard and Martin-Godfried who did all they could inspite of their youth, to help me succeed. Their pride in me helped me keep going through out this project.

Finally and equally importantly I would like to thank Lt. Col. Sammy Akai Nettey without whom this work would never have been completed. His support in many diverse ways cannot be told of here and is priceless. He is as much of this thesis as I am, if not more. To him I will forever be, eternally grateful.

M. K. Y. Agama.

Table of Content

List of Tables

Appendices

Abstract

The major objectives of the study were to determine if Occupational stress existed amongst Ghanaian workers, and if there was a relationship between Occupational Stress and Health. It was also the objective of the study to collect normative data for the Ghanaian Population.

Four hundred and sixteen Government employees in both managerial and non managerial positions were selected from key Government Organizations, including the security Services.

These employees completed two inventories, the Occupational Stress Inventory (OSI) which has three Domains, the Occupational Role Domain, the Personal Strain Domain and the Personal Resources Domain. The Inventory measures Occupational Stress and Personal Strain and gives an indication of the Coping resources available to the individual to relieve these stresses.

The second Inventory was the Stress Symptom Inventory that consisted of emotional symptoms due to stress that the employees could be experiencing.

Correlational Analyses were done between the Occupational Stress Inventory, its Domains, the Stress Symptoms Inventory and the number of visits to hospital. The results revealed on the measures used that the employees of this study did experience Occupational Stress and Personal Strain. There were no differences between managers and non-managers. Results did show that the participants did make use of various Personal Resources in order to relieve their stress and that they sought medical attention for the Symptoms that they suffered for these Stresses.

study however indicated that in spite of the Personal Resources available to the ployee, these resources were either inadequate or failed them entirely. It has refore been suggested that a more in attention be given to Occupational Stress in work place, and that emphasis should be paid to the relationship between cupational Stress and health. There should be more education for members as to v to improve their Personal Resources.

CHAPTER ONE

INTRODUCTION

Stress

Stress is an everyday feature of life and stress as a concept has been studied for over a Hundred years. The term stress is so ubiquitous that it is used as a noun when we talk about being under stress, as a verb when events are stressing and as an adjective when modern life has become stressful. (Ross and Altmaier, 1994).

Chapter one will overview stress in general terms, and take a cursory look at its relationship with occupational stress and health. There will be a more in-depth view in Chapter two.

Stress in physics is strictly a force which when applied to a system modifies its form. Psychological and social forces and pressures, in the form of events or situations, can be referred to as stressors when they exert a disturbing effect upon a person's equilibrium. Psychological tension can also be referred to as stress; in this case the causal agent can be referred to as a stressor (WHO, 1994).

Ivancevich (1994) defines stress as a person's physical, chemical and mental reaction to stressors and stimuli in the enviroment. It occurs whenever environmental forces (stimuli) throw the body and mental fractions of a person out of equilibrium. However Lazarus's Transactional Model or Inter-Actional Model (Lazarus and Launier, 1978; Lazarus and Folkman, 1984) is the most recognised model today for defining stress. It defines stress as occurring when there is an imbalance between demands and resources, and emphasises the ongoing nature of the balance or imbalance. It also states

that the enviroment can influence people and that people can influence environments, thus any particular person-enviroment has implications for both person and the enviroment. Lazarus emphasised the cognitive aspects of stress that is concerned with how people perceive or appraise the enviroment. This he believes will determine whether or not stress is present

There is a lot of literature available on stress in the Western World, and its effects on health. Unfortunately as much as stress is spoken of within Africa; and by Africans, to date, only a hand full of studies have been done to examine its effects on Africans. There are no norms or data available in this regard, which the individual experiences or makes use of. There is no standardised definition of stress for Africans or by Africans.

The early studies of stress were done in the field of medicine (Davidson and Neal, 1997). For years it has been known that the various physical diseases can be produced in laboratory animals by exposure to severe stressors. The diseases produced in such studies were the classic psycho-physiological disorders such as ulcers and cardiac diseases. In the first decade of this century, physicians described the relationship between certain personality patterns and subsequent disease. As a result of a number of research and available evidence, it has been revealed that illness, in particular the psycho-physiological disorders, may in part be stress related (Davidson and Neal, 1997). This has been supported by animal research which has been conducted into the various physical diseases (namely the psychophysical disorders). These have been produced in laboratory animals by exposing them to severe stresses (Davidson and Neal, 1997). Other researchers such

as Sklar and Anismar, (1979) have been able to show that a broader range of diseases may be related to stress such as cancer.

As early as 1936, Hans Selye, a physician introduced the General Adaptation Syndrome (GAS) as his definition of stress. This is a description of the biological reaction to sustain and unrelenting stress. There are three phases to the model, during the first phase the alarm reaction, the autonomic nervous system is activated by the stress, if the stress is too powerful, gastrointestinal-ulcers form, the adrenal glands become enlarged, and there is atrophy of the thymus. During the second phase, resistance, the individual adapts to the stress through available coping mechanisms. If the stress persists or the individual is unable to respond effectively, the third phase, a stage of exhaustion, follows, and the individual dies or suffers irreversible damage (Selye,1950).

Selye was interested in the response of the body to demands made upon it, and believed that 'these responses' were due to 'non-specific' levels of certain hormones. The problem with this definition of stress however, is that these response-based definitions of stress are not clear-cut. Subsequent research however continued to consider stress as a response to environmental conditions, defined on the basis of such diverse criteria as emotional upset, deterioration of performance and physiological changes, such as increased skin conductance or an increase in the levels of certain hormones.

Further research looked on stress as a stimulus often referred to as stressors, and identified a long list of environmental conditions-, which include daily hassles. Stimuli that are considered to be stressors could be major or minor, acute or chronic such as a persistently unpleasant work environment.

Finally there is a wide variation in how people respond to life's challenges, which induce stress. The same event does not create the same amount of stress in different people (Davidson and Neal, 1997). Some researchers like Larzarus, (1966) believe that it is rather how we perceive or appraise the environment that determines whether or not a stressor is present. When a person determines that the demands of a situation exceed his / her resources, the person experiences stress (Davidson and Neal, 1997). Thus the concept of coping is very relevant in regarding how people try to deal with problems or handle the emotions that the problems produce. Even for those who appraise the situation as stressful, the effects of the stress may vary depending on how the individual copes with the event. Effective coping therefore varies with a given situation (Lazarus and Folkman, 1984).

Stress and its relationship to health

Nakajima, (Director-General WHO, 1990-1998) observed that stress affects everyone and although it can serve as a useful stimulus, excessive stress can lead to physical and mental illness. Stress and an inability to cope with it, leads to both physical and mental illness, as well as to lesser, yet disturbing consequences such as demoralization and lack of motivation. These contribute to reducing people's quality of life and their ability to function optimally.

Stress is important to health not only because of the role that it plays in illness, but also because of the psychological treatments that are being developed to manage the psycho-physiological diseases. Understanding

stress and its adverse effects will allow for the maintenance and promotion of more healthy behaviours.

Health workers must be able to recognise the effects of stress, and know how to deal with them. They need to enhance their skills for listening and communicating with their clients. This in turn will make it easier for them to suggest what forms of support may be needed or at least to advise their clients where to obtain help. Action taken now can reduce some of today's stresses. It can also show people how to cope better with stress and thus minimise its consequences (Nakajima, 1994). The relationship between stress and health will be discussed in more detail in chapter two as part of the literature review.

Definition of terms

Occupational Stress:

Occupational stress as defined by Ross and Altmaire, (1994) is the interaction of work conditions with the characteristics of the worker. When the demands of work exceed the ability of the worker to cope with the work conditions.

Strain:

Karasek, (1997) defined strain as an employment situation in which the person experiences a high level of demand, too much work and too little time in which to do it. Coupled with little authority to make decisions and lack of opportunity to make full use of his or her skills on the job.

Coping:

Pearlin and Schooler, (1978) defined coping as any response to an external life strain that serves to prevent, avoid, and control emotional distress.

Classification of Stress

The ICD classification:

Classified under psychological factors affecting medical conditions (F54)

The DSM IV classification:

Occupational stress is classified on Axis IV under Psychosocial and Environmental Problems (DSM IV).

OCCUPATIONAL STRESS

Occupational stress and health

Studies on stress reactions and their causes in a wide range of occupational groups in several Western countries, have made it possible to identify a number of factors in the work enviroment that may be hazardous to health.

Occupational Stress has been identified as being linked to psycho physiological diseases such as hypertension, ulcers and asthma.

There are also emotional and cognitive problems that occur under conditions of job stress. The behavioural symptoms fall into two categories:

a. Symptoms that belong to the worker and
b. Symptoms that belong to the organisation (Ross and Altmaire, 1994).

Particular work conditions have been linked to certain physical ailment and conditions. These include conditions such as headaches, cardiovascular diseases, gastrointestinal conditions (ulcer), allergies, skin diseases, sleep disturbances and respiratory diseases.

It is difficult to know how much these ailments are caused by the job itself versus other aspects of the workers life (Ross and Altmaire, 1994).

Essential hypertension is viewed as a heterogeneous condition brought on by many possible disturbances in the various systems on the body that are responsible for regulating blood pressure, including psychological mechanisms. Many of these psychological mechanisms can be affected by psychological stress (Davidson and Neal, 1997).

Job stresses have been found to produce short-term elevations in blood pressure, and blood pressure also fluctuates in daily life depending on a person's mood rising notably through anger (Schwartz, Warren and Pickering, 1994).

Kasl and Cobbs, (1970) examined the effect of the loss of employment on employees and showed that there was elevated blood pressure in men who anticipated loosing their jobs, after termination of their employment and during the initial probation period of the new job. Those that had difficulty finding stable employment suffered the longest period of high blood pressure.

Fredrickson and Mathews, (1990) showed that chronic psychological stress is widely accepted as an important factor in essential hypertension. Other studies showed that harassment causes blood pressure to rise, but that for men also, aggressing against a source of frustration then helps blood pressure to decrease (Hokanson and Burgen, (1962); Hokanson, Burgess and Cohen, (1963); Hokanson, Willers and Koropsak, (1968); Stone and Hokanson, (1969).

Obrist and his colleagues (1978) showed that reaction time task yielded significant increases in both heart rate and systolic blood pressure. Shapiro,

Jamner and Goldstein (1993), studying the effects of stresses amongst paramedics showed that while the group did not differ in blood pressure during low stress calls, in high stress calls, paramedics who were very angry and defensive had higher blood pressure.

Many studies have found that a high level of job strain is associated with increased risk for a myocardial infraction (Schall, Landsbergis and Baker, 1994). Myocardial infraction can also be triggered by chronic stresses such as financial worries.

Measuring Occupational Stress in a Ghanaian Population

There is increasing awareness of the role of psychosocial factors in the aetiology of health disorders. This has brought with it a justified demand for intensified epidemiological research in the relationships between psychosocial factors related to work and workers' health (Kalimo, 1986).

Kalimo (1986), has noted that a wide variety of self report stress questionnaires exist and the best provide a highly reliable and valid means of distinguishing between the severely distressed worker from the more normal. However an improved device is desirable for the purposes of occupational psychosocial hazard monitoring. In Ghana there is no scientifically acceptable method of measuring occupational stress. There is no existing test in Ghana, which is culturally sensitive for the direct measurement of Occupational Stress. There are no standard norms or data available.

Most people are diagnosed to be under stress in Ghana, when traditional practices such as interviews, physical examinations and laboratory

investigations do not yield any results and the psychological, behavioural and physical symptoms persist.

Diseases such as hypertension or high blood pressure, heart attacks and strokes are highly prevalent in Ghana. Most dangerous is hypertension without an evident organic cause (namely essential hypertension or primary hypertension). Hesse (1998) investigating the incidence of hypertension in a Ghanaian prison found that hypertension was increasingly becoming a public health concern especially as the population becomes more and more urbanised and westernised. The incidence in Accra, the capital city of Ghana he noted was between 8-11%. While there is ample research in the area of hypertension, heart attacks and stroke, no research has been done to directly link these diseases to stress, and there is no direct measure of how stress may lead to these diseases in Ghana.

These health issues are of concern within the Ghanaian population. There is therefore a need to ensure that the causes that can be attributed to stress and occupational stress in particular are detected in empirical studies.

DETERMINATION OF STRESS

The Interview method

It has been noted by Kroll et al., (1981) that 'the interview' is the most important technical instrument of all those professions concerned with man and his social functioning.

The interview method is the most practised method and non-invasive manner in which to obtain information about an individual. However the biggest problem with 'the interview method' is its standardisation. This problem has

been identified by the American Psychological Association which states 'Clearly it would be impractical to devise a psychiatric interview and mental status examination equally acceptable by practitioners who are enamoured by conflicting and often theoretical persuasions;' (American Psychological association, 1980).

The psychiatric interview has undergone marked changes during this century. It was initially modelled after medical history taking in a question and answer format. It was later developed by several researchers and became a free flowing exchange between the psychiatrist and the patient. As a result of this the study of mental disorders as an object of natural – history investigation requires that his/her difficulties be unravelled in the light of the fullest possible information concerning physical, biochemical, anatomical, physiological, pathological, social, psychological and educational factors and influences. This is a cross-sectional method of mental status examination and the genetic dynamic investigations of the patients life history and development sequence that the clinician attempts to formulates his /her hypothesis regarding the patients difficulties. The specialist is expected to make a diagnosis in terms of some disease entity.

The main shortfall of structured interviews is that, enthusiasm is not universal, and many experienced clinicians question the validity of these schedules. (Siassi,1984). As a result of the problems with the interview method many difficulties are not satisfactorily diagnosed and managed or not diagnosed at all.

Psychological Testing

Due to the difficulty in defining stress with precision, measurement of stress is also difficult. Various scales have been developed to measure life stresses in general as well as coping behaviours (Davidson and Neal, 1997). These measures are in wide use in Western countries.

Psychological tests are currently being employed in the solution of a wide range of practical problems. Similarly, psychological tests provide standardised tools for investigating varied problems as well as the influence environmental variables on human performance (Anastasi, 1990).

Standardisation and norms of psychological testing

There has been no standardisation of any occupational stress scale for use in Ghana. Standardisation implies uniformity of procedure in administering and scoring the test. If the scores obtained by different persons are to be compatible, testing conditions must obviously be the same for all (Anastasi, 1990).

Also important in standardisation is the establishment of norms. Psychological tests have no predetermined standards of passing or failing. Performance on each test is evaluated on the basis of empirical data. An individual test score is interpreted by comparing it with the scores obtained by others on the same test. The norm is therefore the normal or average performance. There are no norms available on the subject of occupational stress for the Ghanaian population.

In standardising a test it is administered to a large representative sample of the type of persons for whom it is designed. This group is the standardised

sample. In establishing the norms it indicates not only the average performance but also the relative frequency of varying degrees of deviation. It permits the designation of the individual position with reference to the normative or standardised sample (Anastasi, 1990).

Standardisation and norms are equally important for various cultures since it gives an indication of how well or badly an individual is doing within that population. Reliability and validity are important characteristics that all good test must have. Standardisation of a test aims to eliminate or reduce to a minimum its inherent defects (Anum, 1998).

The scales of choice that will be used on the Ghanaian population are the Occupational Stress Inventory (OSI)-revised which was first developed by Osipow and Spokane in 1987 to measure Occupational Stress applicable across a variety of settings. It was revised in 1998. It considers three domains of occupational stress. These are occupational stress, psychological strain and coping responses. The second scale is the Stress Symptom Inventory (SSI).

The original research edition of the occupational stress inventory was based on theoretical modes of occupational stress and was exemplary in that it considered role strain, psychological strains as well as coping resources. It was designed to develop an integrated theoretical model to link these three important dimensions. It was also to develop generic occupational stress measure that would apply across different occupational levels and environments.

The revision provides normative data for both gender and specific occupational categories (i.e., executive, professional, technical, administrative support, public service/safety, and agricultural/production/labourer).

There are modifications to several original Occupational Stress Inventory items and generates new items for each of these domains. A number of corelational and multi-variant studies using the Occupational Stress Inventory have provided evidence of the relationship among stress, strain, and coping.

The Occupational Stress Inventory and the Stress Symptom Inventory are discussed in details in chapter three.

STATEMENT OF THE PROBLEM

There has been a great deal of work done in Western and more developed countries, resulting in a vast amount of available literature on the subject of occupational stress, its effects and its relationship to stress. However, despite rapid urbanisation and adoption of Western life styles in a developing country such as Ghana' stress research can be considered negligible if not ignored. If the assumption is that there is a correlation between stress and health in Western populations then it is reasonable to assume that the same is true in Ghana, although it has not yet been tested.

There is also a need to define and describe norms for an African population of what constitutes, occupational stress.

SIGNIFICANCE OF THE STUDY

It is expected that occupational Stress does not only exist among Africans but it also contributes to the high prevalence of the psycho- physiological diseases, which are highly prevalent in Africa. Research in this area is expected to open up a whole new area in which many of the discoveries made will be of immense benefit to Africans in general and Ghanaians in particular. The effects of urbanisation and westernization on African and Ghanaian populations can be monitored and assessed.

The information gathered will definitely improve working conditions for workers, not only at the institutional level but more importantly and in particular for the individual concerned. Employers would benefit since they would be able to institute programs that will be able to, not only detect stress at its early stage, but will also provide avenues for the stress to be dealt with. These measures should no doubt increase the productivity of the organization, but will improve workers' job satisfaction as well.

Scientific data will also provide information on psycho-physiological diseases in Africans, and perhaps more sensitive and African oriented forms of treatment could be developed.

Such a tool could serve as an early warning and allow for a greater role to be played by all health workers, including psychologists, in the management of stress and of the psycho physiological diseases in particular. The collection of norms for a standardized measurement of occupational stress will be the first of its kind in Ghana. It will also provide standardized norms and data for the early detection of occupational stress and its management.

THE MAJOR OBJECTIVES OF THE STUDY

1. To determine if occupational stress exists among Ghanaian workers.

2. To determine if there is a relationship between occupational stress and health.

3. To collect and provide normative data for the Ghanaian population on occupational stress.

AIMS OF THE STUDY

The aims of the study will be the following:

1. To determine if there is a relationship between occupational stress, symptoms of stress and the number of visits to hospital for treatment of stress related problems.

2. To determine if there is a relationship between occupational stress, personal strain and personal resources

3. To determine if there is a significant relationship between occupational stress, role level, social class, age and sex in the Ghanaian work force.

CHAPTER TWO

LITERATURE REVIEW

Introduction

The literature reviewed has focused mainly on literature available on the topic from within Africa, other third (3rd) world Countries and the International organizations, whose programs are directed towards Africa. The review of literature will show in the following chapters that job related stress exists and acts as a precursor to certain illnesses especially the psycho physiological diseases that are highly prevalent in Africans. Coping resources and responses are equally important in dealing with stress of any kind; this will also be discussed in some depth in the chapter.

The reason for the delayed focus on Occupational Stress may lie in history and the assumption that Africans can work without suffering any effects. Support now must be given to the evidence, which shows that the assumption was more than wrong.

Factors associated with occupational stress

Stress at work is the consequence of a combined exposure to a multitude of factors in the work environment and employment conditions (Kalimo, 1986). The factors that are associated with occupational stress include, role conflict, intra sender role conflict, person role conflict, role ambiguity, role overload, role under load, and shift work (Ross and Altmaire, 1994).

Whenever an individual joins an organization the individual brings with them their own values, beliefs and attitudes. The individual may be expected to work for long hours, meet high standards and perform more tasks than can be

handled. The individual may also be assigned to new responsibilities with lack of clear-cut requirements. There may be no standards of the scope of one's responsibilities to meet the demands of the job (Edekor, 1998).

Too much or too little work, time pressures and deadlines therefore can cause stress. By having to make too many decisions, fatigue from the physical strain of the work environment, excessive travel long hours further having to cope with changes at work, which includes cost in terms of money and career. Finally stress can be a result of making mistakes (Boadu, 1998).

Research in many countries during the past twenty (20) years has produced ample evidence that a relationship exists between certain types of working conditions and behavioural and psychosomatic disorders among workers (WHO, 1985). Most researchers now argue that stress facilitates performance up to a certain level, but beyond that level, additional stress results in a decline in performance (WHO, 1988). A review of studies on occupational stress and related psychological, physiological and behavioural disorders reveals that serious problems are found in roughly 5-10% of the working population, being higher among the higher age groups (WHO, 1985). Moderate stress related problems are reputed to exist in up to half of the workers in occupations which are characterised by a large number of stressors (WHO, 1985).

The workplace has been identified as a prime source of stress by the World Health Organization (Ross and Altimaire, 1994). Stress can result if workers fail to have some degree of influence and control over their work (Role conflict); perceive the product of work as meaningful and worthwhile (Role

Ambiguity); or feel an affinity with the workgroup as a social support system and identify with it through their work.

Role conflict exists whenever compliance with one set of role pressure makes compliance with another set of role pressures objectionable or impossible. (Beehr, 1985a; Ivancevich and Matteson, 1980). It includes

Inter sender role conflict a situation in which expectations, pressures or demands from one-person conflicts with the demands of another person.

Intra sender role conflict: occurs when the same member of the role set, ask an employee to perform activities which are mutually exclusive or incompatible.

Person role conflict when the demands of individuals work- roles conflict with the individuals personal values.

Inter role conflict: results when an employee experiences conflict between the expectations and demands of people at work and the expectations and demands of people outside work.

Role ambiguity, Is a job situation in which there are inadequate or misleading pieces of information about how an individual is supposed to do the job. (Beehr; 1985a).

Additionally, when the individual role is not clear, including lack of clarity about the objective of a job or the scope of individual responsibilities (Ivancevich and Matterson, 1980).

Other factors that exist in the workplace include work overload, under load, and shift work that may be defined as follows:

Role Overload, occurs when an individual is not able to complete the work that is part of a particular job.

Quantitative role overload occurs when the individual does not have enough time to complete all the work that is required for a job (French and Caplan, 1993).

Qualitative role overload involves not having adequate skills to do the job. Role Under-load occurs when a person's skill is under utilised.

Shift Work, having to work at times other than the traditional 9.00 a.m. to 5.00p.m day is another factor that might lead to occupational stress. Some occupations involve shift work out of necessity. Examples of these occupations include hospitals, fire/police services and public utilities, where there is need to have around-the-clock coverage.

Other jobs demand shift work because of the nature of the technology that is involved. Industries that fall into this category include steel, petrochemical and paper/pulp. Both mental efficiency and work motivation are directly and indirectly affected by shift work.

Not only are circadian cycles affected but also the shift work might lead the worker to experience domestic pressure, spousal/familial difficulties, and social isolation.

Other equally important factors in the work place includes poor job management, lack of job security, and monotonous tasks (Ross and Altimaire, 1994).

Psychological, Physiological and Behavioural Reactions of Workers

Workers in the work place under stress will experience psychological, physiological and behavioural reactions. Psychological reactions are associated with adverse psychological factors at work. These are namely

anxiety, depression, low self-esteem and low morale, anger and dissatisfaction.

Ross and Altmaire, (1994) classified stress factors which are primarily psychological in nature and are directly related to the physical work environment these include individual and work setting variables that influence occupational stress, job characteristics, inter-Personal work Relationship, organization structure and climate. The individual variables that influence occupational stress include personality characteristics, coping resources and coping responses of individuals.

Personality

Personality characteristics, these variables include the individuals' personality and control of events. For example Type A behaviour, which is characterised by several components such as a sense of time urgency, aggressive striving, a high level of hostility. The search for pre-dispositions for coronary heart disease has begun to focus on psychological factors and contemporary evidence linking coronary heart disease to psychological variables stems from investigations by two cardiologist, Meyer Friedman and Ray Rosenman, who identified the type A behaviour. These individuals have an intense competitive drive for achievement and advancement. They are over committed to their work, often attempt to carry on two activities at a time, and believe that to get something done well they must do it them-selves. Some theorise that the ongoing struggle to achieve in a visible, tangible fashion is driven by an underlying sense of insecurity and low self-esteem (Price, 1982;Williams et al, 1992).

They are likely to experience occupational stress simply by the way they view the world.

A second personality characteristic is a sense of control: This refers to the perception by an individual that his/her actions result in particular outcomes, particularly as these actions are important to those persons.

Control may also refer to an individual's perception of free choice among alternatives. Important aspects of control include:

the control experienced by workers (perceived control) and

the control that is exercised by workers (actual control)

Control both actual and perceived is related to occupational stress for the following reasons:

Understanding occupational stress involves knowing the degree to which an employee feels he/she has control over important aspects of work both the tasks that are involved and the work environment.

Research on learned helplessness suggest that workers who are 'burned out' may have come to believe that they have no control over important outcomes when such controls in fact exist.

Gender is not a personality characteristic but is part of what the individual brings to the work place. Women are experiencing the stresses of multiple roles particularly in the context of no previous experience to serve as resource for managing these multiple roles.

Physiological Reactions

Physiological reactions include increased secretion of epinephrine, norepinephrine, cortisone and other hormones elevated blood pressure,

increased levels of blood cholesterol and gastric secretion, and changes in metabolism.

Behavioural Reactions

Common behavioural reactions to stress are impaired performance, excess use and abuse of cigarettes, alcohol and assorted drugs and impaired inter personal relationships. For example in a study of 1540 managers Weimer (1977) found that four kinds of working conditions lead to the increased incidence of heavy smoking, hypertension, heart disease, high cholesterol, ulcer or obesity.

These conditions were: having too much (role over load) or too little to do (role underload), unclear job requirements that are too rigid. (role ambiguity), extreme role conflict, and extreme or no responsibility.

Emotional and Cognitive Functioning

Emotional reactions to inappropriate workload, role conflicts, interpersonal problems and other hazards in the work environment are perhaps the best known and commonly recognised indicators of unfavourable conditions at work (Kalimo, 1986).

Both inadequate workload and stress due to various causes have been shown to affect cognitive functioning and consecutively work performance. While short-term stress may often help an individual to mobilise his own resources and increase his effectiveness, long term overload; under load and stress of whatever cause has the opposite effect. (Kalimo,1986). In this regard Boadu, (1998) argued that stress should not be studied alone, but along with the coping mechanism those employees develop to handle stress. All these

factors must be considered in some depth in order to fully consider the subject of occupational stress.

Factors which ameliorate Work Stress

The Director General's progress report (that was presented on the WHO occupational health program presented to the thirty-second World health Assembly,1988) stated, "Work, the key element to progress and achievement, is the human being's main identification with a productive lifestyle. It is a human objective as well as a means of earning a living. This continuous interaction between man and his physical and psychological working environment may influence his health either positively or negatively and the Workers State of physical and mental well being influences the production process itself'.

However stress and its possible chronic morbid effects at the psychological, physiological and social levels are modified by numerous factors related to individual susceptibility and resistance. The key is distinguishing between the type and amount of stress that offers a stimulating challenge and that which presents an unreasonable threat to health.

Literature reviewed has shown that job characteristics, interpersonal work relationships, organisational structure, and climate all ameliorate stress.

Job Characteristics do ameliorate work stress and is that is with whom, or what controls the pace of work, particularly the amount of control an employee has over the work process. Ross and Altmaire,(1994) classify this as:

Machine pacing refers a work condition in which the speed of operation and production are controlled by some source other than the employee.

Human pacing refers to a situation in which the employee or some other human in the work setting, controls the process of work.

Repetition of Work is defined as work in which a discrete set of task activities are repeated over and over in the same order without planned interruptions by other activities and monotony describes the nature and impact of stimulation provided by work.

Boredom is an ill-defined concept with strong emotional correlates

Task Attributes believed to affect directly and indirectly the affective and behavioural responses of an employee to a job. An interaction between the individual and the attributes represents the best explanation of perceived occupational stress.

The inter personal work relationship between the worker and his co-workers is extremely important there are at least three types of interpersonal relationship;

1. Relationship with co-workers / workgroup relationship
2. Relationship with supervisors
3. Relationship with client or customers

The Organisational Structure and Climate are also important and are influenced by:

the organisational structure, one's position/level within an organisation, organisational culture and organisational territory. The following are important in organisational structure factors such as , entering the workplace, lack of training, building and maintaining a career, performance feedback, rewards, job future ambiguity and insecurity, job career transition.

Health and Psychological factors

The impact of psychological factors at work on workers' health and well being depends to a high degree on the socio-economic and cultural environment. Increasing awareness of the role played by psychological factors in the aetiology of health disorders has brought with it a justified demand for intensified epidemiological research on the connections between psychosocial factors related to work and workers' health.

The basic assumption for research on psychosocial factors in occupational health is that they can precipitate or counteract ill health, influence well-being and modify the outcome of health measures. Psychosocial factors at work can precipitate or counteract health impairment and affect the results of preventive and curative health measures.

For example in the early 1960's a relatively high incidence of peptic ulcer among workers' at a glass factory was reported from a developing country this was reported by a WHO survey which did not name the country (WHO,1988). It was found that in addition to diet and minor physical stresses in the work environment, the main factor associated with what proved to be a significantly high incident of acute peptic ulcer, was the way in which the wages were managed in seeking increased output from individual blowers.

In a comprehensive literature review, Oshuntokin (1988) observed the epidemiological transition-taking place in developing countries with increasing frequency of non-communicable diseases associated with economic development, industrialisation and psychosocial adaptation. His paper dealt with hypertension, coronary artery disease, diabetes mellitus, cerebro-vascular accidents; and certain types of cancer. He drew attention to the increasing

incidence of these diseases in African countries among both urban and rural dwellers. He also drew attention to the importance of changing life styles and behaviour patterns in the archaeology and maintenance of these diseases (Ezeilo, 1990).

Some Nigerian workers have drawn attention to the changing disease patterns following changing behaviour patterns of the 'modern' Nigerian. Nweze, (1984) discussed the 'big man', disease like stroke, hypertension and in fact sudden deaths are now on the increase in Nigeria.

He suggested that these might result from the stressful effects of social and cultural changes, which are far more exceeding the coping and adjustment resources of the average Nigerian. He reported that 30% of obituaries in newspapers are in the 30-65 age group being people who occupied high positions in society who died suddenly. The most significant types of change in behaviour appears to be frequent complaints of fatigue or of suffering from an ailment that has no organic basis or has only to a very minor extent. This may often be the only way in which the worker can communicate his personal psychological problems. Anecdotal reports that stress may have an impact on these diseases due to the impact of Westernisation and urbanisation of culture in Africa. These psychosomatic illnesses are organic pathologies known to result from continuously high automatic arousal due to prolonged stress. Many medical problems are either psychosomatic in nature or have psychological consequences which may influence the rate of recovery.

It is sometimes stated that all non-pathogenic organic pathologies are psychosomatic. The African is not immune to such diseases. It is our belief that

psychosomatic illnesses cannot be effectively treated without psychological intervention (Nweze, 1984).

In addition to strain reactions chronic conditions such as insomnia have been associated with unresolved stress. Recent research suggests that the experience of stress even for short periods reduce the efficiency of the body's immunological system (WHO,1988).

It is well known that physical and clinical hazards do have an effect on workers' physical health. And can also disturb psychosocial existence and diminish well being. The anticipation of a hazard can be a source of fear and anxiety. For example the search for the predisposition for coronary heart disease (CHD) has began to focus on psychological factors. Cardiologist Meyer Friedman and Ray Rosenman, (Friedman, 1969; Rosenman et al, 1975) found evidence linking coronary heart disease to psychological variables.

Coping Resources and Responses

It is equally important to find out what is available to people to assist them in coping, and extremely important here is the social support. This may include:

1. Emotional support i.e. when individuals feel they have other people to turn to for comfort during difficult times.
2. Social Integration when people feel they are a part of a larger group where interest and concerns are shared.
3. Tangible support where our request for money, tools, and assistance with a task is positively met.
4. Informational support where we can depend on others for advice concerning a problem.

5. Esteem support where social relationship serve to help people feel better about themselves and their skills and ability.
6. Nature of others the opportunity that social relationship gives us to nurture others.

Finally the coping responses, these are the actual response that people make in response to stress. That is a response, which deals with a problem, reduces psychological distress or changes the meaning of a situation. For coping responses to be effective the responses must be responses that modify or change a stressful situation, responses that change the meaning of a situation and those that manage stress.

The job situation is one area in which actual control is more difficult to exert, and thus the best coping methods are those which emphasise dealing with situations rather than changing them. Research indicates that support assists workers to deal with occupational stress in the same way that it does with other stressors.

Occupational stress in Western Populations

Occupational stress in Western and developed countries has been identified as an area of major concern and a great amount of research has been done in the field. Studies have shown that stress claims represent 15% of all occupational disease claims and that stress related occupational claims are increasing rapidly at the same time that all other disabling work injuries are decreasing (Pflanz, 1999).

The number of stress claims increased 700% between 1979 and 1988, and the cost per strain claim average approximately $ 12,000 per case, twice the average cost for all injury claims (Warsaw, 1988; Bentley, 1997).

The widespread prevalence of mental illness among workers demands that employers and occupational medicine specialist attend to the issue. Each year 15% of every work force will experience at least one episode of psychosocial disability (Warsaw, 1988).

In the United Kingdom, stress measurement, was seen by Trade Unions and employees as a major priority in the prevention of illness and in health promotion at the work place (WHO, 1985). Cost to the work place are incurred in part because of decreased productivity resulting from ineffective working, mistakes and faulty decisions (Pflanz, 1999). Work stress is estimated to cost industry $ 150 billion annually in lost productivity and workers compensation claims (Lehmer and Bentley, 1997). Schottenfeld and Cullen (1985) found that approximately 20% of all patients referred to an occupational medicine clinic in America, experience persistent somatic symptoms for which no organic cause can be found. 30% of American workers report exposure to mental stress at work, and 14% believe that their experiences of work stress could be deleterious to their mental health (Schilling; Brackbill, 1985; 1987). Robbins et al (1984), found that a consulting psychiatrist saw 1.2% of all employees each year, but these employees accounted for 17% of all visits to the occupational medicine clinic (Pflanz, 1999).

Work stress occurs across the spectrum of industry. However certain occupations and groups of workers may be more vulnerable to stress. Occupations with low autonomy and little personal control over work may

place individuals at higher risk for mental illness (Muntaner, 1991). This may have emphasis on the Military, with its emphasis on discipline, following of orders and deference to those of higher rank.

In a study of nurses in Sweden that was designed to assess whether job stress alters menstrual patterns in healthy female workers, the study observed that there was an association between perceived job strain and an elevation in plasma prolactin. As prolactin levels progressively increased so does luteal phase in-adequacy which leads ultimately to amenrhoea (Theorell, Ahlberg-Hulten, Jodko, and Sigala, dela Torre, 1993). Shift work that alters the natural circadian rhythms governing hormone secretion and the synchronisation on ovulatory event, have been found to modify menstrual profiles (Turek, Swann, and Earnest, 1994).

Compared with nurses working in hospital units classified as low stress environments those in high stress units showed a four to five fold risk of long cycles and monophasic cycles (RR 4.3, 95% CI 1.1-16.2, respectively). Among those who perceived their stress to be higher, the risk for long cycles was also raised (RR 2.3, 95% CI 0.6-8.0).

Among nurses reporting strenuous job activity, long cycles were somewhat more common (RR1.6, 95% CI 0.7-4.2) and luteal phase inadequacy somewhat less common (RR 0.5% CI 0.3-3.2) than for nurses reporting less strenuous work. Finally the small numbers of nurses working a rotating shift had somewhat higher rates of short cycle and inadequate luteal phases in comparison with nurses working either fixed day or fixed night shifts, but the differences were not statistically significant (Hatch, Talamanca, Salerno, 1999).

Inspite of the amount of research which has been done in these countries it is widely recognised that more research is needed to identify which workers are most vulnerable to work related stress (Pflanz 1999).

Occupational Stress in Developing Countries

There have been very few investigations on psychological factors at work and their health effects in developing countries (Mostapha, 1987).

The problems of most concern in developing countries appear to be those associated with the need to adapt to the rapid changes in working and living conditions that result from industrialization and urbanisation. This suggests that the main concern of developing countries is not the effect that industrialisation and urbanisation has on the worker(s) as an individual(s) but rather the effects of adoption of industrialisation and urbanisation as a whole. This is being done without consideration to realistic adaptation.

Workers in developing countries often have to make the transition from rural life, with its quiet and close relationships, to the factory environment. From traditional dependence on natural processes in agriculture and manual labour to standardized production, precise timing, rapid output and dependence on energy; and from identification with the land and crops to the impersonal environment of the machine (Mostapha, 1987).

Such a transition requires an effort in adaptation that is usually compensated for by the material rewards of organized employment, which, in turn provide the motivation to meet the challenges of adaptation. In many instances, however, adaptation fails because of either too much stress imposed by the type of work

or personal susceptibility or both; this results in absenteeism or in psychological and psychosomatic disturbances. (Mostapha, 1987).

The following general remarks relate to the psychosocial environment in developing countries. (Mostapha, 1987). Mostapha has contended that the socio- cultural environment is a determinant in the pattern of diseases and the frequency with which they are encountered.

The socio- economic status of a worker contributes to his susceptibility to psychosocial disorders. Furthermore a worker's educational background affects his reaction to industrial change and associated stress in developing countries. Educational background among a group of workers varies widely. Religion and cultural patterns greatly influence human reaction to stress and thus any resulting health effect. Economic conditions play a role in shaping psychosocial reaction and the capacity to cope with Occupational Stress. High employment rates and under employment may result in the acceptance of normally stressful types of employment.

Exposure to chemicals in adverse physical conditions in the working environment plays a role in shaping the psychosocial environment. Quite often, the existence of adverse working conditions lead to combined and probably aggravated effects on the workers health.

Thus the majority of the working populations in the developing countries are under served. Many workers are often economically disadvantaged, unorganised and not protected by occupational health and safety regulations. They have no labour protection measures and their occupational health problems may receive little attention by the health services (WHO, 1987).

Multi-factorial diseases, which are frequently work related, also, occur among the general population. Working conditions and harmful exposures need not be risk factors in each case of anyone disease. However when such diseases affect the worker, they may be work related in a number of groups,

they may be partially caused by adverse working conditions,

they may be aggravated, accelerated, or exacerbated by workplace exposures, and they may impair working capacity.

Epidemiological investigations have shown that an increased prevalence or risk of multi-factorial diseases such as hypertension, disorders of the locomotion system, chronic non-specific respiratory diseases, gastric and duodenal ulcers and a number of behavioural disorders may be found among certain regiments of the working population. Such diseases can therefore appropriately be called work related.

Multi-factorial work related diseases are often more common than occupational diseases and therefore deserve adequate alterations by the health services infra structure which incorporate and the occupational the occupational health services.

Occupational Stress in the Ghanaian Population

Work related stress is recognized as a major health and productivity hazard. There are a significant amount of about 600,000 deaths per year from heart attacks, several million Ghanaians have some form of heart and blood vessel disease, especially hypertension, which may be linked to work related stress (Boadu, 1998).

Hypertension is an important disease in both developed and developing countries. Countries such as Ghana are no exception. Hypertension is a major cause of pathology in vital organ systems such as the heart, brain, and kidneys. It is one of the principal risk factors for the two most important causes of mortality among adults', which are cardiovascular disease in the form of coronary heart disease, and congestive heart failure, and the cerebro-vascular diseases example stroke.

A few cases of hypertension can be attributed to endocrine problems such as adrenal tumours, vascular diseases, renal artery sternosis, or other specific defects.

Most cases are therefore considered "essential" in that the exact etiological factors and events responsible are not known. There is therefore a need to develop a better understanding of the risk factors for essential hypertension (Boadu, 1998).

It is generally felt that if the risk factors could be controlled there would be some substantial benefits. The Scientific group felt that modification of psychological influences might be one important approach to the prevention of essential hypertension, although more research is needed to determine the psychosocial characteristics of hypertension.

Individual vulnerability to stress varies widely and whereas one person can adapt to changes in his or her lifestyle, others will break down under similar conditions. Although we cannot avoid stress as long as we live we can learn a great deal about how to keep its changing side effects to a minimum. In other words one can better prepare and adapt to stress resulting in a reduction of its side effects.

Boadu (1998), continues to argue that with the society being dynamic we are fast beginning to see that many common diseases are largely due to errors in our adaptive response to stress, rather than to direct damage by germs, poisons or other external agents.

In this regard many nervous and emotional disturbances such as depression and anxiety, to name a few, high blood pressure, gastric and duodenal ulcers, certain types of rheumatic allergies, cardiovascular and renal diseases appear to be essentially diseases of adaptation (Boadu, 1998).

There is worldwide recognition of the fact that much of human organic pathology contains significant psychological origins and correlates and have psychological consequences. Besides, over 60% of persons reporting physical ailments have mostly psychological problems (Ezeilo1990). Ezeilo, of Nigeria showed that 65.15% of undergraduate out-patients showed no organic pathology following medical and laboratory examinations but reported symptoms of psychological distress on a symptom inventory.

This implied that over 60% of the people who sought medical attention would benefit from psychotherapeutic rather than chemotherapeutic attention. The Nigerian experience thus suggests that the African patient can benefit from psychological attention (Ezeilo, 1990).

Regarding the evidence for the work relatedness of psychosocial factors in hypertension, some investigators have reported that psychosocial stressors can result in increased blood concentrations of adrenaline and noradrenaline as well as cortisol, which accentuates the hypertensive effect of excessive salt intake.

It is accepted that acute stress causes an increase in cathecholamines and a transient increase in blood pressure. Also related is the fact that major non-hereditary risk factors for ischaemic heart disease includes hypertension, smoking and diet.

Methods for monitoring Occupational Stress

There are a large number and variety of methods for monitoring acute and long-term emotional reactions, which are available for use in most Western countries. To date the World Health Organisation's modification of the General Health Questionnaire appears to be reliable and valid instrument for its purpose. Kalimo in his review of this questionnaire noted that it is satisfying insensitive to cultural differences in the expression of emotional disturbances. (Kalimo, 1986).

Kalimo noted that there are a wide variety of self-report stress questionnaires that exist and the best provide a highly reliable and valid means of discriminating severely distressed workers from the more normal. However he noted that an improved device is desirable for the purpose of occupational psychosocial harzard monitoring. It is therefore not sufficient that there are measures available but these measures must be put to a more meaningful use in African countries in order that scientific results be obtained that are meaningful.

A Critique of current health care programs

Most health care programs aim at alleviating the sufferings of its client and restore this client as a holistic entity to a state of health that enables the client to function at an optimum level.

The health care programs in Africa have for long focused attention on health problems as caused by environmental factors and pathogenic organisms. A great deal of diseases are labelled idiopathic or of unknown origin. However some of these idiopathic conditions may be psychogenic as implied in the several publications relating psychological variables to physio-pathology (Mostapha, 1987).

According to Ezeilo African clients tend to present psychological distress through somatic symptoms. These are known psychosomatic symptoms with obvious organic diseases like hypertension, asthma, and peptic ulcer. These sometimes are called to the attention of the clinical psychologist but their psychogenic factors are yet to be empirically documented (Ezeilo, 1990). Any similarities or differences in the presentations of Africans and those in Western societies is yet to be appreciably documented.

The case for an African Stress Scale/Measurement

Preventive interventions and approaches in the work setting have been found in many instances to be effective in preventing the occurrence of these diseases or in mitigating their serious pathological consequences.

In developing countries particularly rural areas and small work places the primary health worker may be the sole provider of health protection and promotion services for both the worker and the rest of the community (Boadu,

1998). While workers in rural communities are not expected to experience the stress levels, which are associated with urban dwelling, they are expected to experience some amounts of stress. As a result of this personnel and resources are not only limited but also stretched. This is reflected in the current increase in the rate at which patients leave the hospital system and seek help from prayer houses, religious healers and traditional healers for their health problems which had not been dealt with, by the health care delivery system. Some patients patronize traditional and religious healers while undergoing medical treatment (Danquah, 1882 ; Ezeilo, 1990).

Psychologist experiences in Nigeria suggests that many of those patients who patronize these healers often become worse before coming to the attention of the psychologist, but recover following psycho therapeutic intervention (Mostapha, 1987).

Ezeilo, (1990) argues that 'there is clearly a need for the full integration of psychological services into the health care delivery system in order to enhance patient care. This may avert the exodus of patients from this system in search of the services of those who may further destroy them physically and emotionally.

Illness may be due to ignorance of health promoting behaviours e.g. essential hypertension may result from faulty stress coping behaviours, or to faulty beliefs. Edekor, (1998) in a comparative study of Job stress and coping in Ghana, in a population of female postal and bank workers, noted that 'Stress has been considered as a stimulus, a response and was an interaction between the environment and the individual. In addition, it does not seem

likely that different populations of people can each be accurately measured by a single life event measure'.

In Measuring Stress, she noted that respondents must have the same working environmental conditions, and a face - to - face interview session is recommended. In constructing a stress questionnaire questions measuring stress must include questions on environmental organizational stressors, social stress, family stress of the employee in the organization as well as symptoms of stress.

STATEMENT OF HYPOTHESIS

1. Occupational Stress does exist in the work place and differences will be found between the different role levels.
2. Differences will be found between male and female workers, on levels of occupational stress.
3. Occupational Stress, Role level, Sex, Social class and Age are linked and differences will be found between managers and non-managers.

4a. Occupational Stress, Personal Strain and Personal Resources are linked and

4b. Different coping mechanisms will be found between managers and non-managers.

5a. Occupational Stress and health in Ghana are linked and

5b. Differences will be found between managers and non-managers.

CHAPTER THREE

The Occupational Stress Inventory (OSI) Revised.

This is a concise measure of three dimensions or domains of

a. Occupational adjustment

b. Occupational stress, psychological strain, and

c. Coping resources.

The OSI was developed for two primary reasons:

1. To develop generic measures of occupational stressors that would apply across different occupational levels and environments (Osipow and Spokane, 1998).

2. To provide measures for an integrated theoretical model linking sources of stress in the work enviroment, the psychological strains experienced by individuals as a result of work stressors, and the coping resources available to combat the effects of stressors and alleviate strain.

Literature Review of the Occupational Stress Inventory revised

The literature reviewed gives examples of Researchers who have done some work in the field. French, (1976) viewed work settings and the resulting strain in terms of the interaction between the individual and the enviroment. His model suggested that work stresses occur primarily as a result of poor person-enviroment fit and are major producers of psychological and physiological strain. He thus defined occupational stress as those job characteristics that pose a threat to the individual.

Schuler, (1979) in another research outlined three types of stress (constraint stress, opportunity stress, and demand stress) which are related to

organisational qualities. These stresses have been related to a variety of negative physiological, psychological, and behavioural symptoms.

In both these models, occupational stresses are seen as having substantial consequences for the individual (i.e., strain) and affecting work performance (e.g. unwillingness to assume responsibility, lack of job involvement, lack of concern for other colleagues and the organisation, absenteeism, accident proneness, and other counterproductive behaviours).

Osipow and Spokane, (1981) saw the distinction between perceived stress and experienced strain as critical to any successful model of occupational stress and formed part of the underlying model for the OSI. They observed that of the instruments that have been developed to measure stress in work, most have ignored the work context dimension. They further observed that studies of occupational stress have examined those stresses inherent in certain occupations without giving substantial recognition to the stress involved in specific job roles that cut across both occupational fields and levels.

Coping skills were also seen as critical in the definition for any model of occupational stress and occupational mental health. (Lazarus, Averill, & Opton, 1974; Roskies and Lazarus, 1980).

Newman and Beehr (1979), identified four sets of coping behaviours which were:Self-care behaviour: emphasising engagement in healthy activities; Social support systems: emphasising relationships with family and friends, as well as social groups; Cognitive skills: which focus upon the ability to reduce stress through the effective management of time, effort, and reaction;

Recreational activities: which serve both as distracter from stressful events and as a source of life satisfaction outside of the work setting.

Normative data of the Occupational Stress Inventory

Normative data was collected from a sample of 909 adult subjects employed primarily in technical, professional and managerial positions in schools, service organisations and manufacturing settings. The mean age of the subjects was 46.46. Subjects were employed in their current job for a mean of 6.5 years. The sample was 48.8 percent male and 52.2 percent female.

The Reliability of the Occupational Stress Inventory

The first Occupational Stress Inventory scale which was constructed had the reliability and internal consistency of its form (E.1) determined. The two (2) week test-retest reliability were based on a sample size of 31 employed adults the total score across all scales was .90 for the ORQ, .94 for the PSQ, .88 for the PRQ. The test-retest reliabilities for the individual scales ranged from .56 to .94.

The internal consistency was based on a sample of N= 201 adults. The internal consistency (alpha) coefficients for the total questionnaire scores ranged from .83 to.92. Based on data from these reliability studies, item changes were accomplished and the resulting scales designated as Form E.2; which is the current Revised Version of the OSI. An internal consistency analysis was completed on the form E.2 using a sample of 549 working adults. The correlation coefficients for the total questionnaire scores were .89 (ORQ); .94(PSQ); and .99(PRQ). Correlation coefficient for individual scales

ranged from .71 to .94. Alexandra, (1983) reported comparable internal consistency data on samples of 155 military and civilian physicians.

Validity of the Occupational Stress Inventory

The validity of the occupational stress inventory was derived from four principal sources:

1. Factor analytical studies.

2. Corelational studies of the relationships of the scales to the variables are of practical and theoretical importance.

Studies' using the scales as outcome measures following stress reduction treatment. Studies of the stress, strain, and coping models employing comparisons of selected criterion groups.

Alexandra, (1983) did a second and independent confirmatory factor analysis and tested the factor structure of the ORQ, PSQ, and PRQ. He concluded that there was substantial agreement between the scales of the OSI and the patterns of factor loading. A large number of corelational and multivariate studies have employed the OSI as an experimental measure and provide evidence of the relationship between stress, strain, and coping. The studies provide moderate to strong support of the concurrent validity of the OSI. (Van Wagoner, 1985; Van Wagoner and Spokane, 1986).

Treatment Studies of the Occupational Stress Inventory

Higgins, (1986) used one or more of the OSI scales to assess the effectiveness of treatment to reduce occupationally induced stress or strain. In the first study (Higgins, 1986), two 7-sessions stress management programs

were compared with a wait-list control condition. One treatment program was behavioural, employing progressive relaxation and systematic desensitisation, whereas the second program was cognitive and consisted of training in time management, rational emotive therapy, and assertiveness training.

Outcome measures in this study were the total score from the PSQ, the Emotional Exhaustion Frequency (EEF) scale from the Maslach Burnout Inventory (Maslach and Jackson, 1981), and an absenteeism index. A random assignment, pre-post, control group design was employed. Although the two treatments (behavioural versus cognitive) were equally effective, both treatments were significantly more effective than the wait-list control in reducing total PSQ and EEF scores.

In another study conducted by Rayburn, Richmond, and Rogers, (1982, 1983) a small group of clergy was studied and found to have significantly lower total ORQ, (especially 'Role Insufficiency and Responsibility scores) than the normative sample. Clergy in this sample also reported significantly less Vocational Strain and Physical Strain, and significantly more Social Support, than the normal sample.

Forney and Wiggers, (1984) administered the OSI and an author-constructed burnout inventory to 146 career development professionals. The respondents scored lower than the norm sample on all of the ORQ and PSQ scales except Role Overload. Respondents also reported significantly greater Social Support.

Forney (1982) reported no significant differences in the same sex sample. Pelletier, (1983) administered the OSI to a small sample of directors of career

The Psychological Strain Domain is measured by four subscales collectively called The Personal Strain Questionnaire (PSQ).

The Personal Strain Questionnaire scales are:

1. Vocational Strain (VS): This measures the extent to which the individual is having problems in work quality or output. Attitudes toward work are also measured.
2. Psychological Strain (PSY): This measures the extent of psychological and/ or emotional problems being experienced by the individual.
3. Interpersonal Strain(IS): This measures the extent of disruption in interpersonal relationships.
4. Physical Strain: This measures complaints about physical illness or poor self-care habits.

Coping Resources Domain is measured by four subscales collectively called the Personal Resources Questionnaire (PRQ)

Personal Resources Questionnaire (PRQ) scales are:

1. Recreation (RE) measures the extent to which the individual makes use of and derives pleasure and relaxation from regular recreational activities.
2. Self-care (SC): measures the extent to which the individual regularly engages in personal activities, which reduce or alleviate chronic stress.
3. Social Support (SS): measures the extent to which the individual feels support and help from those around him/her.
3. Rational/Cognitive Coping (RC): measures the extent to which the individual possesses and uses cognitive skills in the face of work-related stresses.

Items are written at the 7th grade reading level equivalent to the General Certificate Examination Ordinary Level (GCE O'level), and takes 20–40 minutes to complete.

Interpretation Guidelines for the Occupational Stress Inventory

High scores for the ORQ and PSQ suggest significant levels of occupational stress and psychological strain. Scores above a T-score of 70 occurred only approximately 2% of the time within the normative sample, scores at or above 70 are statistically significant statistically and suggest a strong probability of maladaptive stress. Scores in the range of 60-69 are not as significant statistically, but do suggest mild levels of mal adaptive stress. Scores in the range of 40-59 are within a standard deviation of the mean and should be interpreted as being within normal ranges. Scores below 40 indicate a relative absence of occupational stress and psychological strain.

When high scores occur on the PRQ scales there is an indication of highly developed coping resources. Scores at or below a T-score of 30 are indicative of a significant lack of coping resources. Scores in the range of 30-39 suggest mild deficits in coping skills. Scores in the range of 40-59 indicate average resources, while higher scores indicate increasingly strong coping resources.

The Stress Symptom Inventory (SSI)

This is a Likert scale(Tubesing and Tubesing, 1983). Subjects are able to indicate what symptoms they have experienced in the last six months at work and to indicate whether they have had to go to hospital for treatment of those symptoms.

Internal Consistency, Validity and Reliability of the Stress Symptom Inventory

Johnson and Siegel (1978) reported an internal consistency of .77 and a validity of .93 when normed on 1,884 men and 703 women. Blair et al (1976) reported test-retest reliability for total scores over a twelve 12-month period of .61 and .52

CHAPTER FOUR

METHODOLOGY

The design of the study was a corelational study of occupational stress and its relationship to health.

Participants

Four hundred and sixteen working males and females employed in various professional categories participated in this study. All the participants were Ghanaian nationals.

The participants were employed in positions which were either managerial or non- managerial in nature. They all had achieved a minimum educational level of equal or comparative standing with the General Certificate of Education Ordinary Level G.C.E O' Level). All the participants worked in government institutions.

For the purpose of maintaining confidentiality and in order that the results of this research cannot be used by the employees against their employers resulting in unpleasant difficulties, the identity of the Institutions were all coded and not disclosed. These institutions were all located in the capital city of Accra, in Ghana, West Africa.

The list included the security services, banking institutions, hospitals and other private organisations. All the institutions employed a minimum of two thousand workers. Of the 416 participants in the study 71 (17%) were female and the remainder 345 (83%) were male. Some of the participants were not comfortable in reporting their actual ages, and only 283 (68%) reported their

ages out of this 61(21.6%) were female and 222(78.4%) were males. There was an age range between 24 and 51 years of age. The mean age of all participants was 38.81(SD 7.03). Approximately 222 were male (39.25%, the mean age was m=39.25 (SD 7.00) and that of the 61 (37%) females was m=37.21(SD 6.69).

A total of 307(74%) participants were in managerial positions, while 109(26%) were in non-managerial positions. Of these 241(m=1.69,SD .46) men were in managerial position, and 104 (95.41%) men were not.

A total of 66 (m=1.79, SD .41) females were in managerial positions and 5 (5%) were not.

Procedure

The participants were recruited through making contact with their various institutions. The institutions were approached for permission to recruit interested individuals. Introductory letters were used **(See Appendix 1.1 & 1.2).**

The Administrative Officers of the various institutions then distributed the questionnaires to the various employees who met the requirements of this research. There were no benefits/rewards for participants, except for a thank you letter. **(See Appendix 1.3).**

All instructions regarding the research were individually explained to the participants by the researcher. Participants were made to appreciate the need for honest responses.

Additionally, participants were assured of the confidentiality of the survey, and they were not allowed to write their names on the answer sheets. All the

Institutions and or participants had the right to withdraw from the study at any time should they wish to do so. Also they had the right to request the results of the research following analyses of the data. All of the Security Agencies made this request.

Materials

A) The test administered included the Occupational Stress Inventory-Research Version by Osipow and Spokane(1992) an eight-page item booklet which is divided into three main sections. The first page of the item booklet contains instructions for the respondents. The three sections of the inventory yields to the three domains which were —the Occupational Role Questionnaire (ORQ) which comprises a total of six sub-scales scales, 10 items for each scale totalling 60 items, The Personal Strain Questionnaire (PSQ), which has four sub-scales with 10 items per scale, totalling forty items, and the Personal Resources Questionnaire (PRQ) which has four scales with 10 items per scale, totalling forty items.

B) The Stress Symptom Inventory and number of visits to hospital. This is a 39-item inventory developed by Johnson and Siegal, 1978. **(Appendix 3.1).**

C). A rating sheet for the Occupational Stress Inventory **(Appendix 2.5).**

D). A pencil and an eraser.

Administration of the Measures

The participants were invited into a quiet room for the period it took to complete the questionnaire. The instructions in the item booklet were

reviewed with each participant to ensure that the participants understood the procedure and the response options **(Appendix 2.1).**

The Occupational Stress Inventory took approximately 20 to 40 minutes and the Stress Symptom Inventory 5 to 10 minutes. The participants answered the Occupational Stress Inventory first then answered the Stress Symptom immediately afterwards. Most participants took 30 to 45 minutes to complete the two Inventories. The participants start by providing demographic information on the rating sheet, which included age, sex and occupation.

Scoring of the Measures

The rating sheet of the Occupational Stress Inventory is scored by removing the top page of the rating sheet after tearing away the perforation at the top and bottom of the sheet. The bottom page of the rating sheet provides scores for the ratings for each item for each of the scalès. The direction of scoring is not the same for all the items- some items are reverse-scored (i.e., a rating of "never" produces a score of "1" on some items and "5" on other items) **(Appendix 2.5).** The scores for each column were totalled and entered in the space provided at the bottom of the column. These totals constituted the raw scores for each of the scales. The raw scores were then transferred to the profile form **(Appendices 2.6/2.7)** to facilitate calculation of T-scores. The appropriate side of the profile form (Male or Female) was used depending on the sex of the respondent. The raw scores for each scale was entered along the bottom of the profile form in the space provided. The raw scores for each scale was then plotted on the vertical column above each raw score. The

T-scores were identified by referencing the columns at the left and right of the profile form and then recorded. The Stress Symptom Inventory was scored by adding the number of responses selected. The total scores were then recorded.

Interpretation of the Occupational Stress Inventory Scores

The interpretation of the scores of the Occupational Stress Inventory is done by using the normative samples(percentiles and T-scores). T-scores are non-normalized linear transformations of the raw scores and have a mean of 50 and a standard deviation of 10. T-scores based on the normative sample are also easily obtained by plotting raw scores on the profile forms for male and female respectively **(Appendices 2.7 and 2.8).** To the left and right of the profile forms are the equivalent T-scores for raw scores for each scale. High scores for the Occupational Role Questionnaire and Personal Strain Questionnaire suggest significant levels of occupational stress and psychological strain.

Scores above a T-score of 70 occurred in approximately 2% of the time within the normative sample, scores at or above 70 are statistically significant and suggest a strong probability of maladaptive stress.

Scores in the range of 60-69 are not as significant statistically, but do suggest mild levels of mal adaptive stress.

Scores in the range of 40-59 are within a standard deviation of the mean and should be interpreted as being within normal ranges.

Scores below 40 indicate a relative absence of occupational stress and psychological strain.

When high scores occur on the Personal Resources Questionnaire scales there is an indication of highly developed coping resources. Scores at or below a T-score of 30 are indicative of a significant lack of coping resources. Scores in the range of 30-39 suggest mild deficits in coping skills.

Scores in the range of 40-59 indicate average resources, while higher scores indicate increasingly strong coping resources.

Analysis of the average level of elevation for each set of scales provides a general profile of dynamics of the individual's psychological status in the workplace. Individuals with high average elevations on the Occupational Role Questionnaire and the Personal Strain Questionnaire scales and a low average elevations on the Personal Resources Questionnaire Scales are very likely to be experiencing significant psychological distress.

Average elevations for the three sets of scales provides a detail view of each of the domains and allow a more exact analysis of operating stresses, strains, and resources for each individual. Interpretation guidelines are given in **Appendix 2.9**.

CHAPTER FIVE

RESULTS

The mean scores and the standard deviations of the sub-scales of the Occupational Stress Inventory (OSI), the Stress Symptom Inventory (SSI), and the number of visits to hospital for males, females, managers and Non managers are shown in **(Appendix 4-Tables1a. 1b and 1c).** There was no significant difference between males and females on the measures used in this study, neither was there a significant difference between managers and non managers.

Pearson r was computed to establish the relationship among the Domains of the Occupational Stress Inventory (OSI), which are the Occupational Role Domain (ORQ), the Personal Strain Domain (PSQ) and the Personal Resources Domain (PRQ) and their subscales. Pearson r was also computed to establish the relationship between the Occupational Stress Inventory, Role Level, the Stress Symptom Inventory and the number of Visits to hospital for the treatment of Stress related symptoms. The results are shown in **Appendix 5-Table 1.**

The Domains of the Occupational Stress Inventory, the Stress Symptom Inventory, Role Levels and the number of Visits to Hospital for Stress related Symptoms

The Pearson r was computed to show the relationship between the three domains of the Occupational Stress Inventory, the Occupational Role Domain (ORQ), the Personal Strain Domain (PSQ) and the Personal Resources

Domain (PRQ) and Role Levels with the number of Visits to hospital for treatment of stress related symptoms and the role levels. The results are shown in **Table 1.** The results showed that the participants did show personal strain and did go to hospital for the treatment of stress related symptoms. Their role level did not matter and their personal coping resources had failed them.

Table 1.

Correlation between the Occupational stress, Personal strain, Personal Resources Domains and Role Levels with the number of Visits to hospital for Stress related symptoms.

	PRQ	PSQ	No. OF VISITS	STRESS SYMPTOMS	ROLE LEVEL
ORQ	.090	.578**	.488**	.509**	-024

*Note significant level = p<0.01

The Occupational Role Domain

The relationship between the Occupational Role Domain (ORQ) and all of its six sub-scales, Physical Enviroment (PE), Responsibility (R), Role Ambiguity (RA), Role Boundary (RB), Role Insufficiency (RI), and Role Overload (RO) were significant as shown in **Table 2.** The results clearly showed that the six variables measured on the occupational role scales did have an effect on the occupational stress experienced by the participants.

Table 2.

Correlation between the Occupational Role Domain and its six sub-scales

	PE	R	RA	RB	RI	RO
ORQ	.713**	.588**	.732**	.785**	.671**	.681**

*Note significant level = p<0.01

There was also a significant relationship between the Occupational Role Domain(ORQ) and the four sub-scales of the Personal Strain Domain(PSQ) these were Interpersonal Strain(IS) r = .477; p<0.01, Physical Strain(PHS) r = .477; p<0.01, Psychological Strain(PSY) r = .554; p<0.01, Vocational strain(VS) r = .537; p<0.01 **(Appendix 5-Table 2).** The participants did show significant personal strain as a result of their occupational roles.

The relationship with two of the sub-scales of the Personal Resources Domain was also significant: Recreation(R) r = .130; p<0.01 and Self Care(SC) r = .160; p< 0.01**(Appendix 5-Table 2).** The participants relied on recreation and self care as their key coping resources.

The Personal Strain Domain

The relationship between the Personal Strain Domain (PSQ) and three of its sub-scales was found to be significant as shown in **Table 3.** These were Interpersonal Strain (IS), Physical Strain (PS), and Vocational Strain (VS).

Table 3.

Correlation between the Personal Strain Domain and its sub-scales.

	IS	PHS	VS
PSQ	.865**	.864**	.802**

***Note significant level p<0.01**

The relationship between the Personal Strain Domain(PSQ) and the six sub-scales of the Occupational Role Domain(ORQ) was significant, Physical Enviroment(PE) r = .514; p< 0.01, Responsibility(R) r = .310; p<0.01, Rational/Cognitive Coping(RC) r = .382; p<0.01,

Role Boundary(RB) r = .497; p<0.01, Role Insufficiency(RI) r = .333; p<0.01, Role Overload(RO) r = .372; p<0.01 **(Appendix 5-Table 3).**

Again the relationship between the Personal Strain Domain(PSQ) and the Personal Resources Domain(PRQ) r = .272; p<0.01 and two of it's sub-scales Self Care(SC) r = .296; p<0.01 and Social Support(SS) r = .108; p<0.01**(Appendix 5-Table 3).**

The Personal Resources Domain

Three out of the four sub-scales of the Personal Resources Domain (PRQ) which included Recreation (RE), Rational /Cognitive thinking (RC), and Self Care (SC) had a significant relationship with the Personal Resources Domain(PRQ) as shown in **Table 4.**

Table 4.

Correlation between the Personal Resources Domain and its sub-scales.

	RE	RC	SC
PRQ	.748**	.880**	.829**

*Note significant level p<0.01

There was also a significant relationship with all four scales of the Personal Strain Domain(PSQ) which are Interpersonal Strain(IS) r = .330; p<0.01, Physical Strain(PS) r = .190; p<0.01, Psychological Strain(PSY) r = .229; p<0.01 and Vocational Strain(VS) r = .185; p<0.01(**Appendix 5-Table 4).**

Stress Symptom Inventory

The Pearson r was computed to establish the relationship between the Stress Symptom Inventory (SSI) and the three domains of the Occupational Stress Inventory and each of their sub-scales.

Stress Symptom Inventory and the Occupational Role Domain

There was a significant relationship between the Stress Symptom Inventory and the Occupational Role Domain (ORQ) and all of it's sub-scales as shown in **Table 5.**

The sub-scales were Physical Enviroment (PE), Responsibility (R), Role Ambiguity (RA), Role Boundary (RB), Role Insufficiency (RI) and Role Overload (RO).

Table 5.

Correlation between the Stress Symptom Inventory and the Occupation Role Domain.

	ORQ	PE	R	RA	RB	RI	RO
SSI	.509**	.400**	.165**	.435**	.456**	.363**	.305**

Note significance level p<0.01

Stress Symptom Inventory and the Personal Strain Domain

The significance of the relationship between the Stress Symptom Inventory (SSI) and the Personal Strain Domain (PRQ) and it's four sub-scales is shown in **Table 6.** The sub-scales were Interpersonal Strain (IS), Physical Strain(PS) r = .527, p<0.01; Psychological Strain (PSY) r = .553, p<0.01; and Vocational Strain (VS) r = .500, p<0.01.

Table 6.

Correlation between the Stress Symptom Inventory and the Personal Strain Domain.

	PSQ	IS	PS	PSY	VS
SSI	.607**	.506**	.527**	.553**	.500**

Note significant levels p<0.01

Stress Symptom Inventory and the Personal Resources Domain

There was also a significant relationship between the Stress Symptom Inventory (SSI) the Personal Resources Domain (PSQ) and three of its four

sub-scales as shown in the **Table 7.** The three sub-scales are Recreation(R), Self Care (SC) and Social Support (SS).

Table 7.

Correlation between the Stress Symptom Inventory and the Personal Resources Domain.

	PRQ	R	SC	SS
SSI	-.209**	-.191**	-.144**	-.272**

Note significant levels p<0.01

Stress Symptom Inventory and Visits to hospital for treatment of Stress related Symptoms.

The relationship with the visits to hospital for treatment of stress related symptoms was also significant r = .607; p<0.01.

Visits to hospital for treatment of Stress related Symptoms

The number of visits to hospital for stress related symptoms had a significant relationship with all the three Domains of the Occupational Stress Inventory, and their sub-scales. These are shown in the Tables below.

Table 8 Shows the co-relationship between the number of visits to hospital for treatment of Stress related Symptoms and the Occupational Role Domain (ORQ), and it's six sub-scales, which include Physical Enviroment (PE), Responsibility (R), Role Ambiguity (RA), Role Boundary (RB), Role Insufficiency (RI) and Role Overload (RO).

Table 8.

Correlation between Visits to hospital and the Occupational Role Domain.

	ORQ	PE	R	RA	RB	RI	RO
VISITS TO HOSP.	.488**	.365**	.145**	.424**	.431**	.365**	.315**

*Note significant levels p<0.01

Table 9 shows the significance of the relationship between the Visits to hospital for treatment of Stress related Symptoms and the Personal Strain Domain(PSQ) and its four sub-scales. These were Interpersonal Strain (IS), Physical Strain (PS), Psychological Strain (PSY) and Vocational Strain (VS).

Table 9.

Correlation between Visits to hospital the Personal Strain Domain and its subscales

	PSQ	IS	PS	PSY	VS
VISITS TO HOSPITAL	575**	.477**	.509**	.529**	.406**

Note significant levels p<0.01

Table 10 shows the co-relationship between the number of visits to hospital for treatment of Stress related Symptoms and the Personal Resource Domain

(PRQ) and three of its sub-scales. The sub-scales are Rational/Cognitive Coping (RC), Self Care (SC) and Social Support (SS).

Table 10.

Correlation between Visits to hospital and the Personal Resources Domain and its subscales

	PRQ	RC	SC	SS
VISITS TO HOSPITAL	-.215**	-.191**	-.157**	-.279**

Note significant levels p<0.01

Role Level

The role level did not have any significant relationship with any of the five dependant measures. There was a significant relationship however with Interpersonal Strain r = 121; p<0.01 which is one of the subs-scales of the Personal Strain Questionnaire(PSQ) results are shown in **Table 11**.

Table 11.

Correlation between Role Level, the Occupational Role, Personal Strain, and Personal Resources Domains and the number of visits to Hospital for the treatment of Stress Related Symptoms

	ORQ	PRQ	PSQ	NO. OF VISITS	STRESS RELATED SYMPTOMS
ROLE LEVEL	-.024	-.033	.062	.006	.029

Note significant levels $p<0.01$

Social Class

Social class had a significant relationship with Rôle level $r= .524; p<0.01$. It did not have a significant relationship with any of the other dependant measures except for Self-care(SC) $r= .128; <0.01$ which is one of the subscales of the Personal Resources Questionnaire. **Table 12** show the relationship between social class the occupational stress, Personal Resources and Personal strain Domains as well as that between it and the number of visits for the treatment of stress related symptoms.

Table 12.

Correlation between Social Class the Occupational Stress, Personal Resources and Personal Strain Domains and the number of visits to hospital for the treatment of stress related symptoms.

	ORQ	PRQ	PSQ	NO. OF VISITS	STRESS RELATED SYMPTOMS	ROLE LEVEL
SOCIAL CLASS	.015	.070	.057	-.024	-.036	.524**

Note significant levels p<0.01

Sex

The Pearson r was use to computed for all participants irrespective of their sex. There was no significant relationship between sex and any of the dependant measures see **Table 13**.

Table 13.

Correlation between Sex, the Occupational Stress, Personal Resources and Personal Strain Domains and the number of visits to hospital for the treatment of stress related symptoms.

	ORQ	PRQ	PSQ	NO. OF VISITS	STRESS SYMPTOMS	ROLELEVEL
Sex	-.044	-.031	-.057	.073	.065	-.090

Note significant levels p<0.01

Age

Age was computed for the 283(68%) of the participants who gave their ages. There was no significant relationship with any of the dependant variables as shown in **Table 14**.

Table 14.

Correlation between Age and the Occupational Role, Personal Resources, and Personal Strain Domains and the number of visits to hospital for treatment of Stress Related Symptoms.

	ORQ	PRQ	PSQ	NO. OF VISITS	STRESS RELATED SYMPTOMS	ROLE LEVEL
AGE	.013	.034	-.038	.003	-.012	-.203**

Note significant levels p<0.01

Normative Data

The converted T scores collected by Osipow and Spokane (1985) for males and females are shown in **Appendix 6, Tables 1 and 2** respectively.

The overall correlations between each of the domains of the Occupational Stress Inventory for the Ghanaian study are shown in **Appendix 5-Table 1.**

The T- scores for the Ghanaian participants of the study are shown in **Appendix 6-Table 3.**

CHAPTER SIX

DISCUSSION

The primary objective of this study was to determine if occupational stress did exist within the Ghanaian working population by measuring it, and whether it had any relationship with the health of the participating workers. This has become necessary since several working people are noted to report to hospital with symptoms of diseases for which no organic cause can be found. It is increasingly being suspected that some of these diseases are being caused by stress. Secondly the study aimed at collecting Ghanaian normative data for the Occupational Stress Inventory (OSI), a measure which could ultimately be used within the Ghanaian population. Thirdly the study aimed at determining if there were any differences in the measure of occupational stress experienced by managers and non- managers. Four major hypotheses were formulated and tested.

Major findings

The results of this study clearly showed that Occupational Stress does exist within the working population in Ghana. There was no difference in the measure of this stress between Managers and non- managers. The Occupational Stress was linked to their health and this was evident by the greater number of visits to hospital for the treatment of stress related symptoms reported by those who also reported higher levels of occupational stress.

The T-scores collected for the Ghanaian population were similar to those collected by Osipow and Spokane. The cultural flexibility of the Occupational

Stress Inventory however was not confirmed since culturally relevant items were not included in this study .

Stress- Occupational and Personal

The analyses of the two Domains of the Occupational Stress Inventory measuring stress (Occupational Roles Questionnaire and the Personal Strain Questionnaire) showed that Occupational and Personal Stress was experienced by all of the participants of this study irrespective of role level. This supports the first hypothesis that occupational stress exists in all levels of workers be they managers or non-managers. The results further revealed very high scores on the Occupational Roles Questionnaire for Physical Enviroment, Role Ambiguity, Role Insufficiency and Role Overload. The interpretation of high scores for these domains as given by Osipow and Spokane, (1992) is that the working environments maybe particularly stressful and that work schedules are erratic leaving them feeling isolated. The Participants may also be experiencing a poor sense of what to do, with conflicting demands from their supervisors. Participants may have a poor fit between their skills and the job they are performing. Their careers may not be progressing with little hope for the future. Their workloads may also be increasing, unreasonable, and unsupported by needed resources

These results support previous studies (Brown, Bond, & Prentice, 1985; Brown et al., 1986a; Brown et al., 1986b). Brown et al. drew a stratified random sample (N=268) of faculty and students affairs staff who completed the Occupational Role Questionnaire, Personal Strain Questionnaire and Personal Role Questionnaire. Sub samples were taken at three times during the spring academic semester (early January; early March; early April). The

results revealed significant main effects for all three independent variables. For campus role, faculty was significantly higher than students on Role Over load, Responsibility, and Role Insufficiency. These researchers also coded faculty disciplines using Biglan's, (1973) three-factor scheme (Hard versus Soft; Pure versus Applied; Life versus Non-life). Analyses of Occupational Stress Inventory scale scores revealed that faculty in Pure-Life subjects reported less Role Overload than those in Pure-Non life areas, whereas Applied-life faculty reported more Role Overload than their Applied Non-life peers. Hard-life faculty reported Physical Enviroment stress than Soft-life faculty, as might be expected given the nature of their disciplines. Major stresses reported in open-ended questions for the faculty and student affairs group included time pressures, work overload, and interpersonal relationships.

The scores for the Personal Strain Questionnaire were very high on Physical Strain, Psychological Strain and Vocational Strain. Osipow and Spokane, (1992) interpreted these findings as frequent worries about their health as well as a number of physical symptoms (colds, heart palpitations, aches and pains, stomach aches, and erratic habits). Scores may also suggest feeling depressed, anxious, unhappy, and/or irritable. High scores may indicate poor attitudes toward their work, including dread, boredom and lack of interest. There may be errors in their work or having accidents. The quality of their work may be suffering, with concentrating problems and absenteeism in evidence.

Occupational Stress and Sex

The second hypothesis that differences will be found between male and female workers was not supported by the findings of this study. The number of female participants 71(17.7%) in the study was too few to do any meaningful full analyses however the trend of the data collected showed that there were no differences between males and females of the study. This has been supported by Osipow, Doty, and Spokane (1985) who have studied the relationship between the Occupational Stress Inventory and sex found that gender was not a significant factor in any of the analyses. However Brown et al (1985,1986) in their study showed that women had significantly higher total Personal Strain Questionnaire scores than men. (Brown, Bond, & Prentice, 1985; Brown et al., 1986a; Brown et al., 1986b).

Occupational Stress, Social Class and Age

The third hypothesis of the study was to determine if there was a significant relationship between the Occupational Stress, role level, sex, social class, and age. The findings of the study with regards to role level and sex which did not have a significant relationship with Occupational stress, or age have already been discussed. The study showed that social class made no difference to the measure of Occupational Stress or health related symptoms however the study did show that those in a higher Role Level had a higher social class.

Age was only computed for the 283(68%) participants who gave their ages. It was not too surprising that some participants did not give their ages since most Ghanaians do not feel too comfortable letting others know how old they

are. The results showed that age did not have any significance with Occupational stress, Personal strain or Personal Coping. Also it also did not have any significant relationship with the stress symptoms suffered or the number of times for which they sought treatment. Age on the other hand had a negative relationship with role level implying that those who had a higher role level were older. The third hypothesis was therefore rejected since all the participants experienced occupational stress, irrespective of their role level, social class and age.

Osipow, Doty, and Spokane, (1985) studied the relationship between age and Occupational Stress Inventory scores among 310 employed adults. A multivariate analysis revealed main effects for age on Occupational Role Questionnaire and Personal Role Questionnaire scores. Older respondents generally reported more Role Over load and Responsibility and less Insufficiency, Boundary, and Physical Enviroment stress than their younger counterparts. A trend was found for lower Personal Strain Questionnaire, and higher Personal Resources Questionnaire, scale scores with increasing age. The authors postulated that the older workers, even though faced with the same stresses as younger workers, might even have learnt to make better use of coping resources and thereby reduce strain.

Stress and Personal Resources (Coping)

The study found that Occupational Stress and Personal Strain were linked and this did not depend on their role level. The personal resources of the participants had no significant relationship the occupational stress that they were experiencing. The hypothesis (4a) which suggested that Occupational

stress, Personal Strain And Personal Stress were linked could not be completely supported. It was evident that as Occupational Stress increases so does their Personal Strain but the participants could not rely on their Personal Resources in order to relieve their stress. The results also show that the participants scored highly on Personal Resources such as Recreation, Self-care, their Rational and Cognitive thinking, the participants did not score too highly when it came to dealing with their Personal Strain, their scores on Self care and Social Support were low. This suggest that while they thought that they had Personal Resources in place such as Self-Care and Social Support these methods were not actually effective in dealing with their personal strains.

An analyses of the results therefore suggest that these methods are either being inappropriately or in adequately used to deal with the occupational stress and strain that the participants are experiencing this conclusion is supported by the significance of the low scores on Recreation and Self-care when Occupational Stress was correlated with Personal Resources. This may further suggest that the recreational/leisure time provided for them is either inadequate or not effectively used.

The hypothesis (4b) which suggested that different coping mechanism will be found between managers and nonmanagers was rejected this was because role level was not of any significance. The results did show however that all participants did pay more attention to Self care as a personal resource. The results suggest that Self care was the major Personal Resource that was use by the participants to deal with both Occupational Stress and Personal Strain.

In similar studies other researchers such as Brown, et al. studying stress on a college campus reported that all subjects dropped in Self-care from the beginning to the end of the semester. (Brown, Bond, & Prentice, 1985; Brown et al., 1986a; Brown et al., 1986b). A recent field study also done by (Osipow & Davis, 1994) tested the Occupational Stress Inventory model by determining the unique contributions of the individual Occupational Role Questionnaire and Personal Role Questionnaire scales on the Personal Strain Questionnaire. In a complex analysis of veterinary medical student's responses, the moderating effects of individual coping variables were partialed out of the stress/strain relationship. A number of coping moderators significantly buffered the relationship between stress and strain, revealing an interesting pattern of results. Osipow and Davis concluded that Self-care was the predominant coping mechanism, buffering the effects of both Responsibility and Physical Environment on the Psychological Strain, and buffering the effects of Role Ambiguity, Role Boundary, and Responsibility on Interpersonal Strain. The next most effective coping mechanism was Social Support, which buffered the relationship between Role Boundary and Interpersonal or Physical Strain. Again, no significant sex differences were found. The authors argued that the coping strategies currently employed by these respondents were not particularly effective in reducing strain. The authors suggested training in effective coping as a potential remedy.

However researchers such as Rayburn, Richmond, and Rogers, (1982, 1983) who studied a small group of clergy and found them to have significantly lower total Occupational Role Questionnaire, and especially Role Insufficiency and Responsibility, scores than the normative sample. Clergy in this sample also

reported significantly less Vocational Strain and Physical Strain, and significantly more Social Support than the norm sample. Forney and Wiggers, (1984) administered the Occupational Stress Inventory and an author-constructed burnout inventory to 146 career development professionals. The respondents scored lower than the norm sample on the entire Occupational Role Questionnaire and Personal Strain Questionnaire scales expect Role Overload. Respondents also reported significantly greater Social Support. Forney (1982) reported no significant sex differences in the same sample. Similarly, Pelletier, (1983) administered the Occupational Stress Inventory to a small sample of directors of career centres and found low stress and strain and high levels of coping resources.

Occupational Stress and Health

The fifth hypothesis of this study was divided into two parts the first was to determine if occupational stress and health were linked (5a) and the second stated that differences would be found between managers and non managers (5b). The first half of the hypothesis was accepted (5a). The study did prove that occupational stress and health were linked.

The second half of the hypothesis(5b) was rejected. Role level did not have any significance it therefore did not matter whether the participant was a manager or not. It was however noted that all participants suffered more interpersonal strain. This may be because as workers they spend a lot of time dealing with other people's problems and as a result they suffered a greater extent of disruption in their own Interpersonal Relationships. The results also showed that workers with more Responsibility were found to

experience more Physical Strain. The results showed that they had more complaints about physical illness, probably practicing poor Self-care habits. The results also showed that there was a link between Occupational Stress, Personal Strain and visits to hospital for treatment of health symptoms that the Participants presented. The more the Occupational stress and personal strain, the more stress symptoms and the more visits were made to hosipital. The results also showed that the greater a person's personal resource the fewer the stress symptoms, and the fewer the visits made to hospital.

The significance of the relationship between the Stress Symptom Inventory and factors in the workplace that cause Occupational Stress and Personal Strain, is an indication that the stress that they experience does affect their health. The significance of this relationship is stronger with the Personal Strain Questionnaire reflecting how much the stress is affecting the Participants. The significant of the negative relationship with the Personal Resources Questionnaire is an indication that the Resources that the Participants are relying on such as Recreation, Self Care and Social Support are not effective or useful or insignificant. There would therefore be a need to introduce better coping mechanisms to deal with the stresses that are being experienced.

There would therefore be a need to provide better recreational facilities at work which the workers could make use of. They should be encouraged to do things that they do enjoy in their spare time. Workers should also be allowed to develop a more systematic method of solving their problems. Coping methods should be taught to workers and stress management techniques should be taught. Workers should be encouraged to forget work once they are

at home. They should also make use of available Social Support both at home and at the work place. This is supported by Brown et al, who studied college students reported that their subjects reported bodily signals and poor interpersonal relationships as primary indicators of their own stress, and reported that taking some specific action and increasing exercise were their preferred coping strategies. (Brown, Bond, & Prentice, 1985; Brown et al., 1986a; Brown et al., 1986b).

Implications of the study

The WHO Expert Committee on Health Monitoring in Occupational Health (147), stated that: Occupational Health Programs should aim—(among other things)-'to ensure that the physical and mental demands imposed on people at work by their respective jobs are properly matched with their individual anatomical, physiological capabilities, needs and limitations.'(WHO, 1985).

To meet this realisation physical work is usually associated with an improvement in physical capacity, while goal achievement and self-realisation in work are a source of satisfaction and enhanced self-esteem.

The findings of this research that occupational stress not only exist but has a direct relationship to the personal strain of the individual and subsequently to their health is a clear indication that there is a need to do more research in the area of occupational stress. This need is urgent in order not only to improve the health of all workers in the work force but also ultimately to increase productivity.

In order to explain the mechanism by which psychosocial work conditions may have an impact on health it is essential that information is gathered about the

way workers perceive the conditions at work. It is also important to remember that personal characteristics and other environmental and socio-cultural factors usually play a role as risk factors for these diseases. It is clear from this research that the work enviroment and its characteristics can play a role in the development of diseases resulting in a complex multiple aetiology.

One method of detecting work related stress is to have periodic examinations during which the occupational health physician and his staff look for any significant behavioural changes and or psychological psychosomatic disorders. Evidence of such a change would lead them to investigate the worker's personal history and the possible causative factors at work and else where. Even if it constitutes an increasing demand on the health and social services, special attention should be given to such complaints if they are not to be developed into major psychogenic or behavioural disorders. A program for monitoring the working enviroment and health of the workers for psychosocial factors is also a must. There is the need to develop the appropriate methodology for understanding this essential type of monitoring and provide a basis for decision-making and action.

Many of the adverse psychological factors in the work enviroment can be controlled through appropriate exhortation and interventions. Reductions in adverse psychological factors in the work settings serve to protect workers health and well being but such steps alone cannot fully eliminate stress. Health promotion programs are required to heighten knowledge and awareness of stress and train workers in coping skills (WHO, 1988).

Research has identified that participation in stress management programs are associated with reduced anxiety and depression, less frequent health

complaints and sleep disturbances, reduced blood pressure, muscle tension and levels of circulating stress hormones. Workers commonly report improvement in their ability to cope with stress after training and there are indications that health clinic visits and health care cost decrease (WHO, 1988).

Many African countries are yet to integrate their health care programs at the primary secondary and tertiary levels. Such integration has already been effected in the United States of America, Britain, in parts of Europe and also Cuba, where public health psychology forms part of the public health program. However, voluntary organisations, medical service providers, community physicians, universities, religious organisations and local governments can assist health promotion in the work place by providing relevant information, conducting evaluations giving advise on the design and evaluations of health promotion programs and training workers to conduct such programs.

Benefit to Ghanaian Workers

Even though the study was limited to only a cross section of the Ghanaian urban Working population the findings give an indication of what one would find should the entire Ghanaian population participate in such a study. There is an urgent need for a more serious view of occupational stress to be taken and for its evaluation. This need is urgent since Government and the Individuals concerned spend a lot of time and scarce resources diagnosing and managing/treating the many ailments and the psycho-physiological diseases in particular that may be due to occupational stress. Dealing with the

stress in the work place and providing the right type of treatment will not only be cheaper but will improve productivity.

Several workers are aware that they are exposed and are suffering from occupational stress. However results from the Personal Resources Domain of the study indicates that they are making use of coping mechanisms that are either failing them or are used ineffectively. A more in-depth study of the coping resources that individuals are making use of, will provide some information for health workers. This will enable both Institutions and health workers to respectively provide better recreational facilities and to design interventions that improve on available coping resources. The information on occupational stress will enable institutions to provide more worker friendly environments that will reduce the occupational stress that is experienced by their workers, without compromising their work standards.

An occupational stress scale can be used as a screening instrument for individuals with obvious signs of excessive strain. Valuable information on the roles that are producing the stress and their relative interrelationships can be made use of. Such information interpreted properly might help individuals to plan a strategy for altering these roles to adapt to induced stress and thereby reduce strain.

The information that a scale such as the occupational stress inventory provides will enable individuals to receive appropriate career counselling and guidance. An unhappy or highly strained employee may well need a career change to a better fitting position, or may need assistance in coping with stress to permit better adjustment to the work setting. Programs of employee

assistance and counselling in business and industry will also be useful and beneficial.

Evaluation of occupational stress does offer considerable potential for measuring the outcomes and establishing the effectiveness of various individual and organisational interventions designed to reduce stress and strain.

Finally and most importantly early and correct diagnosis of occupational stress will enable victims to receive early and appropriate treatment. The worker will definitely feel better and it will be at a cheaper cost to everybody concerned. Early identification of victims will be of assistance in determining patients who would benefit from treatment.

Shortcomings of the research

1. The research was limited to individuals who were employed in Government jobs only in an Urban setting.
2. The numbers of female participant were much fewer than males.
3. The research did not determine if the participants received satisfactory treatment for their stress symptoms.
4. The measuring instrument was not culturally sensitive. An instrument, which has more culturally accepted facets needs to be developed, or a modified version, of the one used which has incorporated culturally sensitive values should have been used.

Directions for future research

1. Further studies should be done to establish what exactly constitutes occupational stress for the Ghanaian population.
2. The kinds of coping mechanisms that workers make use of should be examined in depth
3. The effectiveness of medical interventions for stress related symptoms should be explored.
4. Studies should include workers in Government and non-Governmental employment.
5. More normative data should be collected within Africa.
6. Culturally accepted test should be developed and used.

CHAPTER SEVEN

CONCLUSION

Stress at work is the consequence of a combined exposure to a multitude of factors in the work enviroment and employment conditions (Kalimo, 1980) this stress is known as occupational stress. While most Western Societies have invested heavily into researching into occupational stress and its effects on workers very little has been done in the field in Ghana and other third world countries.

The aim of the research was to determine if occupational stress does indeed exist in Ghana and if there was any relationship with health. The research also set about collecting normative data for the Ghanaian population. The scales used were the Occupational Stress Inventory (OSI) developed by Osipow and Spokane (1994) and the Stress Symptom Inventory (SSI) which is a Likert scale.

Of the four hundred and sixteen participants who took part in the research, all of them were employed by various Govermental agencies. 307(73%) were in managerial positions while 109(26%) were in non-managerial positions. The research findings suggested that all the workers suffered from some degree of occupational stress and personal strain. However neither role level nor social class made a significant difference to the Occupational Stress and Personal Strain that they experienced. All the participants engaged in some form of coping strategy in order to cope with the stress that they felt.

The findings established that occupational stress does exist in Ghana and that the sufferers do experience personal strain with accompanying or related health consequences. It is for this reason that research into occupational

stress should be increased and broadened. Further research should include the development of a scale of measure that is sensitive and standardised for use on the Ghanaian population, which will provide valuable information, and early detection of occupational stress. Further research will no doubt go a long way to deal and alleviate the effects of occupational stress.

REFERENCES

Anum, A. (1998). A normative Study of the Raven's coloured progressive matrices among school children in Ghana. Unpublished master's dissertation, University of Ghana, Legon.

Alexander, D.E. (1983). Occupational stress, strain, and coping among family physicians training and teaching in military and civilian settings. Unpublished doctoral dissertation, Ohio State University, Columbus.

American Psychiatric Association (1987): Diagnostic and statistical manual of mental disorders. First edition, 1952; second edition, 1986; third edition, 1980; revised, 1978. Washington, DC: Author.

Anastasi, A. (1990). Psychological testing (6th ed.). New York: Macmillan.

Beehr, T.A. (1985a). 'Organizational Stress and employee effectiveness: a job characteristics approach', in T.A. Beehr and R.S. Bhagat (eds.), Human Stress and Cognition in Organizations. New York: John Wiley and Sons.

Biglan, A. (1973). The characteristics of subject matter in different academic areas. Journal of Applied Psychology, 57, 204-213.

Blair, M.G., Jones, R.S., and Simpson, R.H. (1976). Educational Psychology 4th Edition. NY: Macmillian Publishing Co.

Boadu, R.K (1998). Stress among middle level management and Junior workers of the textile industry in Ghana and Individual Coping Strategies. Unpublished Bachelor of Arts Long Essay. University of Ghana, Legon.

Brown, G.L., & Goodwin, F.K. (1986). Cerebrospinal fluid correlates of suicide Attempts and aggression. Annals of the New York Academy Of Science, 487, 175-188.

Brown, R.D., Bond, S.C., and Prentice, D.G. (1985, August). The Osipow-Spokane: Validity issues of an international stress measure. Paper presented at The annual meeting of the American Psychological Association, Los Angeles, CA.

Davidson, G. C. and Neal J. M. (1997). Abnormal Psychology. Revised 7th edition. New York: Wiley.

Danquah, S. A. (1882). The Practice of Behaviour Therapy in West Africa: The case of Ghana. Journal of Behviour Therapy and Experimental Psychiatry, 13,
5-13.

Edekor, N. E. B. (1998). Job stress and Coping; A comparative study among Supervisors in the Bank of Ghana and the Postal Service. Unpublished Bachelor of Arts Long Essay. University of Ghana, Legon.

Ezeilo, B.(1990). Psychology and Health in Africa: Social Science Medicine Vol. 31, No. 6, pp. 705-710.

Forney, D. S. (1982). Sex and age and the incidence of reported stress, strain, and burnout among career development professionals. Unpublished Master's thesis, University of Maryland, College Park.

Forney, D. S., and Wiggens, T.T. (1984). The saga continues: Stress, strain, and burnout among career development professionals. Journal of College Placement, 45, 34-39.

Friedman, M. (1969). Pathogenesis of coronary artery disease. New York: McGraw-Hill.

French, J.R.P. (1976 September). Job demands and worker health. Presented at the American Psychological Association Symposium, Washington, DC.

French, J. R. P. and Caplan, R.D. (1993). 'Organizational Stress and individual Strain', in A.J. Marrow (ed.), The failure of Success. New York:AMACON.

Hatch, M., Figa-Talamanca L, Salerno S. (1999). Work stress and menstrual patterns among American and Italian nurses. Scand J Work Health; 1999; 25(2): 144-150.

Hesse, A. I. F. (1998). Incidence of Hypertension in a Ghanaian prison. Ghana Medical journal. Vol 32a ISSM 0855-0328.

Higgens, N.(1986). Occupational stress and working women: The effectiveness of two stress-reduction programs. Journal of Vocational Behaviour, 29, 66-78.

Hokanson, J.E., and Burgen, M. (1962). The effects of the three types of aggression on vascular processes. Journal of Abnormal and Social Psychology, 65,
446-449.

Hokanson, J.E., Burgess, M., and Cohen, M.F. (1963). Effects of displaced aggression on systolic blood pressure. Journal of Abnormal and Social psychology, 67, 214-218.

Hokanson, J. E., Willers, K.R., and Koropsak, E (1968). Modification of autonomic responses during aggressive interchange. Journal of Personality, 36, 386-404.

Ivancevich, J. M. and Matteson, M. T.(1980). Stress and Work: A managerial perspective. Glenview, IL: Scott Foresman.

Kalimo, R. (1980). Stress in work. Conceptual analysis and a study on prison and health, 6 (Suppl. 3): 1-148.

Kalimo, R. (1986). Assessment of occupational stress: Psychological factors at work and their relation to health: Institute of Occupational Health, Helsinki, Finland.

Karasek, R. A. (1997). Job demands, job decision latitude, and mental strain: Implications for job redesign. Aministrative Science Quarterly, 24, 285-308.

Kasl, S. V., and Cobb, S. (1970). Blood pressure changes in changes in men undergoing job loss: A preliminary report. Psychomatic Medicine, 32, 19-38.

Kroll, H., Pyle, R., Zander, J., Martin, K., Lari, S., & Sines, L. (1981). Boaderline personality disorder: Interrater reliability of the diagnostic interview for borderlines. Schizophrenia Bulletin, 7, 269-272.

Lazarus, R. S. (1966). Psychological Stress and the coping process. New York: Ma-Graw-Hill.

Lazarus, R.B., Averill, J. R., Opton, E. M.,(1974). The psychology of coping: Issues of research and assessment. In G.V. Coehlo, D.A.Hamburg, & J.E. Adams (Eds.), Coping and adaptation (pp. 249-315). New York: Basic Books.

Lazarus, R.S., and Launier, L. (1978). 'Stress related transactions between person and enviroment, in L.A. Pervin and M. Lewis (eds), Internal and External Determinants of Behavior. New York: Plenum.

Lazarus, R.S., and Folkman, S. (1984). Stress, appraisal, and coping. New York: Springer.

Lehmer, M., & Bently, A. (1997): Treating work stress: an alternative to workers' compensation. J Occup Environ Med 1997 ; 39:63-7.

Maslach, C., and Jackson, S.E. (1986). MBI: Maslach Burnout Inventory, manual research edition. Palo Alto: University of California, Consulting Psychologists Press.

Mostapha A.(1987). The psychosocial health problems of workers in developing Multi-level random effects model. Annals of Behavioural Medicine,

Muntaner, C., Tien. A.Y. Eaton, W.W., Garrison, R (1991): Occupational characteristics and the occurrence of psychiatric disorders. Soc Psychiatry Psychiatry Epidermio 1991; 26: 273-83.

Newman, J. E., and Beer, T. A.(1979). Personal organizational strategies for handling job stress: A review of research and opinion. Personnel Psychology, 32, 1-44.

Nweze, A. (1984). Current developments in stress and illness research: a selected review in medicine and psychology, Nigerian J. clin. Psychol. 3,1-9.

Obrist, P.A., Gaebelein, C.J., Teller, E.S., Langer, A.W., Grignolo, A., Light, K. C.,and McCubbin, J. A. (1978). The relationship among heart rate, carotid dP/dt, and blood pressure in humans as a function of the type of stress. Psychophysiology, 15, 102-115.

Oshuntokin, B. O. (1988). Life styles and changes in patterns of non-communicable diseases in developing countries. Nigerian J. Basic Appl. Psychol. 1, 165-181, June 1988.

Osipow, S.H., and Davis, A.S (1994). The relationship of coping resourses to occupational stress and strain. Journal ov Vocational Behaviour.

Osipow,S.H., Doty R.E., and Spokane A.R. (1985). Occupational stress, strain, and coping across the life-span. Journal of Vocational Behaviour, 27, 98-108.

Osipow, S. H., and Spokane, A.R. (1981). Measures of Occupational Stress, Strain, and Coping (FormE-1). Columbus, OH: Marathon Consulting and Press.

Osipow, S. H., and Spokane, A.R. (1983). Manual for Measures of Occupational Stress, Strain, and Coping (Form E-2). Columbus,OH: Marathon Consulting and Press.

Osipow, S. H., and Spokane, A.R. (1992). Occupational Stress Inventory. Manual Research Version. Psychological Assessment Resources, Inc.

Pearlin, L. and Schooler, L. (1978). 'The structure of coping', Journal of Health and Social Behavior, 19: 2-21.

Pelletier, D.M. (1983). Career officers pass stress test. College Placement Council Spotlight, 6, (1-2), 98-108.

Pflanz, S. (1999). Psychiatric Illness and the workplace: Perspectives for Occupational Medicine in the Military. Military Medicine, Vol. 164.

Price, V. A. (1982). Type A behaviour pattern: A model for research and practice. New York: Academic Press.

Rayburn, C.A., Richmond, L.J.,and Rogers, L. (1982). Women, men, and religion: Stress within santuary walls Journal of Pastoral Counselling, 17, 75-83.

Rayburn, C.A., Richmond, L.J.,and Rogers, L.(1983). Stress among religious leaders. Thought, 58, 329-344.

Robbins, L.N., Helzer, J. E., Weissman, M.N., Orvaschel, H., Gruenburg, E., Burke, J.D., Regier, D.A.(1984).: Lifetime prevalence of specific psychiatric disorders in three cities. Arch Gen Psychiatry 1984; 41: 949-58.

Rosenman, R. H., Brand, R.J., Jenkins, C.D., Freidman, M., Straus, R., & Wurm, M., Straus, R., & Wurm, M. (1975). Coronary heart disease in the Western Collaborative Group Study: Final follow-up experience of 8 years. Journal of Ammerican Medical Association, 233, 872-877.

Roskies, E., & Lazarus, R.S.(1980). Coping theory and the teaching of coping skills. In P.O. Davidson & S.M. Davidson (Eds.), Behavioral Medicine: Changing health lifestyles (pp. 38-69). New York: Bruner Mazel.

Ross, R. R. and Altmaire, M. (1994). Intervention in Occupational Stress. London: Sage Publications Ltd.

Schall, P.L., Landsbergis, P.A., and Baker, D. (1994). Job strain and cardiovascular disease. Annual Review of Public Health, 15, 381-441.

Schilling, S. Brackbill R.M (1985).(1987). Occupational health and safety risks and potential health consequences perceived by U.S. workers, 1985. Public /health Rep 1987;102:36-46.

Schuler, R.S. (1979). Definition and conceptualisation of stress in organizations (Working paper 79-50). Columbus: Ohio State University, College of Administrative science.

Schottenfeild, R.S. and Cullen, M.R(1985). Occupation-induced postraumatic stress disorders. Am J Psychiatry 1985:142:198-202.

Schwartz, J.E., Waren, K., and Pickering T.G. (1994). Mood, location, and physical posture as predictors of ambulatory blood pressure: Application of a multi-level random effects model: Annals of Behavioural Medicine, 16, 210-220.

Selye, H. (1950). The physiologyvand pathology of exposure to stress. Montreal: Acta.

Shapiro, D., Jamner, L.D., and Goldstein, I.B. (1993). Ambulatory stress psychophysiology: The study of "compensatory and defensive

counterforces" and conflict in a natural setting. Psychosomatic Medicine, 55, 309-323.

Siassi, I. (1984). (1984) Psychiatric Interview and Mental Status Examination. Handbook of Psychological Assessment.

Sklar, L.A., and Anisman, H. (1979). Stress and coping factors influence tumour growth. Science, 205, 513-515.

Stone, L.J., and Hokanson, J.E. (1967). Arousal reduction via self-punitive behaviour. Journal of Personality and Social Psychology, 12, 72-79.

Theorell T., Ahlberg-Hulten G., Jodko M. , Sigala F. , dela Torre B. (1993). Influence of job strain and emotion on blood pressure in female hospital personnel during work hours. Scand J Work Environ Health 1993;9:313-8.

Tubesing Nancy L., Tubesing Donald A. (1983). Adapted from Structured Exercises in Stress Management Vol. 1. Whole Person Press.

Turek, F., Swann J., Earnest D. (1994). Role of the circadian system in reproductive phenomena. Recent Prog Horm Res 1984;40:143-77.

Van Wagoner, S.L.(1985). Nonproductive behaviour in occupational settings. Unpublished master's thesis, University of Maryland, college Park.

Van Wagoner, S.L and Spokane, A. R. (1986). Stress, locus of control, and non-productive behaviour in occupational settings. Manuscript submitted for publication.

Warsaw, L. J. (1988). Occupational Stress. Occup Med State of the Art Rev 1988: 3: 587-93.

Weiner, H. (1977). Psychobiology and human disease. New York: Elsevier.

Williams, M. E., Davidson, G.C., Nezami, E., & DeQuattro, V.(1992). Coginitions of type A and B individuals in response to social criticism. Cognitive Therapy and Research, 16, 19-30.

WHO Technical Report Series, No. 714, (1985). (Report of a WHO Expert Committee on Identification and control of work related diseases).

World Health Organization (WHO) (1986) Principals of early detection of Occupational diseases.

World Health Organization(WHO) (1987) The psychosocial health problems of workers in developing countries. Mostafa A. El-Batawi: Chief Medical Officer, Occupational Health.

WHO Technical Report Series, No 765, (1988) (Report of a WHO Expert Committee on Health Promotion for working populations).

APPENDICES

UNIVERSITY OF GHANA

lephone: Accra 775381 Ext. 8943
case of reply
ase quote
Ref. No.....
r Ref. No.....

DEPARTMENT OF PSYCHOLOGY
P.O. BOX 84
LEGON, GHANA

12th February 1999
.....19.....

Dear Sir/Madam,

INTRODUCTION/REQUEST FOR CONSENT

The bearer of this letter Dr. Margaret Kimiko Yorhormeh Agama is a post graduate student of the Psychology Department at the University of Ghana, Legon.

Dr. Agama is currently enrolled in the M.Phil. programme in Clinical Psychology of the University, and is writing her thesis on Occupational Stress in Ghana. She aims at standardizing an occupational stress scale, for the determination of occupational stress within the Ghanaian working population.

The usefulness of this research will provide a measure of occupational stress which goes relatively undetected but is known to serve as a precursor of psychophysiological illnesses, for example the cardiovascular diseases such as hypertension, heart attacks and strokes, which often have fatal consequences.

The selected Participants are to be randomly drawn, but are expected to hold Professional or managerial positions or their equivalent in your institution. There is to be no discrimination in regard to age, sex, religion or creed, ethnic background, tribe or marital status.

Dr. Agama intends to provide each participant in the research with a questionnaire that would require at least O'level English, and will take at least 20-40 minutes to complete. For this period a quiet room with no distractions at all will be requested from you.

To ensure the confidentially of the Participants and your institution Dr. Agama will collect the data herself, no names of the individual participants will be required, and no references will be made to individual participants or your institution in the analysis or the results. Your institution will NOT be mentioned by name in her research.

Your institution has the ability and the right to withdraw your consent at any time during the process and you may have access to the reseasrch upon its completion by making arrangements directly with Dr. Agama.

I hope this answers any questions that you may have. If not do not hesitate to contact the Department of Psychology, University of Ghana, Legon, or Dr. Agama directly on 402767.

Thank you very much for your consideration.

Respectfully,

HEAD OF DEPT.
DEPT. OF PSYCHOLOGY
(Prof. S.A. Danquah)
Head of Department

Appendix 1.2

OFFICE OF THE CHIEF OF DEFENCE STAFF
GHANA ARMED FORCES
GENERAL HEADQUARTERS
BURMA CAMP

ACCRA 776111 Ext 3445

Reference No. GHQ/1002/26/CDS

15 February, 1999

To whom it may concern

LETTER OF INTRODUCTION

The bearer of this letter Dr Margaret Kimiko Yorhormeh Agama is a civilian employee of Ghana Armed Forces Medical Corps.

Dr Agama is currently enrolled in the Master of Philosophy programme in Clinical Psychology of the University of Ghana and writing her thesis on Occupational Stress in Ghana. She is therefore collecting data from various organisations for her thesis.

Please give Dr Agama all the necessary assistance in the area of data collection.

CS MODEY
Colonel
Military Assistant to the
Chief of Defence Staff

Appendix 1.3

GHQ (Medical)
Burma Camp
Accra

Accra: 021- 402767

MKY/ 005/99

30th June, 1999

Dear Sir / Madam,

THANK YOU LETTER

References:

A. University of Ghana Letter dated 12 February, 1999
B. GHQ/1002/26/CDS dated 15 February, 1999

1. On behalf of my Lectures, and Supervisors of the Department of Psychology, University of Ghana, I would like to say a sincere thank you to you and your staff/students for the cooperation and support I received from your institution.

2. I can assure you that the information would be put to good use, and will benefit Ghanaians as a whole.

3. Once again do accept my humble thanks.

Sincerely,

MKY Agama
Dr
Medical Officer

Appendix 2.1

Directions

Read each statement carefully. For each statement, fill in the circle with the number which fits you best.

Fill in ① if the statement is *rarely* or *never* true.
Fill in ② if the statement is *occasionally* true.
Fill in ③ if the statement is *often* true.
Fill in ④ if the statement is *usually* true.
Fill in ⑤ if the statement is true *most of the time.*

For example, if you believe that a statement is often true about you, you would fill in the ③ circle for that statement on your rating sheet.

Example

1. ① ② ● ④ ⑤

Fill in only one circle for each statement. Be sure to rate ALL of the statements for each section you are asked to complete. DO NOT ERASE! If you need to change an answer, make an "X" through the incorrect response and then fill in the correct circle.

Appendix 2.2

Section One (ORQ)

Make your ratings in Section One of the Rating Sheet.

1. At work I am expected to do too many different tasks in too little time.
2. I feel that my job responsibilities are increasing.
3. I am expected to perform tasks on my job for which I have never been trained.
4. I have to take work home with me.
5. I have the resources I need to get my job done.
6. I feel competent in what I do.
7. I work under tight time deadlines.
8. I wish that I had more help to deal with the demands placed upon me at work.
9. My job requires me to work in several equally important areas at once.
10. I am expected to do more work than is reasonable.
11. I feel that my career is progressing about as I hoped it would.
12. I feel that my job fits my skills and interests.
13. I am bored with my job.
14. I feel I have enough responsibility on my job.
15. I feel my talents are being used on my job.
16. I feel my job has a good future.
17. I am able to satisfy my needs for success and recognition in my job.
18. I feel overqualified for my job.
19. I learn new skills in my work.
20. I have to perform tasks that are beneath my ability.
21. My supervisor provides me with useful feedback about my performance.
22. It is clear to me what I have to do to get ahead.
23. I am uncertain about what I am supposed to accomplish in my work.
24. When faced with several tasks I know which should be done first.
25. I know where to begin a new project when it is assigned to me.
26. My supervisor asks for one thing, but really wants another.
27. I understand what is acceptable personal behavior on my job (e.g., dress, interpersonal relations, etc.)
28. The priorities of my job are clear to me.
29. I have a clear understanding of how my boss wants me to spend my time.
30. I know the basis on which I am evaluated.
31. I feel conflict between what my employer expects me to do and what I think is right or proper.
32. I feel caught between factions at work.
33. I have more than one person telling me what to do.
34. I feel I have a stake in the success of my employer (or enterprise).
35. I feel good about the work I do.
36. My supervisors have conflicting ideas about what I should be doing.
37. I am proud of what I do for a living.
38. It is clear who really runs things where I work.
39. I have divided loyalties on my job.
40. The work I do has as much payoff for me as for my employer.

41. I feel I deal with more people during the day than I prefer.
42. I spend time concerned with the problems others at work bring to me.
43. I am responsible for the welfare of subordinates.
44. People on the job look to me for leadership.
45. I have on the job responsibility for the activities of others.
46. I worry about whether the people who work for/with me will get things done properly.
47. People who work for/with me are really hard to deal with.
48. If I make a mistake in my work, the consequences for others can be pretty bad.
49. My job demands that I handle an angry public.
50. I like the people I work with.
51. On my job I am exposed to high levels of noise.
52. On my job I am exposed to high levels of wetness.
53. On my job I am exposed to high levels of dust.
54. On my job I am exposed to high temperatures.
55. On my job I am exposed to bright light.
56. On my job I am exposed to low temperatures.
57. I have an erratic work schedule.
58. On my job I am exposed to personal isolation.
59. On my job I am exposed to unpleasant odors.
60. On my job I am exposed to poisonous substances.

Section Two (PSQ)

Make your ratings in Section Two of the Rating Sheet.

1. I don't seem to be able to get much done at work.
2. I dread going to work, lately.
3. I am bored with my work.
4. I find myself getting behind in my work, lately.
5. I have accidents on the job of late.
6. The quality of my work is good.
7. Recently, I have been absent from work.
8. I find my work interesting and/or exciting.
9. I can concentrate on the things I need to at work.
10. I make errors or mistakes in my work.
11. Lately, I am easily irritated.
12. Lately, I have been depressed.
13. Lately, I have been feeling anxious.
14. I have been happy, lately.
15. So many thoughts run through my head at night that I have trouble falling asleep.
16. Lately, I respond badly in situations that normally wouldn't bother me.
17. I find myself complaining about little things.
18. Lately, I have been worrying.
19. I have a good sense of humor.
20. Things are going about as they should.
21. I wish I had more time to spend with close friends.
22. I quarrel with my spouse.
23. I quarrel with friends.
24. My spouse and I are happy together.
25. Lately, I do things by myself instead of with other people.
26. I quarrel with members of the family.
27. Lately, my relationships with people are good.
28. I find that I need time to myself to work out my problems.
29. I wish I had more time to spend by myself.
30. I have been withdrawing from people lately.
31. I have unplanned weight gains.
32. My eating habits are erratic.
33. I find myself drinking a lot lately.
34. Lately, I have been tired.
35. I have been feeling tense.
36. I have trouble falling and staying asleep.
37. I have aches and pains I can not explain.
38. I eat the wrong foods.
39. I feel apathetic.
40. I feel lethargic.

Section Three (PRQ)

Make your ratings in Section Three of the Rating Sheet.

1. When I need a vacation I take one.
2. I am able to do what I want to do in my free time.
3. On weekends I spend time doing the things I enjoy most.
4. Lately, my main recreational activity is watching television.
5. A lot of my free time is spent attending performances (e.g., sporting events, theater, movies, concerts, etc.).
6. I spend a lot of my free time in participant activities (e.g., sports, music, painting, woodworking, sewing, etc.).
7. I spend a lot of my time in community activities (e.g., scouts, religious, school, local, government, etc.).
8. I find engaging in recreational activities relaxing.
9. I spend enough time in recreational activities to satisfy my needs.
10. I spend a lot of my free time on hobbies (e.g., collections of various kinds, etc.)
11. I am careful about my diet (e.g., eating regularly, moderately, and with good nutrition in mind).
12. I get regular physical checkups.
13. I avoid excessive use of alcohol.
14. I exercise regularly (at least 20 minutes most days).
15. I practice "relaxation" techniques.
16. I get the sleep I need.
17. I avoid eating or drinking things I know are unhealthy (e.g., coffee, tea, cigarettes, etc.).
18. I engage in meditation.
19. I practice deep breathing exercises a few minutes several times each day.
20. I set aside time to do the things I really enjoy.
21. There is at least one person important to me who values me.
22. I have help with tasks around the house.
23. I have help with the important things that have to be done.
24. There is at least one sympathetic person with whom I can discuss my concerns.
25. There is at least one sympathetic person with whom I can discuss my work problems.
26. I feel I have at least one good friend I can count on.
27. I feel loved.
28. There is a person with whom I feel really close.
29. I have a circle of friends who value me.
30. I gain personal benefit from participation in formal social groups (e.g., religious, political, professional organizations, etc.)
31. I am able to put my job out of my mind when I go home.
32. I feel that there are other jobs I could do besides my current one.
33. I periodically re-examine or reorganize my work style and schedule.
34. I can establish priorities for the use of my time.
35. Once they are set, I am able to stick to my priorities.
36. I have techniques to help avoid being distracted.
37. I can identify important elements of problems I encounter.
38. When faced with a problem I use a systematic approach.
39. When faced with the need to make a decision I try to think through the consequences of choices I might make.
40. I try to keep aware of important ways I behave and things I do.

OSI Rating Sheet – Form HS

Name _____ Age _____ Sex _____

Job Title _____ Date _____

Section One (ORQ)

1 ①②③④⑤	11 ①②③④⑤	21 ①②③④⑤	31 ①②③④⑤	41 ①②③④⑤	51 ①②③④⑤
2 ①②③④⑤	12 ①②③④⑤	22 ①②③④⑤	32 ①②③④⑤	42 ①②③④⑤	52 ①②③④⑤
3 ①②③④⑤	13 ①②③④⑤	23 ①②③④⑤	33 ①②③④⑤	43 ①②③④⑤	53 ①②③④⑤
4 ①②③④⑤	14 ①②③④⑤	24 ①②③④⑤	34 ①②③④⑤	44 ①②③④⑤	54 ①②③④⑤
5 ①②③④⑤	15 ①②③④⑤	25 ①②③④⑤	35 ①②③④⑤	45 ①②③④⑤	55 ①②③④⑤
6 ①②③④⑤	16 ①②③④⑤	26 ①②③④⑤	36 ①②③④⑤	46 ①②③④⑤	56 ①②③④⑤
7 ①②③④⑤	17 ①②③④⑤	27 ①②③④⑤	37 ①②③④⑤	47 ①②③④⑤	57 ①②③④⑤
8 ①②③④⑤	18 ①②③④⑤	28 ①②③④⑤	38 ①②③④⑤	48 ①②③④⑤	58 ①②③④⑤
9 ①②③④⑤	19 ①②③④⑤	29 ①②③④⑤	39 ①②③④⑤	49 ①②③④⑤	59 ①②③④⑤
10 ①②③④⑤	20 ①②③④⑤	30 ①②③④⑤	40 ①②③④⑤	50 ①②③④⑤	60 ①②③④⑤

1 is *rarely or never*, 2 is *occasionally*, 3 is *often*, 4 is *usually*, 5 is *most of the time*

Section Two (PSQ)

1 ①②③④⑤	11 ①②③④⑤	21 ①②③④⑤	31 ①②③④⑤
2 ①②③④⑤	12 ①②③④⑤	22 ①②③④⑤	32 ①②③④⑤
3 ①②③④⑤	13 ①②③④⑤	23 ①②③④⑤	33 ①②③④⑤
4 ①②③④⑤	14 ①②③④⑤	24 ①②③④⑤	34 ①②③④⑤
5 ①②③④⑤	15 ①②③④⑤	25 ①②③④⑤	35 ①②③④⑤
6 ①②③④⑤	16 ①②③④⑤	26 ①②③④⑤	36 ①②③④⑤
7 ①②③④⑤	17 ①②③④⑤	27 ①②③④⑤	37 ①②③④⑤
8 ①②③④⑤	18 ①②③④⑤	28 ①②③④⑤	38 ①②③④⑤
9 ①②③④⑤	19 ①②③④⑤	29 ①②③④⑤	39 ①②③④⑤
10 ①②③④⑤	20 ①②③④⑤	30 ①②③④⑤	40 ①②③④⑤

1 is *rarely or never*, 2 is *occasionally*, 3 is *often*, 4 is *usually*, 5 is *most of the time*

Section Three (PRQ)

1 ①②③④⑤	11 ①②③④⑤	21 ①②③④⑤	31 ①②③④⑤
2 ①②③④⑤	12 ①②③④⑤	22 ①②③④⑤	32 ①②③④⑤
3 ①②③④⑤	13 ①②③④⑤	23 ①②③④⑤	33 ①②③④⑤
4 ①②③④⑤	14 ①②③④⑤	24 ①②③④⑤	34 ①②③④⑤
5 ①②③④⑤	15 ①②③④⑤	25 ①②③④⑤	35 ①②③④⑤
6 ①②③④⑤	16 ①②③④⑤	26 ①②③④⑤	36 ①②③④⑤
7 ①②③④⑤	17 ①②③④⑤	27 ①②③④⑤	37 ①②③④⑤
8 ①②③④⑤	18 ①②③④⑤	28 ①②③④⑤	38 ①②③④⑤
9 ①②③④⑤	19 ①②③④⑤	29 ①②③④⑤	39 ①②③④⑤
10 ①②③④⑤	20 ①②③④⑤	30 ①②③④⑤	40 ①②③④⑤

1 is *rarely or never*, 2 is *occasionally*, 3 is *often*, 4 is *usually*, 5 is *most of the time*

Psychological Assessment Resources, Inc./P.O. Box 998/Odessa, FL 33556/Toll-Free 1-800-331-TEST

OSI Rating Sheet – Form HS

Name _____ Age _____ Sex _____

Job Title _____ Date _____

ORQ Scales

1 ①②③④⑤	11 ⑤④③②①	21 ⑤④③②①	31 ①②③④⑤	41 ①②③④⑤	51 ①②③④⑤
2 ①②③④⑤	12 ⑤④③②①	22 ⑤④③②①	32 ①②③④⑤	42 ①②③④⑤	52 ①②③④⑤
3 ①②③④⑤	13 ①②③④⑤	23 ①②③④⑤	33 ①②③④⑤	43 ①②③④⑤	53 ①②③④⑤
4 ①②③④⑤	14 ⑤④③②①	24 ⑤④③②①	34 ⑤④③②①	44 ①②③④⑤	54 ①②③④⑤
5 ⑤④③②①	15 ⑤④③②①	25 ⑤④③②①	35 ⑤④③②①	45 ①②③④⑤	55 ①②③④⑤
6 ⑤④③②①	16 ⑤④③②①	26 ①②③④⑤	36 ①②③④⑤	46 ①②③④⑤	56 ①②③④⑤
7 ①②③④⑤	17 ⑤④③②①	27 ⑤④③②①	37 ⑤④③②①	47 ①②③④⑤	57 ①②③④⑤
8 ①②③④⑤	18 ①②③④⑤	28 ⑤④③②①	38 ⑤④③②①	48 ①②③④⑤	58 ①②③④⑤
9 ①②③④⑤	19 ⑤④③②①	29 ⑤④③②①	39 ①②③④⑤	49 ①②③④⑤	59 ①②③④⑤
10 ①②③④⑤	20 ①②③④⑤	30 ⑤④③②①	40 ⑤④③②①	50 ⑤④③②①	60 ①②③④⑤

RO_____ RI_____ RA_____ RB_____ R_____ PE_____

PSQ Scales

1 ①②③④⑤	11 ①②③④⑤	21 ①②③④⑤	31 ①②③④⑤	
2 ①②③④⑤	12 ①②③④⑤	22 ①②③④⑤	32 ①②③④⑤	
3 ①②③④⑤	13 ①②③④⑤	23 ①②③④⑤	33 ①②③④⑤	
4 ①②③④⑤	14 ⑤④③②①	24 ⑤④③②①	34 ①②③④⑤	
5 ①②③④⑤	15 ①②③④⑤	25 ①②③④⑤	35 ①②③④⑤	
6 ⑤④③②①	16 ①②③④⑤	26 ①②③④⑤	36 ①②③④⑤	
7 ①②③④⑤	17 ①②③④⑤	27 ⑤④③②①	37 ①②③④⑤	
8 ⑤④③②①	18 ①②③④⑤	28 ①②③④⑤	38 ①②③④⑤	
9 ⑤④③②①	19 ⑤④③②①	29 ①②③④⑤	39 ①②③④⑤	
10 ①②③④⑤	20 ⑤④③②①	30 ①②③④⑤	40 ①②③④⑤	

VS_____ PSY_____ IS_____ PHS_____

PRQ Scales

1 ①②③④⑤	11 ①②③④⑤	21 ①②③④⑤	31 ①②③④⑤	
2 ①②③④⑤	12 ①②③④⑤	22 ①②③④⑤	32 ①②③④⑤	
3 ①②③④⑤	13 ①②③④⑤	23 ①②③④⑤	33 ①②③④⑤	
4 ⑤④③②①	14 ①②③④⑤	24 ①②③④⑤	34 ①②③④⑤	
5 ①②③④⑤	15 ①②③④⑤	25 ①②③④⑤	35 ①②③④⑤	
6 ①②③④⑤	16 ①②③④⑤	26 ①②③④⑤	36 ①②③④⑤	
7 ①②③④⑤	17 ①②③④⑤	27 ①②③④⑤	37 ①②③④⑤	
8 ①②③④⑤	18 ①②③④⑤	28 ①②③④⑤	38 ①②③④⑤	
9 ①②③④⑤	19 ①②③④⑤	29 ①②③④⑤	39 ①②③④⑤	
10 ①②③④⑤	20 ①②③④⑤	30 ①②③④⑤	40 ①②③④⑤	

RE_____ SC_____ SS_____ RC_____

Psychological Assessment Resources, Inc./P.O. Box 998/Odessa, FL 33556/Toll-Free 1-800-331-TEST

Form #RO-1345

Printed in the U.S.A.

OSI Profile Form for Males

Name _____ Age _____

Job Title _____ Date _____

	ORQ Scales						PSQ Scales				PRQ Scales				
	RO	RI	RA	RB	R	PE	VS	PSY	IS	PHS	RE	SC	SS	RC	
	50	43	39	-	47	-	-	41	-	36	-	-	-	-	-80
	49	-	-	39	46	30	30	40	37	35	45	45	-	-	
	-	42	38	38	-	29	-	39	-	-	-	44	-	-	
	48	41	37	-	45	-	-	-	36	34	44	-	-	-	
	47	-	-	37	44	28	29	38	35	-	43	43	-	-	
	-	40	36	36	-	-	-	37	-	33	-	-	-	-	-75
	46	39	35	-	43	27	28	-	34	32	42	42	-	-	
	45	38	-	35	42	-	-	36	-	-	-	41	-	-	
	-	-	34	-	-	26	27	35	33	31	41	-	-	50	
	44	37	-	34	41	-	-	-	-	30	40	40	-	49	
	43	36	33	33	40	25		34	32						-70
	42	-	32	-	-	-	26	33	-	29	39	39	-	48	
	-	35	-	32	39	24	-	-	31	-	-	38	-	-	
	41	34	31	31	38	-	25	32	30	28	38	-	-	47	
	40	-	-	-	-	23	-	31	-	27	37	37	-	46	
	-	33	30	30	37	-	24	30	29	-	-	36	-	-	-65
	39	32	29	29	36	22	-	-	-	26	36	-	-	45	
	38	-	-	-	-	-	23	29	28	25	-	35	50	44	
	-	31	28	28	35	21	-	28	-	-	35	-	49	-	
	37	30	-	27	34	-	-	-	27	24	34	34	-	43	
	36	29	27	-	-	20	22	27	-	-	-	33	48	-	-60
	35	-	26	26	33	-	-	26	26	23	33	-	47	42	
	-	28	-	-	32	19	21	-	25	22	-	32	-	41	
	34	27	25	25	-	-	-	25	-	-	32	-	46	-	
	33	-	-	24	31	18	20	24	24	21	-	31	45	40	
	-	26	24	-	30	-	-	-	-	-	31	30	44	-	-55
	32	25	23	23	-	17	-	23	23	20	30	-	-	39	
	31	-	-	22	29	-	19	22	-	19	-	29	43	38	
	-	24	22	-	28	16	-	21	22	-	29	-	42	-	
	30	23	-	21	-	-	18	-	-	18	-	28	41	37	
	29		21	20	27	15		20	21	17	28	27			-50
	-	22	20	-	26	14	17	19	20	-	27	-	40	36	
	28	21	-	19	-	-	-	-	-	16	-	26	39	35	
	27	20	19	-	25	13	16	18	19	-	26	-	-	-	
	26	-	18	18	24	-	-	17	-	15	-	25	38	34	
	-	19	-	17	-	12	-	-	18	14	25	24	37	-	-45
	25	18	17	-	23	-	15	16	-	-	24	-	36	33	
	24	-	-	16	22	11	-	15	17	13	-	23	-	32	
	-	17	16	15	-	-	14	-	-	12	23	22	35	-	
	23	16	15	-	21	10	-	14	16	-	-	-	34	31	
	22	-	-	-	20	-	13	13	15	11	22	21	-	30	-40
	-	15	14	14	-	-	-	12	-	-	21	-	33	-	
	21	14	-	-	19	-	12	-	14	10	-	20	32	29	
	20	-	13	13	18	-	-	11	-	-	20	19	31	-	
	19	13	12	-	-	-	-	10	13	-	-	-	-	28	
	-	12	-	12	17	-	11	-	-	-	19	18	30	27	-35
	18	11	11	11	16	-	-	-	12	-	18	-	29	-	
	17	-	-	-	-	-	10	-	-	-	-	17	-	26	
	-	10	10	-	15	-	-	-	11	-	17	16	28	-	
	16	-	-	-	14	-	-	-	10	-	-	-	27	25	
	15										16	15	26	24	-30
	-	-	-	-	13	-	-	-	-	-	15	-	-	-	
	14	-	-	-	12	-	-	-	-	-	-	14	25	23	
	13	-	-	-	-	-	-	-	-	-	14	13	24	-	
	12	-	-	-	11	-	-	-	-	-	-	-	-	22	
	-	-	-	-	10	-	-	-	-	-	13	12	23	21	-25
	11	-	-	-	-	-	-	-	-	-	-	-	22	-	
	10	-	-	-	-	-	-	-	-	-	12	11	21	20	
	-	-	-	-	-	-	-	-	-	-	-	10	-	19	
	-	-	-	-	-	-	-	-	-	-	-	-	20	-	
	-	-	-	-	-	-	-	-	-	-	-	-	19	18	-20
	RO	RI	RA	RB	R	PE	VS	PSY	IS	PHS	RE	SC	SS	RC	

P4R Psychological Assessment Resources, Inc./P.O. Box 998/Odessa, FL 33556/TOLL-FREE 1-800-331-TEST

5 6 7 8 9

This form is printed in green ink on white paper. Any other version is unauthorized. Reorder #RO-1346 Printed in the U.S.A.

OSI Profile Form for Females

Name _____ Age _____

Job Title _____ Date _____

	ORQ Scales						PSQ Scales				PRQ Scales			
Score	RO	RI	RA	RB	R	PE	VS	PSY	IS	PHS	RE	SC	SS	RC
80	50	-	-	-	43	40	34	-	-	44	48	-	-	-
	-	-	38	-	-	39	-	44	40	43	-	48	-	-
	49	-	37	44	42	38	33	43	-	-	47	47	-	-
	48	-	-	43	41	-	-	42	39	42	46	-	-	-
	47	-	36	42	-	37	32	41	38	41	-	46	-	-
75	46	50	35	-	40	36	-	-	-	40	45	45	-	-
	-	49	-	41	39	-	31	40	37	39	44	-	-	-
	45	48	34	40	-	35	-	39	36	-	-	44	-	-
	44	47	-	39	38	34	30	38	-	38	43	43	-	50
	43	46	33	38	37	33	-	-	35	37	42	-	-	-
70	42	45	32	-	-	-	29	37	-	36	-	42	-	49
	41	44	-	37	36	32	-	36	34	-	41	41	-	48
	-	43	31	36	35	31	28	35	33	35	40	-	-	-
	40	42	-	35	-	30	-	-	-	34	39	40	-	47
	39	41	30	34	34	-	27	34	32	33	-	39	-	-
65	38	40	29	-	-	29	-	33	-	32	38	38	-	46
	37	39	-	33	33	28	26	32	31	-	37	-	-	45
	-	38	28	32	32	27	-	31	-	31	-	37	-	-
	36	37	27	31	-	-	25	-	30	30	36	36	50	44
	35	36	-	30	31	26	-	30	29	29	35	-	49	-
60	34	35	26	-	30	25	24	29	28	28	-	35	48	43
	33	34	-	29	-	24	-	28	-	-	34	34	-	42
	-	33	25	28	29	-	23	-	27	27	33	-	47	-
	32	32	24	27	28	23	-	27	-	26	-	33	46	41
	31	-	-	26	-	22	22	26	26	25	32	32	45	40
55	30	31	23	-	27	21	-	25	25	-	31	-	-	-
	29	30	-	25	26	-	21	-	-	24	-	31	44	39
	28	29	22	24	-	20	-	24	24	23	30	30	43	-
	-	28	21	23	25	19	20	23	23	22	29	-	42	38
	27	27	-	22	24	-	-	22	-	21	-	29	-	37
50	26	26	20	-	-	18	19	21	22	-	28	28	41	-
	25	25	19	21	23	17	18	-	-	20	27	-	40	36
	24	24	-	20	22	16	-	20	21	19	-	27	39	-
	-	23	18	19	-	-	17	19	20	18	26	26	-	35
	23	22	-	18	21	15	-	18	-	-	25	25	38	34
45	22	21	17	-	-	14	16	-	19	17	24	-	37	-
	21	20	16	17	-	13	-	17	18	16	-	24	36	33
	20	19	-	16	19	-	15	16	-	15	23	23	-	-
	-	18	15	15	18	12	-	15	17	14	22	-	35	32
	19	17	-	14	-	11	14	-	-	-	-	22	34	31
40	18	16	14	-	17	10	-	14	16	13	21	21	33	-
	17	15	13	13	16	-	13	13	15	12	20	-	32	30
	16	14	-	12	-	-	-	12	-	11	-	20	-	29
	15	13	12	11	15	-	12	11	14	10	19	19	31	-
	-	12	11	-	14	-	-	-	13	-	18	-	30	28
35	14	11	-	10	-	-	11	10	-	-	-	18	29	-
	13	10	10	-	13	-	-	-	12	-	17	17	-	27
	12	-	-	-	12	-	10	-	-	-	16	-	28	26
	11	-	-	-	-	-	-	-	11	-	-	16	27	-
	-	-	-	-	11	-	-	-	10	-	15	15	26	25
30	10	-	-	-	10	-	-	-	-	-	14	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	14	25	24
	-	-	-	-	-	-	-	-	-	-	13	13	24	23
	-	-	-	-	-	-	-	-	-	-	12	12	23	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	22
25	-	-	-	-	-	-	-	-	-	-	-	11	22	-
	-	-	-	-	-	-	-	-	-	-	-	10	21	21
	-	-	-	-	-	-	-	-	-	-	-	-	20	20
	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20	-	-	-	-	-	-	-	-	-	-	-	-	19	19
	-	-	-	-	-	-	-	-	-	-	-	-	18	18
	RO	RI	RA	RB	R	PE	VS	PSY	IS	PHS	RE	SC	SS	RC

RS _____

P4R Psychological Assessment Resources, Inc./P.O. Box 998/Odessa, FL 33556/TOLL-FREE 1-800-331-TEST

5 6 7 8 9

Appendix 2.9

Guidelines for Interpreting Scores of the Occupational Stress Inventory

Scale Name	Interpretation
Role Overload (RO)	High scorers may describe their work load as increasing, unreasonable, and supported by needed resources. They may describe themselves as not feeling well trained or competent for the job at hand, needing more help and working under tight deadlines.
Role Insufficiency (RI)	High scorers may report a poor fit between their skills and the job they are performing. They may also report that their career is not progressing and has little future. Needs for recognition and success may not be met. The may report boredom and/or under-utilization.
Role Ambiguity (RA)	High scorers may report a poor sense of what they are expected to do, how they should be spending their time, and how they will be evaluated. They seem not to know where to begin on new projects and experience conflicting demands from supervisors. They may also report no clear sense of what they should do to "get ahead".
Role Boundary (RB)	High scorers may report feeling caught between conflicting supervisory demands and factions. They may report not feeling proud of what they do, or not having a stake in the enterprise. They may also report being unclear about authority lines and having more than one person telling than what to do.
Responsibility (R)	High scorers may report high levels of responsibility for the activities and work performance of subordinates. They are worried that others may not perform well. They are sought out for leadership and frequently have to respond to others problems. They also may have poor relationships with people at work or feel pressure from working with angry or difficult employees or the public.
Physical Environment (PE)	High scorers may report being exposed to high levels of noise, wetness, dust, heat, cold, light, poisonous substances, or unpleasant odors. They may also report having an erratic work schedule or feeling personally isolated.

Vocational Strain (VS)	High scorers may report poor attitudes towards their work, including dread, boredom, and lack of interest. They may report making errors in their work or having accidents. They may also report that the quality of their work is suffering. Concentration problems and absenteeism may be in evidence.
Psychological Strain (PSY)	High scorers may report feeling depressed, anxious, unhappy and/or irritable. They may report complaining about little things, responding badly in routine situations, and having no sense of humour. They may report that things are not "going well".
Interpersonal Strain (IS)	High scorers may report frequent quarrels or excessive dependency on family members, spouses, and friends. They may report wanting to withdraw and have time alone or conversely, not having time to spend with friends.
Physical Strain (PHS)	High scorers may report frequent worries about their health as well as a number of physical symptoms (clods, heart palpitations, aches and pains, stomach aches and erratic eating habits). They may report unplanned weight changes, overuse of alcohol, and disturbances in sleeping patterns. They may also report feeling lethargy and apathy.
Recreation (RE)	High scorers may report taking advantage of the recreational/leisure time coming to them and engaging in a variety of activities, which they fine relaxing and satisfying. They may also report doing the things they most enjoy in their spare time.
Self-care (SC)	High scorers may report that they regularly exercise, sleep eight hours per day, are careful about their diet, practice relaxation techniques, and avoid harmful substances (e.g., alcohol, drugs, tobacco, coffee).
Social Supports (SS)	High scorers may report feeling that there is at least one person they can count on and who values and/or loves them. They may report having sympathetic people to talk to about work problems and report having help to do important things and/or things around the house. They may also report feeling close to another individual.

Rational/Cognitive (RC)	High scorers may report that they have a systematic approach to solving problems, think through the consequences of their choices, and are able to identify important elements of problems encountered. They may report being able to set and follow priorities and have techniques to avoid being distracted. They may also report being able to re-examine and recognize their work schedule. They put their jobs out of their minds when they go home and feel that there are other jobs besides their present one which they can do.

Appendix 3.1

ID NO———

STRESS SYMPTOM INVENTORY REVISED

Name---------- Age----------

Job Title---------- Date----------

Employer---------- Sex----------

The following lists are common problems associated with too much stress.

Mark on the **left side** the frequency with which you have experienced each of these problems in the last six months, with the following symbols:

X—Haven't had this problem
O—Occasionally
F----Frequently
C---Constant/Nearly constant occurrence

Tick on the **right side** in the box, if you have had medical attention during that period.

Physical Symptoms

------Overeating [ ]
------Migraine headache[ ]
------Fatigue [ ]
------Weight change [ ]
------Muscle aches [ ]
------Pounding heart [ ]
------Early morning awakening[ ]
------Rash [ ]
------Foot-tapping [ ]
------Increased alcohol, drug, and tobacco use [ ]
------Menstrual distress [ ]
------Indigestion [ ]
------Tension headaches[ ]
------Tension [ ]
------Insomnia [ ]
------Colds [ ]
------Constipation [ ]
------Accident prone [ ]
------Teeth grinding [ ]
------Nervousness [ ]
------Finger drumming [ ]
------High blood pressure[ ]
-----Low grade infections[ ]

------Cold hands and feet	[ ]	------Muscular tension	[ ]
------Headaches*	[ ]	------Neck aches	[ ]
------Backaches	[ ]	------Ulcers	[ ]
------Chronic constipation	[ ]	------Chronic diarrhea	[ ]
------Muscle spasms	[ ]	------Tremors	[ ]
------Sleeping difficulties	[ ]	------Obesity	[ ]
------Physical weakness	[ ]	------Weight change	[ ]
------Poor concentration	[ ]	-------Lethargy	[ ]

For official use only

Total number of symptoms selected----------

Total number for which medical attention has been sort----------

. Health Score----------

Appendix 4 Table 1a

T-Test

Mean Scores and Standard Deviations for the Occupational Stress Inventory and Stress Symptoms Inventory - Ghanaian Study

	N	Mean	Std. Deviation	Std. Error Mean
age	283	38.81	7.03	.42
ro	416	23.59	6.97	.34
ri	416	23.43	7.71	.38
ra	416	21.57	6.92	.34
rb	416	19.92	7.06	.35
r	416	25.38	7.22	.35
pe	416	17.14	7.15	.35
org	416	21.839	4.978	.244
vs	416	17.51	6.37	.31
psy	416	19.98	7.16	.35
is	416	20.95	6.97	.34
phs	416	17.97	7.39	.36
psq	416	19.1028	6.0013	.2942
re	416	24.80	7.08	.35
sc	416	27.45	8.17	.40
ss	416	36.49	9.15	.47
rc	416	33.80	8.66	.42
prq	416	30.6352	6.0192	.3392
numvsit	416	18.40	10.85	.53
healthsr	416	21.11	10.29	.50
rolele	307	1.71	.45	2.59E-02
sex	416	1.83	.38	1.85E-02
socclass	307	2.65	.64	3.62E-02

Appendix 4 Table 1b

MEAN SCORES AND STANDARD DEVIATIONS FOR MALES AND FEMALES IN THE GHANAIAN STUDY

sex		N	Mean	Std Deviation	Std. Error Mean
prq	1	71	31.1127	5.6669	.6725
	2	345	30.5370	7.1530	.3851
orq	1	71	22.322	3.562	.423
	2	345	21.470	5.221	.281
psq	1	71	19.8592	4.8463	.5752
	2	345	18.9427	6.2071	.3342
numvsit	1	71	16.65	1.25	1.22
	2	345	18.76	10.95	.59
healthsr	1	71	19.63	9.52	1.13
	2	345	21.42	10.43	.56
rolele	1	66	1.79	.41	5.07E-02
	2	241	1.69	.46	2.99E-02
age	1	61	37.21	6.96	.89
	2	222	39.25	7.00	.47
is	1	71	21.89	6.04	.72
	2	345	20.76	7.14	.38
pe	1	71	16.68	6.02	.71
	2	345	17.24	7.37	.40
phs	1	71	19.04	7.15	.85
	2	345	17.75	7.43	.40
psy	1	71	20.83	6.05	.72
	2	345	19.80	7.36	.40
r	1	71	25.35	5.64	.67
	2	345	25.39	7.51	.40
ra	1	71	22.20	6.96	.83
	2	345	21.44	6.91	.37
rb	1	71	20.79	6.96	.83
	2	345	19.74	7.08	.38
rc	1	71	35.42	7.39	.88
	2	345	33.47	8.88	.48
re	1	71	24.27	6.76	.80
	2	345	24.91	7.15	.39
ri	1	71	24.58	7.33	.86
	2	345	23.19	7.79	.42
ro	1	71	24.34	5.37	.64
	2	345	23.43	7.25	.39
sc	1	71	27.21	7.10	.84
	2	345	27.50	8.38	.45

sex		N	Mean	Std Deviation	Std. Error Mean
ss	1	71	37.55	8.95	1.06
	2	345	36.27	9.62	.52
vs	1	71	17.68	5.47	.65
	2	345	17.48	6.55	.35

Key

1 = Females
2 = Males

Appendix 4 Table 1c

T – Test

MEAN SCORES AND STANDARD DEVIATION FOR MANAGERS AND NON-MANAGERS IN THE GHANAIAN STUDY

Sex		N	Mean	Std Deviation	Std. Error Mean
age	1	76	41.21	5.76	.66
	2	189	38.05	7.33	.53
or	1	89	24.94	6.32	.67
	2	218	23.63	5.67	.38
ri	1	89	23.38	6.95	.74
	2	218	23.66	6.96	.47
ra	1	89	21.43	6.32	.67
	2	218	22.08	5.91	.40
rb	1	89	20.09	6.51	.69
	2	218	20.58	6.50	.44
R	1	89	27.42	4.97	.53
	2	218	26.19	5.89	.40
pe	1	89	17.55	6.49	.69
	2	218	17.55	6.19	.42
orq	1	89	22.468	3.628	.385
	2	218	22.282	3.569	.242
vs	1	89	17.81	4.67	.50
	2	218	17.77	5.74	.39
psy	1	89	19.97	5.59	.59
	2	218	20.67	6.49	.44
is	1	89	20.45	5.09	.54
	2	218	21.92	5.66	.38
phs	1	89	17.90	5.91	.63
	2	218	18.38	6.69	.45
psq	1	89	19.0309	3.9843	.4223
	2	218	19.6858	5.0442	.3416
re	1	89	25.81	5.69	.60
	2	218	25.05	6.29	.43
rc	1	89	34.73	6.34	.67
	2	218	34.80	7.50	.51
prq	1	89	31.7669	4.4481	.4715
	2	218	31.3716	5.7334	.3883

Sex		N	Mean	Std. Deviation	Std Error Mean
healthsr	1	89	20.48	9.73	1.03
	2	218	21.11	10.06	.68
numvsit	1	89	17.98	10.08	1.07
	2	218	18.11	10.77	.73
ss	1	89	37.98	6.51	.69
	2	218	37.21	8.50	.58

Key

1 = Managers

2 = Non Managers

Appendix 5 Table 1

Correlations - Ghanaian Study

		sex	rolele	ro	ri	ra	rb	r	pe	orq	vs
sex	Pearson Correlation	1.000	-.090	-.049	-.068	-.041	-.056	.002	.030	-.044	-.012
	Sig. (2-tailed)	.	.117	.321	.169	.400	.257	.967	.547	.371	.812
	N	416	307	416	416	416	416	416	416	416	416
rolele	Pearson Correlation	-.090	1.000	-.102	.018	.049	.034	-.099	.000	-.024	-.003
	Sig. (2-tailed)	.117	.	.076	.750	.388	.547	.085	1.000	.680	.955
	N	307	307	307	307	307	307	307	307	307	307
ro	Pearson Correlation	-.049	-.102	1.000	.240**	.351**	.400**	.469**	.402**	.681**	.327**
	Sig. (2-tailed)	.321	.076	.	.000	.000	.000	.000	.000	.000	000
	N	416	307	416	416	416	416	416	416	416	416
ri	Pearson Correlation	-.068	.018	.240**	1.000	.578**	.502**	.138**	.296**	.671**	.386**
	Sig. (2-tailed)	.169	.750	.000	.	.000	.000	.005	.000	.000	000
	N	416	307	416	416	416	416	416	416	416	416
ra	Pearson Correlation	-.041	.049	.351**	.578**	1.000	.590**	.174**	.368**	.732**	.386**
	Sig. (2-tailed)	.400	.388	.000	.000	.	.000	.000	.000	.000	000
	N	416	307	416	416	416	416	416	416	416	416
rb	Pearson Correlation	-.056	.034	.400**	.502**	.590**	1.000	.275**	.512**	.785**	.431**
	Sig. (2-tailed)	.257	.547	.000	.000	.000	.	.000	000	.000	000
	N	416	307	416	416	416	416	416	416	416	416
r	Pearson Correlation	.002	-.099	.469**	.138**	.174**	.275**	1.000	.401**	.588**	.241**
	Sig. (2-tailed)	.967	.085	.000	.005	.000	.000	.	.000	.000	.000
	N	416	307	416	416	416	416	416	416	416	416
pe	Pearson Correlation	.030	.000	.402**	.296**	.368**	.512**	.401**	1.000	.713**	.464**
	Sig. (2-tailed)	.547	1.000	.000	.000	.000	.000	.000	.	.000	000
	N	416	307	416	416	416	416	416	416	416	416
orq	Pearson Correlation	-.044	-.024	.681**	.671**	.732**	.785**	.588**	.713**	1.000	.537**
	Sig. (2-tailed)	.371	.680	.000	.000	.000	.000	.000	.000	.	.000
	N	416	307	416	416	416	416	416	416	416	416
vs	Pearson Correlation	-.012	-.003	.327**	.386**	.386**	.431**	.241**	.464**	.537**	1.000
	Sig. (2-tailed)	.812	.955	.000	000	.000	.000	.000	.000	.000	.
	N	416	307	416	416	416	416	416	416	416	416
psy	Pearson Correlation	-.054	.052	.323**	.328**	.389**	.480**	.269**	.440**	.534**	.667**
	Sig. (2-tailed)	.269	.368	.000	.000	.000	000	.000	.000	000	000
	N	416	307	416	416	416	416	416	416	416	416

Correlations - Ghanaian Study

		sex	rolele	ro	ri	ra	rb	r	pe	orq	vs
is	Pearson Correlation	-.061	.121*	.316**	.266**	.302**	.403**	.288**	.415**	.477**	.573**
	Sig. (2-tailed)	.216	.035	.000	.000	.000	.000	.000	.000	.000	.000
	N	416	307	416	416	416	416	416	416	416	416
phs	Pearson Correlation	-.066	.034	.315**	.193**	.247**	.399**	.265**	.451**	.447**	.556**
	Sig. (2-tailed)	.179	.555	.000	.000	.000	.000	.000	.000	.000	.000
	N	416	307	416	416	416	416	416	416	416	416
psq	Pearson Correlation	-.057	.062	.372**	.287**	.382**	.497**	.310**	.514**	.578**	.802**
	Sig. (2-tailed)	.244	.275	.000	.000	.000	.000	.000	.000	.000	.000
	N	416	307	416	416	416	416	416	416	416	416
re	Pearson Correlation	.034	-.057	.044	.007	.042	.118*	.131**	.203**	.130**	.250**
	Sig. (2-tailed)	.487	.323	.371	.889	.397	.016	.007	.000	.008	.000
	N	416	307	416	416	416	416	416	416	416	416
sc	Pearson Correlation	.013	-.007	.116*	.000	.001	.094	.225**	.236**	.160**	.216**
	Sig. (2-tailed)	790	.898	.018	.999	.987	.056	.000	.000	.001	.000
	N	416	307	416	416	416	416	416	416	416	416
ss	Pearson Correlation	-.051	-.044	.039	-.059	-.158**	-.111*	.177**	-.017	-.030	.052
	Sig. (2-tailed)	.304	.443	.426	.233	.001	.024	.000	.729	.540	.291
	N	416	307	416	416	416	416	416	416	416	416
rc	Pearson Correlation	-.085	.004	.105*	-.011	-.130**	-.015	.236**	.081	065	.127**
	Sig. (2-tailed)	084	940	.032	.818	.008	.758	.000	.098	189	.010
	N	416	307	416	416	416	416	416	416	416	416
prq	Pearson Correlation	-.031	-.033	.092	-.022	-.084	.015	.235**	.141**	.090	.185**
	Sig. (2-tailed)	.524	.561	.061	655	.087	.757	.000	.004	065	.000
	N	416	307	416	416	416	416	416	416	416	416
healthsr	Pearson Correlation	.065	.029	.305**	.333**	.435**	.456**	.165**	.400**	.509**	.500**
	Sig. (2-tailed)	.184	.617	.000	.000	.000	.000	.001	.000	.000	.000
	N	416	307	416	416	416	416	416	416	416	416
numvsit	Pearson Correlation	.073	.006	.315**	.356**	.424**	.431**	.145**	.365**	.488**	.460**
	Sig. (2-tailed)	135	.918	.000	.000	.000	.000	.003	.000	.000	.000
	N	416	307	416	416	416	416	416	416	416	416

Correlations - Ghanaian Study

		psy	is	phs	psq	re	sc	ss	rc	prq
sex	Pearson Correlation	-.054	-.061	-.066	-.057	.034	.013	-.051	-.085	-.031
	Sig. (2-tailed)	.269	.216	.179	.244	.487	.790	.304	.084	.524
	N	416	416	416	416	416	416	416	416	416
rolele	Pearson Correlation	.052	.121*	.034	.062	-.057	-.007	-.044	.004	-.033
	Sig. (2-tailed)	.368	.035	.555	.275	.323	.898	.443	.940	.561
	N	307	307	307	307	307	307	307	307	307
ro	Pearson Correlation	.323**	.316**	.315**	.372**	.044	.116*	.039	.105*	.092
	Sig. (2-tailed)	.000	.000	.000	.000	.371	.018	.426	.032	.061
	N	416	416	416	416	416	416	416	416	416
ri	Pearson Correlation	.328**	.266**	.193**	.337**	.007	.000	-.059	-.011	-.022
	Sig. (2-tailed)	.000	.000	.000	000	.889	.999	.233	.816	.655
	N	416	416	416	416	416	416	416	416	416
ra	Pearson Correlation	.389**	.302**	.247**	.382**	.042	.001	-.158**	-.130**	-.084
	Sig. (2-tailed)	.000	.000	.000	000	.397	.987	.001	.008	.087
	N	416	416	416	416	416	416	416	416	416
rb	Pearson Correlation	.480**	.403**	.399**	.497**	.118*	.094	-.111*	-.015	.015
	Sig. (2-tailed)	.000	.000	.000	000	.016	.056	.024	.758	.757
	N	416	416	416	416	416	416	416	416	416
r	Pearson Correlation	.269**	.288**	.265**	.310**	.131**	.225**	.177**	.236**	.235**
	Sig. (2-tailed)	.000	.000	.000	000	.007	.000	.000	.000	000
	N	416	416	416	416	416	416	416	416	416
pe	Pearson Correlation	.440**	.415**	.451**	.514**	.203**	.236**	-.017	.081	.141**
	Sig. (2-tailed)	.000	.000	.000	000	.000	.000	.729	.098	.004
	N	416	416	416	416	416	416	416	416	416
orq	Pearson Correlation	.534**	.477**	.447**	.578**	.130**	.160**	-.030	.065	.090
	Sig. (2-tailed)	.000	.000	.000	000	.008	.001	.540	.189	.065
	N	416	416	416	416	416	416	416	416	416
vs	Pearson Correlation	.667**	.573**	.556**	.802**	.250**	.216**	.052	.127**	.185**
	Sig. (2-tailed)	.000	.000	.000	000	.000	.000	.291	.010	.000
	N	416	416	416	416	416	416	416	416	416
psy	Pearson Correlation	1.000	.723**	.715**	.905**	.268**	.255**	.089	.174**	.229**
	Sig. (2-tailed)	.	.000	.000	000	.000	.000	.071	.000	.000
	N	416	416	416	416	416	416	416	416	416

Correlations - Ghanaian Study

		psy	is	phs	psq	re	sc	ss	rc	prq
is	Pearson Correlation	.723**	1.000	.674**	.865**	.367**	.376**	.135**	.251**	.330**
	Sig. (2-tailed)	.000	.	.000	.000	.000	.000	.006	.000	.000
	N	416	416	416	416	416	416	416	416	416
phs	Pearson Correlation	.715**	.674**	1.000	.864**	.248**	.175**	.094	.136**	.190**
	Sig. (2-tailed)	.000	.000	.	.000	.000	.000	.055	.006	.000
	N	416	416	416	416	416	416	416	416	416
psq	Pearson Correlation	.905**	.865**	.864**	1.000	.329**	.296**	.108*	.200**	.272**
	Sig. (2-tailed)	.000	.000	.000	.	.000	.000	.027	.000	.000
	N	416	416	416	416	416	416	416	416	416
re	Pearson Correlation	.258**	.367**	.248**	.329**	1.000	.591**	.453**	.518**	.748**
	Sig. (2-tailed)	.000	.000	.000	.000	.	.000	.000	.000	.000
	N	416	416	416	416	416	416	416	416	416
sc	Pearson Correlation	.255**	.376**	.175**	.296**	.591**	1.000	.527**	.641**	.829**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.	.000	.000	.000
	N	416	416	416	416	416	416	416	416	416
ss	Pearson Correlation	.089	.135**	.094	.108*	.453**	.527**	1.000	.713**	.839**
	Sig. (2-tailed)	.071	.006	.055	.027	.000	.000	.	.000	.000
	N	416	416	416	416	416	416	416	416	416
rc	Pearson Correlation	.174**	.251**	.136**	.200**	.518**	.641**	.713**	1.000	.880**
	Sig. (2-tailed)	.000	.000	.006	.000	.000	.000	.000	.	.000
	N	416	416	416	416	416	416	416	416	416
prq	Pearson Correlation	.229**	.330**	.190**	.272**	.748**	.829**	.839**	.880**	1.000
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.
	N	416	416	416	416	416	416	416	416	416
healthsr	Pearson Correlation	.553**	.506**	.527**	.607**	-.051	-.144**	-.272**	-.191**	-.209**
	Sig. (2-tailed)	.000	.000	.000	.000	.295	.003	.000	.000	.000
	N	416	416	416	416	416	416	416	416	416
numvsit	Pearson Correlation	.529**	.477**	.509**	.575**	-.052	-.157**	-.279**	-.191**	-.215**
	Sig. (2-tailed)	.000	.000	.000	.000	.286	.001	.000	.000	.000
	N	416	416	416	416	416	416	416	416	416

Correlations - Ghanaian Study

		healthsr	numvsit
sex	Pearson Correlation	.065	.073
	Sig. (2-tailed)	.184	.135
	N	416	416
rolele	Pearson Correlation	.029	.006
	Sig. (2-tailed)	.617	.918
	N	307	307
ro	Pearson Correlation	.305**	.315**
	Sig. (2-tailed)	.000	.000
	N	416	416
ri	Pearson Correlation	.363**	.356**
	Sig. (2-tailed)	.000	.000
	N	416	416
ra	Pearson Correlation	.435**	.424**
	Sig. (2-tailed)	.000	.000
	N	416	416
rb	Pearson Correlation	.456**	.431**
	Sig. (2-tailed)	.000	.000
	N	416	416
r	Pearson Correlation	.165**	.145**
	Sig. (2-tailed)	.001	.003
	N	416	416
pe	Pearson Correlation	.400**	.365**
	Sig. (2-tailed)	.000	.000
	N	416	416
orq	Pearson Correlation	.509**	.488**
	Sig. (2-tailed)	.000	.000
	N	416	416
vs	Pearson Correlation	.500**	.460**
	Sig. (2-tailed)	.000	.000
	N	416	416
psy	Pearson Correlation	.553**	.529**
	Sig. (2-tailed)	.000	.000
	N	416	416

Correlations -- Ghanaian Study

		healthsr	numvsit
is	Pearson Correlation	.506**	.477**
	Sig. (2-tailed)	.000	.000
	N	416	416
phs	Pearson Correlation	.527**	.509**
	Sig. (2-tailed)	.000	.000
	N	416	416
psq	Pearson Correlation	.607**	.575**
	Sig. (2-tailed)	.000	.000
	N	416	416
re	Pearson Correlation	-.051	-.052
	Sig (2-tailed)	.295	.286
	N	416	416
sc	Pearson Correlation	-.144**	-.157**
	Sig. (2-tailed)	.003	.001
	N	416	416
ss	Pearson Correlation	-.272**	-.279**
	Sig (2-tailed)	.000	.000
	N	416	416
rc	Pearson Correlation	-.191**	-.191**
	Sig (2-tailed)	.000	.000
	N	416	416
prq	Pearson Correlation	-.209**	-.215**
	Sig. (2-tailed)	.000	.000
	N	416	416
healthsr	Pearson Correlation	1.000	.960**
	Sig (2-tailed)	.	.000
	N	416	416
numvsit	Pearson Correlation	.960**	1.000
	Sig. (2-tailed)	.000	.
	N	416	416

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed)

Appendix 5

Table 2.
Correlation between the Occupational Role Domain and the subscales of the Personal Strain and Personal Resources Domain

	IS	PS	PHS	VS	R	SC
ORQ	.477**	.477**	.554**	.537**	.130**	.160**

*Note significant level = p<0.01

Table 3.

Correlation between the Personal Strain Domain and the subscales of the Personal Strain Domain

	PE	R	RC	BB	RI	RO	PRQ	SC	SS
PSQ	.514**	.310**	.382**	.497**	.333**	.372**	.272**	.296**	.108**

*Note significant level = p<0.01

Table 4.
Correlation between the Personal Resources Domain and the subscales of the Personal Strain Domain

	IS	PHS	PSY	VS
PRQ	.330**	.190**	.229**	.185**

*Note significant level = p<0.01

Appendix 6 Tables 1 and 2

Table A3 T-scores for OSI Scales for Males

Raw Scores	Scales RO	RI	RA	RB	R	PE	VS	PSY	IS	PHS	RE	SC	SS	RC	Raw Scores
50	80	90	98	97	85			93			87	88	63	72	50
49	79	88	97	95	83			92			86	86	62	71	49
48	77	87	95	93	82			91	99		84	84	60	69	48
47	76	85	93	92	80			89	97	98	82	83	59	67	47
46	74	84	92	90	79			88	95	96	81	81	57	66	46
45	73	83	90	89	77			86	94	95	79	79	56	64	45
44	71	81	88	87	76			85	92	93	77	78	55	63	44
43	70	80	87	86	74			83	90	92	76	76	53	61	43
42	69	78	85	84	73			82	88	90	74	74	52	59	42
41	67	77	83	82	71			80	86	88	72	73	51	58	41
40	66	75	82	81	70	99		79	85	87	71	71	49	56	40
39	64	74	80	79	68	97	99	78	83	85	69	69	48	54	39
38	63	73	78	78	67	95	97	76	81	84	67	68	46	53	38
37	61[a]	71	77	76	65	93	95	75	79	82	66	66	45	51	37
36	60	70	75	75	64	91	92	73	77	80	64	65	44	49	36
35	59	68	74	73	62	89	90	72	76	79	62	63	42	48	35
34	57	67	72	71	61	87	88	70	74	77	61	61	41	46	34
33	56	65	70	70	59	85	85	69	72	75	59	60	39	44	33
32	54	64	69	68	58	83	83	67	70	74	57	58	38	43	32
31	53	62	67	67	56	81	81	66	68	72	55	56	37	41	31
30	51	61	65	65	55	79	79	65	67	71	54	55	35	40	30
29	50	60	64	64	53	78	76	63	65	69	52	53	34	38	29
28	48	58	62	62	52	76	74	62	63	67	50	51	32	36	28
27	47	57	60	61	50	74	72	60	61	66	49	50	31	35	27
26	46	55	59	59	49	72	69	59	59	64	47	48	30	33	26
25	44	54	57	57	47	70	67	57	58	63	45	46	28	31	25
24	43	52	55	56	46	68	65	56	56	61	44	45	27	30	24
23	41	51	54	54	44	66	63	54	54	59	42	43	25	28	23
22	40	49	52	53	43	64	60	53	52	58	40	42	24	26	22
21	38	48	50	51	41	62	58	52	50	56	39	40	23	25	21
20	37	47	49	50	40	60	56	50	49	54	37	38	21	23	20
19	36	45	47	48	38	58	53	49	47	53	35	37	20	22	19
18	34	44	46	46	37	56	51	47	45	51	34	35	19	20	18
17	33	42	44	45	35	54	49	46	43	50	32	33	17	18	17
16	31	41	42	43	34	52	47	44	41	48	30	32	16	17	16
15	30	39	41	42	32	50	44	43	40	46	29	30	14	15	15
14	28	38	39	39	31	49	42	41	38	45	27	28	13	13	14
13	27	36	37	37	29	47	40	40	36	43	25	27	12	12	13
12	26	35	36	35	28	45	38	39	34	42	23	25	10	11	12
11	24	34	34	34	26	43	35	37	32	40		23	9	9	11
10	23	32	32		25	41	33	36	31	38		22	7	7	10

Note. n_s = 168 (RO, RI, RA, RB), 161 (R, PE), 151 (VS, PSY), 150 (IS), 68 (PHS), 125 (RE, SC, SS, RC)

Table A4 T-scores for OSI Scales for Females

Raw Scores	Scales RO	RI	RA	RB	R	PE	VS	PSY	IS	PHS	RE	SC	SS	RC	Raw Scores
50	80	75	99	87	90	94		87	95	88	83	82	62	72	50
49	78	74	97	85	89	92		86	93	86	81	81	61	70	49
48	77	73	96	83	87	91		85	92	85	80	79	60	69	48
47	76	72	94	82	86	90		83	90	84	78	78	58	67	47
46	75	71	92	81	94	88		82	89	82	77	76	57	65	46
45	73	70	91	80	83	87		81	87	81	75	75	56	64	45
44	72	69	89	78	81	86	99	79	85	80	74	73	54	62	44
43	71	68	88	77	80	84	97	78	84	79	72	72	53	60	43
42	70	67	86	76	78	83	95	77	82	77	71	70	52	59	42
41	69	66	84	74	77	82	93	76	81	76	69	69	50	57	41
40	67	65	83	73	75	80	91	74	79	75	68	67	49	56	40
39	66	64	81	72	74	79	89	73	77	74	67	66	48	54	39
38	65	63	79	71	72	78	87	72	76	72	65	65	46	52	38
37	64	62	78	69	71	76	85	70	74	71	64	63	45	51	37
36	62	61	76	68	69	75	83	69	73	70	62	62	44	49	36
35	61	60	75	67	68	73	81	68	71	68	61	60	42	47	35
34	60	59	73	66	66	72	80	66	69	67	59	59	41	46	34
33	59	58	71	64	64	71	78	65	68	66	58	57	40	44	33
32	57	57	70	63	63	69	76	64	66	65	56	56	39	42	32
31	56	55	68	62	61	68	74	63	64	63	55	54	37	41	31
30	55	54	66	61	60	67	72	61	62	62	53	53	36	39	30
29	54	53	65	59	58	65	70	60	61	61	52	51	35	38	29
28	53	52	63	58	57	64	68	59	60	60	50	50	33	36	28
27	51	51	62	57	55	63	66	57	58	58	49	48	32	34	27
26	50	50	60	56	54	61	64	56	56	57	47	47	31	33	26
25	49	49	58	54	52	60	62	55	55	56	46	46	29	31	25
24	48	48	57	53	51	59	60	53	53	54	45	44	28	29	24
23	46	47	55	52	49	57	58	52	52	53	43	43	27	28	23
22	45	46	53	51	48	56	56	51	50	52	42	41	25	26	22
21	44	45	52	49	46	55	54	50	48	51	40	40	24	24	21
20	43	44	50	48	45	53	52	48	47	49	39	38	23	23	20
19	41	43	49	47	43	52	50	47	45	48	37	37	21	21	19
18	40	42	47	46	42	50	49	46	44	47	36	35	20	20	18
17	39	41	45	44	40	49	47	44	42	45	34	34	19	18	17
16	38	40	44	43	39	48	45	43	40	44	33	32	17	16	16
15	37	39	42	42	37	46	43	42	39	43	31	31	16	15	15
14	35	38	40	41	36	45	41	40	37	42	30	29	15	13	14
13	34	37	39	39	34	44	39	39	36	40	28	28	14	11	13
12	33	36	37	38	33	42	37	38	34	39	27	27	12	10	12
11	32	35	36	37	31	41	35	37	32	38		25	11	8	11
10	30	34	34	35	30	40	33	35	31	37		24	9	7	10

Note. n_s = 257 (RO, RI, RA, RB), 251 (R, PE), 195 (VS, PSY), 192 (IS), 89 (PHS), 212 (RE, SC), 210 (SS, RC)

Appendix 6 Table 3

T – Scores – Ghanaian Study

casrnum	groupid	sex	age	socclass	Rolel e	ro	ri	ra	rb	r	pe	orq	vs	psy	is	phs
1	OGRP01	2		1	1	30	18	18	19	31	33	24.8	21	23	25	22
2	OGRP01	2		1	1	34	21	21	17	38	18	24.8	14	23	21	30
3	OGRP01	2	46	1	1	46	25	28	27	37	25	31.3	29	14	18	22
4	OGRP01	2		1	1	23	27	24	18	33	13	23.0	21	28	23	21
5	OGRP01	2	47	1	1	19	13	10	11	24	10	14.5	13	17	22	22
6	OGRP01	2		1	1	17	28	19	21	34	16	22.5	14	16	22	16
7	OGRP01	2		1	1	27	37	32	23	23	15	26.2	17	11	13	11
8	OGRP01	2	46	1	1	15	22	16	12	20	16	16.8	18	18	22	17
9	OGRP01	2	49	1	2	19	16	10	13	23	15	16.0	11	10	12	16
10	OGRP01	2		3	2	32	10	16	12	43	14	21.2	12	13	13	14
11	OGRP01	2		3	2	32	33	21	22	28	16	25.3	18	20	23	15
12	OGRP01	2		3	2	15	20	19	15	25	15	18.2	14	15	13	19
13	OGRP01	2	48	3	2	37	25	28	20	33	14	26.2	28	30	26	27
14	OGRP01	2	46	3	2	34	30	16	17	31	11	23.2	15	18	18	16
15	OGRP01	2	29	3	2	24	11	17	19	28	16	19.2	11	20	26	13
16	OGRP01	2	45	3	2	22	19	20	21	30	21	22.2	21	20	20	20
17	OGRP02	2	38	3	2	33	33	27	31	32	37	32.2	32	42	34	34
18	OGRP02	2	32	2	1	24	24	28	33	32	34	29.2	26	40	28	23
19	OGRP02	2	36	2	1	26	21	30	26	26	26	25.8	25	31	37	30
20	OGRP02	1	29	2	1	25	25	32	31	32	36	30.2	25	31	24	30
21	OGRP02	2	45	1	1	23	33	26	21	25	15	23.8	21	24	22	19
22	OGRP02	2	40	3	1	18	28	26	23	29	26	25.0	14	19	17	13
23	OGRP02	2	43	3	2	30	19	20	20	24	26	23.2	12	20	19	11

T Scores Ghanaian Study

24	OGRP02	2	32	3	2	19	26	25	20	23	25	23.0	23	25	20	15
25	OGRP02	2	42	3	1	20	27	31	18	24	23	23.8	20	16	17	10
26	OGRP02	2	42	3	1	30	43	17	29	28	16	27.2	29	27	20	13
27	OGRP02	2	43	3	1	35	24	27	23	34	23	27.7	21	25	23	21
28	OGRP02	2	40	3	1	28	20	27	28	24	21	24.7	20	27	24	24
29	OGRP02	1	34	3	2	35	15	22	19	29	19	23.2	18	20	26	21
30	OGRP02	1	28	3	1	27	22	22	27	24	19	23.5	23	18	26	19
31	OGRP02	2	42	3	2	23	34	19	28	36	17	26.2	18	20	22	15
32	OGRP02	2	37	3	1	19	17	21	16	21	20	19.0	24	19	13	16
33	OGRP02	2	35	3	1	24	15	21	14	21	19	19.0	21	25	21	21
34	OGRP02	2	42	3	2	28	25	24	27	35	35	29.0	18	23	26	10
35	OGRP02	2	33	3	1	17	19	26	25	29	31	24.5	16	23	26	17
36	OGRP02	2	37	3	1	18	31	19	30	32	34	27.3	19	20	16	17
37	OGRP02	2	37	3	1	31	30	24	24	25	27	26.8	14	15	21	26
38	OGRP02	2	47	3	2	24	26	23	26	33	23	25.8	19	30	25	22
39	OGRP02	2	37	3	2	28	19	10	16	28	15	19.3	12	18	21	15
40	OGRP02	2	42	3	1	17	23	25	21	33	12	21.8	14	18	18	10
41	OGRP02	2	38	3	1	25	26	19	14	30	18	22.0	17	20	18	16
42	OGRP02	2	40	3	1	27	36	26	27	29	20	27.5	24	32	17	16
43	OGRP02	2	50	3	2	30	24	20	10	26	26	22.7	16	21	17	14
44	OGRP02	2	27	3	2	28	21	23	16	18	20	21.0	18	21	18	15
45	OGRP02	2	34	3	1	29	23	15	17	25	12	20.2	18	19	18	17
46	OGRP02	1	30	3	2	21	20	21	20	29	23	22.3	17	28	33	30
47	OGRP02	1	31	3	2	12	21	23	22	18	22	19.7	16	29	37	29
48	OGRP02	1	29	3	2	28	21	21	28	17	13	21.3	13	15	25	32
49	OGRP02	2	32	3	2	13	18	18	16	20	20	17.5	17	16	20	10
50	OGRP02	2	26	3	2	15	15	13	15	22	15	15.8	19	12	18	12
51	OGRP02	2	34	3	1	27	30	24	33	31	33	29.7	29	31	37	37
52	OGRP02	2	52	2	1	31	17	11	9	29	26	20.5	16	13	21	19
53	OGRP02	2	52	2	1	20	21	18	21	26	21	21.2	19	22	22	22

T Scores Ghanaian Study

54	OGRP02	1	40	3	1	22	34	29	24	24	20	25.5	19	20	25	20
55	OGRP02	1	46	3	2	24	26	21	28	23	17	23.2	15	17	19	14
56	OGRP02	1	29	3	2	33	20	21	16	24	29	23.8	21	26	25	29
57	OGRP02	1	28	3	2	24	16	20	11	28	16	19.2	19	18	21	14
58	OGRP02	1	35	3	2	19	21	19	10	27	13	18.2	13	17	22	12
59	OGRP02	1	30	3	2	22	18	18	10	24	15	17.8	11	18	22	15
60	OGRP02	1	37	3	2	18	20	17	10	29	16	18.3	15	14	15	13
61	OGRP02	2	38	3	2	20	33	29	30	25	17	25.7	17	23	24	18
62	OGRP02	2	34	3	1	26	19	20	9	29	19	20.3	21	21	22	17
63	OGRP02	2	32	3	2	23	29	27	20	28	16	23.8	21	22	21	20
64	OGRP02	1	37	3	2	23	38	32	17	27	15	25.3	22	17	23	21
65	OGRP02	2	36	2	1	30	16	16	17	32	32	23.8	22	16	16	13
66	OGRP02	2	34	3	2	28	22	32	30	17	10	23.2	18	27	20	12
67	OGRP03	1	44	.	.	26	21	16	29	32	13	22.8	25	20	27	26
68	OGRP03	2	.	.	.	24	28	26	22	33	13	24.3	20	22	22	17
69	OGRP03	2	31	.	.	24	23	27	14	18	10	19.3	18	21	19	11
70	OGRP03	2	.	.	.	25	16	14	12	20	10	16.2	18	20	17	14
71	OGRP03	2	.	.	.	15	29	34	16	13	12	19.8	18	17	25	12
72	OGRP03	2	.	.	.	25	32	33	26	16	14	24.3	20	21	22	14
73	OGRP03	1	.	.	.	20	27	10	29	16	10	18.7	18	17	14	21
74	OGRP03	2	30	2	1	27	23	21	13	21	11	19.3	13	18	25	14
75	OGRP03	2	33	2	2	35	19	29	19	17	12	21.8	33	27	26	16
76	OGRP03	2	44	2	1	33	11	21	25	33	17	23.3	13	18	24	23
77	OGRP03	1	35	3	2	21	42	23	25	12	17	23.3	26	33	27	34
78	OGRP03	2	33	3	2	18	32	23	32	20	12	22.8	13	12	21	12
79	OGRP03	2	41	2	1	18	16	18	17	25	10	17.3	11	17	17	14
80	OGRP03	2	44	2	1	33	34	29	31	36	26	31.5	30	22	29	32
81	OGRP03	1	.	2	1	19	31	17	21	27	11	21.0	20	22	18	23
82	OGRP03	2	.	2	1	23	31	19	30	26	13	23.7	17	14	25	17
83	OGRP03	2	.	2	1	20	21	19	20	23	13	19.3	16	15	14	11

84	OGRP03	2	41	3	2	23	28	24	18	30	10	22.2	17	21	19	16
85	OGRP03	2	.	.	.	33	16	21	18	30	16	22.3	15	21	22	18
86	OGRP03	2	.	.	.	25	18	16	15	25	11	18.3	13	16	17	11
87	OGRP03	2	.	.	.	13	37	28	19	13	15	20.8	15	15	17	19
88	OGRP03	2	.	.	.	29	28	22	22	25	14	23.3	18	22	22	16
89	OGRP03	2	.	.	.	37	31	30	29	32	20	29.8	35	28	30	28
90	OGRP03	2	.	.	.	21	36	33	27	16	25	26.3	31	33	33	30
91	OGRP03	2	.	.	.	21	40	22	18	19	11	21.8	15	15	15	12
92	OGRP03	2	.	.	.	23	30	14	18	12	11	18.0	16	17	14	10
93	OGRP03	2	45	.	.	32	18	22	16	33	14	22.5	19	19	23	27
94	OGRP03	2	40	.	.	29	21	23	17	23	13	21.0	14	18	16	19
95	OGRP03	2	43	.	.	29	21	26	17	24	25	23.7	14	21	22	31
96	OGRP03	2	40	.	.	33	33	34	23	21	21	27.5	25	26	28	24
97	OGRP03	2	42	2	1	19	19	23	21	21	10	18.8	14	15	19	15
98	OGRP03	2	.	.	.	18	25	22	24	15	14	19.7	13	28	27	17
99	OGRP03	2	41	2	1	25	20	16	24	25	12	20.3	13	14	20	21
100	OGRP03	2	.	.	.	16	17	15	10	22	12	15.3	14	14	20	13
101	OGRP03	1	35	.	.	18	31	12	10	23	14	18.0	16	15	14	15
102	OGRP03	2	28	.	.	19	32	11	15	10	17	17.3	14	18	15	22
103	OGRP03	2	.	.	.	15	31	18	16	16	17	18.8	19	25	21	20
104	OGRP03	2	.	.	.	24	19	13	11	29	15	18.5	24	27	47	31
105	OGRP03	2	.	.	.	22	14	13	11	29	15	17.3	13	14	15	13
106	OGRP03	2	47	2	1	23	15	13	13	22	11	16.2	12	16	25	13
107	OGRP03	2	.	.	.	14	29	26	19	24	15	21.2	18	21	16	19
108	OGRP04	2	35	3	2	23	29	27	25	28	13	24.2	14	18	31	20
109	OGRP04	2	40	3	2	27	23	19	10	18	11	18.0	14	19	23	20
110	OGRP04	2	26	3	2	20	19	21	22	20	17	19.8	13	14	23	15
111	OGRP04	2	46	3	2	17	19	15	10	34	12	17.8	14	16	23	19
112	OGRP04	2	33	3	2	33	19	25	31	32	26	27.7	22	20	25	24
113	OGRP04	2	32	3	2	29	37	30	43	12	20	28.5	22	21	19	17

114	OGRP04	2	42	3	2	30	27	22	18	24	27	24.7	20	35	22	16
115	OGRP04	2	.	3	2	26	16	14	15	27	13	18.5	12	19	16	27
116	OGRP04	2	39	3	2	26	15	17	16	19	21	19.0	15	27	28	33
117	OGRP04	1	31	3	2	28	34	33	28	19	24	27.7	16	30	21	26
118	OGRP04	2	23	3	2	22	21	22	18	16	23	20.3	15	14	12	13
119	OGRP04	2	.	3	2	24	30	25	13	18	17	21.2	27	28	25	21
120	OGRP04	2	36	3	2	24	33	24	28	24	21	25.7	17	17	17	20
121	OGRP04	2	28	3	2	27	27	33	20	21	19	24.5	23	22	19	24
122	OGRP04	2	45	2	1	29	13	16	22	32	13	20.8	16	16	26	17
123	OGRP04	2	32	3	2	30	22	27	25	25	24	25.5	17	19	17	18
124	OGRP04	2	30	3	2	26	15	22	24	26	21	22.3	19	19	18	14
125	OGRP04	2	50	2	1	20	34	23	14	34	18	23.8	15	18	28	10
126	OGRP04	2	45	2	1	22	22	24	24	23	12	21.2	17	19	18	15
127	OGRP04	1	42	2	1	30	37	26	18	26	14	25.2	19	18	26	9
128	OGRP04	2	40	2	1	31	16	12	10	32	10	18.5	15	17	13	15
129	OGRP04	2	41	2	1	31	16	12	10	32	10	18.5	15	17	13	15
130	OGRP04	2	40	2	1	30	37	26	18	26	14	25.2	19	18	26	9
131	OGRP04	1	32	3	2	30	37	26	18	26	14	25.2	24	18	26	9
132	OGRP04	2	42	2	1	22	22	24	24	23	12	21.2	17	19	18	15
133	OGRP04	2	35	3	2	22	22	24	24	23	12	21.2	17	19	18	15
134	OGRP04	2	36	3	2	22	22	24	24	23	12	21.2	17	19	18	15
135	OGRP04	2	47	2	1	22	22	24	24	23	12	21.2	17	19	18	15
136	OGRP04	2	38	2	1	22	22	24	24	23	12	21.2	17	19	22	20
137	OGRP04	2	40	2	1	22	22	24	24	23	12	21.2	17	19	22	20
138	OGRP04	2	44	2	1	31	16	12	10	32	10	18.5	15	17	13	15
139	OGRP04	1	36	2	1	31	16	12	10	32	10	18.5	15	17	13	15
140	OGRP04	1	37	3	2	31	16	12	10	32	10	18.5	15	17	13	15
141	OGRP04	1	38	2	1	31	16	12	10	32	10	18.5	15	17	13	15
142	OGRP04	2	38	2	1	30	37	26	18	26	14	25.2	19	18	26	9
143	OGRP04	1	44	2	1	30	37	26	18	26	14	25.2	19	18	26	9

144	OGRP04	1	39	3	2	31	16	12	10	32	10	18.5	15	17	13	15
145	OGRP04	1	31	2	2	30	37	26	18	26	14	25.2	19	18	26	9
146	OGRP04	1	37	4	2	31	37	26	18	26	14	25.3	19	18	26	9
147	OGRP04	2	.	.	.	0	0	0	0	0	0	0	0	0	0	0
148	OGRP05	2	.	.	.	39	35	28	38	41	38	36.5	34	36	36	38
149	OGRP05	2	.	.	.	32	27	26	31	36	38	31.7	33	37	29	29
150	OGRP04	2	.	.	.	18	19	16	18	27	10	18.0	16	23	19	16
151	OGRP05	2	.	.	.	31	22	18	16	34	18	23.2	22	20	22	13
152	OGRP05	2	.	.	.	18	25	31	15	28	12	21.5	19	16	15	12
153	OGRP05	2	.	.	.	20	25	23	15	29	12	20.7	17	16	15	12
154	OGRP05	2		.	.	29	22	23	15	29	16	22.3	12	19	25	14
155	OGRP05	2	.	.	.	32	37	37	31	27	28	32.0	34	27	23	26
156	OGRP05	2	.	.	.	34	29	28	31	25	20	27.8	22	24	19	22
157	OGRP05	2	.	.	.	23	34	26	16	28	13	23.3	13	12	18	14
158	OGRP05	2	.	.	.	23	16	19	17	40	22	22.8	18	28	26	28
159	OGRP05	2	42	.	.	34	12	12	12	34	32	22.7	14	12	18	14
160	OGRP05	2	.	.	.	28	27	18	25	39	15	25.3	20	18	25	15
161	OGRP05	2	.	2	1	23	28	21	24	21	13	21.7	23	18	21	17
162	OGRP05	2	36	2	1	20	24	19	2	26	14	20.8	17	18	18	14
163	OGRP05	2	.	3	2	20	21	18	23	35	10	21.2	13	14	13	14
164	OGRP05	2	38	3	2	29	25	21	21	20	14	21.7	17	21	22	16
165	OGRP05	2	.	3	2	20	23	18	11	35	10	19.5	11	14	13	14
166	OGRP05	2	.	3	2	20	21	18	11	28	10	18.0	11	14	13	14
167	OGRP05	2	35	3	2	22	26	19	17	21	16	20.2	18	21	22	14
168	OGRP05	2	.	3	2	25	20	22	13	27	19	21.0	15	19	24	17
169	OGRP05	2	.	3	2	20	21	18	11	35	10	19.2	13	14	13	14
170	OGRP05	2	37	3	2	35	24	21	29	27	18	25.7	19	18	23	23
171	OGRP05	2	40	3	2	28	27	19	14	25	16	21.5	15	12	18	17
172	OGRP05	2	35	.	.	29	19	19	25	27	20	23.2	15	19	21	17
173	OGRP05	2	38	3	2	37	32	37	28	28	34	32.7	30	24	27	25

174	OGRP05	2	.	.	.	34	31	24	28	38	46	33.5	38	28	38	38
175	OGRP05	2	38	3	2	26	25	28	19	27	24	24.8	16	24	22	18
176	OGRP05	2	.	.	.	32	30	34	31	28	25	30.0	31	30	25	23
177	OGRP05	2	40	3	2	12	15	20	10	34	10	16.8	16	15	16	10
178	OGRP05	2	.	.	.	34	28	26	31	36	45	33.3	38	33	38	39
179	OGRP05	2	.	.	.	22	24	24	10	30	19	21.5	18	16	14	10
180	OGRP05	2	29	3	2	27	18	13	19	35	36	24.7	35	40	33	34
181	OGRP05	2	.	.	.	31	22	21	20	20	0	19.0	25	29	20	23
182	OGRP05	2	.	.	.	36	20	17	31	31	31	27.7	29	32	29	33
183	OGRP05	2	39	3	2	29	16	14	15	23	12	18.2	12	12	16	10
184	OGRP05	2	.	3	2	29	21	21	23	41	24	26.5	20	26	25	19
185.	OGRP06	2	34	.	.	17	19	18	16	24	17	18.5	15	18	13	12
186	OGRP06	1	29	3	2	24	26	30	17	29	16	23.7	24	20	19	14
187	OGRP06	1	36	3	2	18	20	17	16	26	17	19.0	15	18	16	15
188	OGRP06	2	.	.	.	18	25	26	14	18	16	19.5	16	19	24	20
189	OGRP06	1	37	3	1	18	35	19	25	28	10	22.5	25	13	14	13
190	OGRP06	2	40	3	2	16	46	24	16	25	12	23.2	19	24	21	12
191	OGRP06	2	56	3	2	18	18	18	18	17	15	17.3	14	13	25	21
192	OGRP06	2	36	.	.	22	18	15	17	23	17	18.7	16	26	16	20
193	OGRP06	1	44	3	1	32	16	13	25	32	18	22.7	17	20	17	25
194	OGRP06	2	40	.	.	27	32	33	27	20	16	25.8	15	12	10	12
195	OGRP06	2	.	.	.	18	20	20	22	19	18	19.5	15	26	29	31
196	OGRP06	2	29	3	2	15	16	12	14	16	10	13.8	26	10	21	10
197	OGRP06	2	.	.	.	20	30	27	20	41	11	24.8	14	18	27	22
198	OGRP06	1	27	3	2	25	25	23	19	27	28	24.5	16	22	20	19
199	OGRP06	2	29	3	2	26	25	26	29	29	25	26.7	23	34	18	26
200	OGRP06	2				17	24	16	17	29	11	19.0	18	17	18	22

T – Scores – Ghanaian Study

	psq	re	sc	ss	rc	prq	healthsr	numvsit
201	18.25	22	28	32	34	29.00	15	13
202	17.25	31	34	49	44	39.50	28	27
203	18.75	25	34	41	44	36.00	25	24
204	22.75	19	21	31	27	24.50	37	36
205	25.50	15	17	23	14	17.25	36	36
206	15.00	13	18	45	27	25.75	13	12
207	14.00	33	46	50	48	44.25	8	6
208	.00	0	0	0	0	.00	12	12
209	16.75	26	22	46	37	32.75	14	11
210	35.50	21	28	32	39	30.00	35	32
211	15.00	29	29	42	42	35.50	11	0
212	26.25	25	26	33	31	28.75	37	37
213	12.50	28	29	49	33	34.75	9	2
214	22.50	20	17	40	29	26.50	37	34
215	18.25	20	31	47	32	32.50	5	0
216	19.25	26	31	42	31	32.50	28	21
217	21.25	19	29	31	28	26.75	27	22
218	20.25	37	43	44	37	40.25	15	15
219	21.00	30	27	39	37	33.25	29	26
220	20.75	32	26	35	32	31.25	15	14
221	34.75	34	46	40	42	40.50	28	25
222	30.50	18	16	28	31	23.25	35	32
223	15.50	32	20	34	33	29.75	8	3
224	23.50	29	32	37	30	32.00	38	36
225	13.75	30	32	37	40	34.75	3	0
226	25.75	27	31	40	42	35.00	14	12
227	16.25	202	27	43	32	30.50	20	20

228	22.25	22	22	34	32	27.50	36	36
229	25.50	24	37	35	33	32.25	3	0
230	19.75	21	30	36	47	33.50	21	19
231	17.75	26	37	38	40	35.25	2	0
232	17.00	23	25	35	33	29.00	38	36
233	23.00	21	30	36	47	33.50	4	0
234	20.50	31	31	40	36	34.50	26	23
235	20.50	31	31	40	36	34.50	4	4
236	14.25	24	14	40	39	29.25	2	0
237	14.75	21	28	50	41	35.00	19	25
238	16.75	24	18	33	34	27.25	4	2
239	20.25	31	33	45	43	38.00	25	22
240	2.75	32	27	44	40	35.75	1	0
241	19.25	29	33	28	39	32.25	23	20
242	20.25	18	30	32	36	29.00	25	23
243	28.25	31	32	48	39	37.50	34	31
244	18.25	29	41	22	30	30.50	14	14
245	16.50	25	24	33	34	29.00	10	10
246	16.00	29	41	42	39	37.75	12	9
247	15.50	29	41	42	40	38	6	2
248	20.00	33	37	40	47	39.25	19	19
249	15.75	34	45	45	38	40.50	10	2
250	21.00	16	40	40	33	32.25	26	2
251	20.00	25	25	38	33	30.25	31	30
252	29.25	36	24	30	31	30.25	28	26
253	29.25	36	24	30	31	30.25	28	26
254	16.5	29	28	35	32	31.00	20	19
255	29.25	32	23	23	33	27.75	36	35
256	14.75	24	28	24	17	23.25	12	9
257	21.00	20	30	41	43	33.50	24	22

258	21.50	26	22	36	26	27.50	30	26
259	20.25	24	23	36	34	29.25	30	29
260	14.25	25	25	33	30	28.25	14	13
261	20.50	27	30	43	37	36.50	23	22
262	19.50	18	20	18	34	22.50	31	28
263	25.25	26	30	29	28	28.25	35	34
264	19.00	22	30	50	41	35.75	19	17
265	22.00	18	18	41	41	29.59	24	22
266	23.00	10	21	45	37	28.25	26	26
267	25.25	21	34	41	48	36.00	28	26
268	17.75	23	22	29	25	24.75	11	10
269	24.00	22	24	33	28	26.75	27	26
270	18.00	15	27	35	29	26.50	12	11
271	16.50	16	28	34	33	27.75	12	9
272	15.25	22	23	30	24	24.75	15	8
273	21.75	22	21	46	42	32.75	32	32
274	28.50	26	17	40	33	29.00	37	35
275	16.00	31	21	46	45	35.75	24	22
276	18.50	27	29	43	32	32.75	11	9
277	12.50	18	27	34	43	30.50	17	15
278	21.00	12	31	48	40	32.75	14	13
279	16.50	23	19	41	32	28.75	12	12
280	20.00	23	24	37	22	26.50	34	32
281	14.74	26	19	46	37	32.00	28	27
182	22.00	16	13	13	25	16.75	29	28
183	15.25	16	28	28	23	23.75	15	14
184	15.00	28	35	38	36	34.25	10	10
285	15.75	28	29	48	26	32.50	13	8
286	14.75	29	21	33	40	30.75	11	10
287	19.25	16	25	30	30	25.25	33	28

288	14.25	27	42	39	36	36.00	7	0
289	16.75	27	27	35	32	30.25	28	26
290	15.00	24	37	50	33	36.00	9	6
291	16.50	16	22	36	25	24.75	24	23
292	21.50	25	26	34	39	31.00	15	14
293	18.50	23	39	50	42	38.50	22	20
294	23.50	19	31	38	32	30.00	29	29
295	20.25	20	23	28	34	26.25	38	38
296	18.25	23	27	43	39	33.00	28	18
297	14.00	24	24	41	34	30.75	2	2
298	.00	0	0	0	0	.00	29	27
299	.00	0	0	0	0	.00	13	13
300	.75	0	0	0	0	.00	28	27
301	22.50	25	26	36	36	30.75	36	36
302	20.00	20	16	39	21	24.00	35	33
303	.00	23	32	46	40	35.25	2	0
304	15.75	0	0	0	0	.00	39	39
305	19.50	32	27	42	31	33.00	33	32
306	17.25	20	17	39	33	27.25	1	0
307	29.00	0	0	0	0	.00	37	36
308	.00	28	23	24	35	27.50	4	3
309	14.25	21	26	46	37	32.50	3	2
310	25.75	22	17	33	28	25.00	36	34
311	18.75	23	28	41	35	31.75	14	10
312	.00	21	19	29	32	25.25	2	0
312	15.50	32	27	23	21	25.75	10	7
314	.00	0	0	0	0	.00	8	8
315	16.25	22	34	38	39	33.25	12	10
316	25.50	29	37	40	38	36.00	30	26
317	13.75	25	43	50	48	41.50	4	3

318	21.75	20	22	46	23	27.75	19	18
319	27.75	24	21	39	30	28.50	37	37
320	.00	25	26	49	34	33.50	1	1
321	18.00	17	27	31	34	27.25	39	36
322	15.00	20	29	35	30	28.50	16	14
323	23.75	29	27	46	26	32.00	26	26
324	18.25	18	16	25	28	21.75	26	18
325	14.25	20	33	26	44	30.75	19	15
326	.00	33	29	30	32	31.00	4	0
327	.00	0	0	0	0	.00	23	14
328	17.00	0	0	0	0	.00	36	28
329	.00	0	0	0	0	.00	13	12
330	.00	0	0	0	0	.00	14	8
331	16.25	28	17	42	34	30.25	18	13
332	20.00	22	31	40	36	32.25	18	17
333	15.75	23	33	42	28	31.50	9	2
334	15.50	26	40	38	38	35.50	5	4
335	25.50	24	27	39	32	30.50	33	30
336	19.25	25	29	35	38	31.75	23	18
337	16.00	23	19	40	32	28.50	22	22
338	14.25	15	17	45	42	29.75	12	9
339	17.25	19	23	34	34	27.50	3	1
340	.00	0	0	0	0	.00	10	9
341	19.75	21	30	40	38	32.25	25	25
342	23.00	28	28	30	31	29.25	27	14
343	24.00	22	24	44	42	33.00	30	20
344	26.00	38	39	45	30	38.00	28	24
345	23.00	31	31	31	29	30.50	35	32
346	20.75	22	27	41	34	31.00	23	17
347	16.00	25	26	38	35	31.00	7	3

348	20.75	34	31	32	40	34.25	26	14
349	30.75	28	31	31	31	30.25	39	32
350	21.75	28	33	40	33	33.50	22	22
351	28.50	29	32	27	29	29.25	36	35
352	22.00	27	17	43	32	29.75	28	13
353	16.75	27	41	42	44	38.50	2	2
354	24.75	23	24	31	27	26.25	36	34
355	20.75	24	28	27	44	33.25	19	5
356	20.25	32	26	33	35	31.50	22	18
357	15.00	20	35	48	38	35.25	11	1
358	19.50	26	28	38	42	33.50	24	18
359	28.00	28	29	34	32	30.75	35	32
360	20.75	24	28	38	37	31.75	20	18
361	28.50	22	23	47	43	33.75	37	3
362	21.00	24	29	39	43	33.75	19	18
363	25.75	26	25	28	21	25.00	38	36
364	15.50	27	36	44	44	37.75	12	5
365	27.50	34	38	26	39	34.25	36	32
366	23.50	28	41	36	26	32.75	26	14
367	28.25	31	33	45	39	37.00	27	25
368	18.25	22	25	44	34	31.25	15	13
369	22.50	24	29	37	30	30.00	33	21
370	14.75	20	35	42	33	32.50	13	10
371	16.75	31	44	36	43	38.50	18	16
372	19.75	24	30	35	30	29.75	24	22
373	31.25	26	23	14	28	22.75	37	36
374	25.50	24	31	37	25	29.25	39	39
375	17.75	33	33	41	42	37.25	22	18
376	23.00	32	30	30	41	33.25	36	35
377	25.50	33	28	30	26	29.25	35	35

378	19.00	24	30	35	30	29.75	15	14
379	20.50	21	30	32	31	28.50	21	21
380	26.25	38	47	29	46	40.00	23	22
381	20.50	26	34	31	33	31.00	27	24
382	18.75	28	33	33	32	31.50	16	13
383	18.25	30	34	35	36	33.75	14	14
384	20.75	26	30	35	33	31.00	16	5
385	19.00	15	30	32	34	27.75	24	21
386	27.50	29	28	36	33	31.50	34	32
387	22.50	28	31	29	36	31.00	23	22
388	16.50	30	29	36	33	32.00	13	13
389	28.00	28	43	39	31	35.25	27	26
390	14.75	22	29	36	23	27.50	22	21
391	20.25	24	31	34	28	29.25	25	22
392	21.50	29	28	45	44	36.50	24	23
393	17.25	23	38	42	47	37.50	13	13
394	14.75	26	28	33	39	31.50	25	22
395	19.25	28	28	33	37	31.50	19	18
396	16.00	30	44	45	43	40.50	6	0
397	17.75	26	29	19	44	29.50	24	22
398	22.00	19	41	36	42	34.50	22	21
399	14.25	21	33	42	37	33.25	6	4
400	16.00	22	42	40	50	38.50	13	11
401	18.50	20	25	19	40	26.00	37	37
402	14.25	15	18	33	32	24.50	12	9
403	16.75	22	31	33	29	28.75	11	8
404	18.00	21	29	30	30	27.50	18	7
405	17.50	21	26	40	35	30.50	26	23
406	17.75	18	28	43	37	31.50	17	15
407	20.00	27	35	38	34	33.50	14	13

408	17.50	22	28	50	42	35.50	17	16
409	17.00	29	28	43	36	34.00	12	9
410	21.25	20	24	22	36	25.50	36	36
411	26.75	27	26	25	30	27.00	39	37
412	19.25	24	24	27	33	27.00	30	27
413	15.75	30	33	41	38	35.50	3	1
414	20.25	14	22	46	48	32.50	25	24
415	20.50	30	33	47	42	38.00	26	26
416	22.75	23	21	41	35	30.00	28	26