KOFORIDUA TECHNICAL UNIVERSITY

FACULTY OF BUSINESS AND MANAGEMENT STUDIES

DEPARTMENT OF SECRETARYSHIP AND MANAGEMENT STUDIES

OCCUPATIONAL STRESS AND ITS EFFECTS ON JOB PERFORMANCE: A CASE STUDY OF KOFORIDUA TECHNICAL UNIVERSITY

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NOVEMBER, 2023

DECLARATION

We, hereby declare that this submission is our own work towards the Higher National Diploma and that, to the best of our knowledge and belief, it contains no material previously published by another person nor material which has been accepted for the award of any other diploma of the University, except where due acknowledgement has been made in the text.

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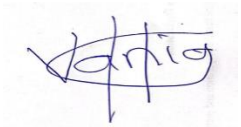

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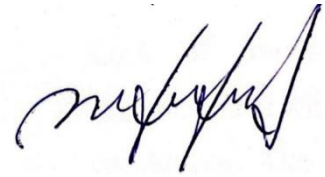
SUPERVISOR'S CERTIFICATION

We hereby certify that this project was supervised in accordance with the guidelines of supervising project work laid down by the university



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DEDICATION

We dedicate this work to our parents who remain our backbone in sponsoring this project and funding us through the educational journey in Koforidua Technical University.

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We highly acknowledge and appreciate almighty God for seeing us through the educational journey, again to my parents for the support both physically and emotionally. Another acknowledgement goes to my supervisor for the assistance that aid me to complete this study.

ABSTRACT

This comprehensive study, conducted at Koforidua Technical University, delves into the multifaceted realm of occupational stress and its far-reaching implications for job performance and overall well-being. The research sought to gauge the depth of knowledge and awareness regarding occupational stress among employees and to unravel the intricate interplay between stress factors, performance, and health. The findings are a testament to the prevalence and pervasive nature of occupational stress in the university workforce, with 135 (98.5%) of respondents exhibiting a high level of awareness about it. Workload emerged as a major stressor, identified by 76 (55.5%) of respondents, underscoring its significant impact. Additionally, 115 (83.9%) respondents reported experiencing signs and symptoms of occupational stress, ranging from headaches to fatigue, reflecting the multifaceted nature of stress. Importantly, 118 (86.1%) believed that occupational stress had a discernible impact on job performance, with 75 (63.6%) reporting reduced productivity and 29 (24.6%) experiencing low morale. The study further explored the effects of stress on health, with 122 (89.1%) acknowledging that work could affect their well-being, including 52 (42.6%) who suffered from back pain. The research also highlighted the prevalence of substance and alcohol abuse as a coping mechanism for stress. The majority, 96 (70.1%), were aware that prolonged exposure to stressors could lead to chronic health problems, specifically immune system dysfunction. Additionally, the study revealed that 50 (36.5%) believed there was a high possibility of past work stress contributing to current illnesses, emphasizing the need for comprehensive stress management strategies and support systems within the university setting. This research provides valuable insights into the complex relationship between occupational stress, job performance, and health, emphasizing the urgency of addressing these issues in academic institutions and workplaces more broadly.

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CHAPTER ONE

1.0 INTRODUCTION

1.1 Background of Study

Organizations have been deeply affected by occupational stress, which has impacted employees and other stakeholders. The conclusion drawn by occupational stress researchers, such as Cooper and Cartwright, 1994; Varca, 1999; Ornelas and Kleiner, 2003; is that many organizations face a significant issue. Occupational stress has become extremely costly in numerous organizations recently. The International Labour Organization (ILO) states that occupational inefficiency can cost up to 10 percent of a country's GNP (Midgley, 1996).

The concept of occupational stress refers to the awareness of a difference between environmental demands (stressors) and individual capabilities to meet these stresses (Topper, 2007, Vermut and Steensma 2005, Ornels and Kleiner, 2003, Varca, 1999). According to Christo and Pienaar (2006), occupational stress can be triggered by factors such as a sense of job loss, job security, prolonged sitting or heavy lifting, lack of safety, repetitive behavior, and lack thereof.

Lack of resources and equipment, late/overnight work schedules, and the organizational climate are all factors that contribute to occupational stress among employees. The occurrence of occupational stress can lead to high levels of dissatisfaction among employees, job mobility, burnout, poor performance, and less effective work relationships (Manshor, Rodrigue, Chong, 2003). Johnson (2001) contended that stress-related measures, such as identifying the signs of stress, determining their causes, and developing potential remedies, are necessary.

The study at Koforidua Technical University will aim to investigate the effects of occupational stress on job performance and suggest effective measures by management and personnel to manage stress. Additionally, A deeper comprehension of the variable can be achieved by focusing on the wider pressure topic and delving into it at Koforidua Technical university.

1.2 Problem Statement

The contemporary turbulent environment wherein some employee's behaviour their work requires that agencies study their practices. Operating at the tertiary degree is an inherently worrying profession with lengthy running hours, heavy workloads, difficult students and conflicting needs. The physical and psychological needs of employees at the tertiary stage of training cause them to more vulnerable to excessive levels of strain. The effects of strain are evidenced as improved mistakes in memoranda, high medical payments, lateness to paintings, low productiveness and elevated unwell leaves. No matter the extremely negative results of occupational pressure on the human body and paintings performance, many groups, with Koforidua Technical University no longer being an exception has no longer installed any concrete measures to cope with these strain-associated conditions that negatively affect productiveness. Furthermore, there has now not been a conscious establishment of a linkage among occupational stress and its bad effect on productiveness.

It's miles within the mild of those problems that this research seeks to carry to the fore the implication of occupational pressure on the general performance of institutions.

1.3 Objectives of the study

The objectives of this study are:

1 To look at the consequences of pressure on workers within the performance in their process.

2 To assess management capabilities for controlling and reducing pressure at work.

3 To assess the guide for those individuals who are affected by stress.

4 To assess how paintings related strain can affect the health of people.

Research Questions

Based on the objectives of the study, the specific research questions to which answers were sought are:

1 What factors contribute to low productivity among staff of Koforidua Technical University?

2 Are there any strategies which could be adopted to prevent or reduce stress among staff of Koforidua Technical University?

3 What can be done to help staff of Koforidua Technical University with stress related problems?

4 Does job stress have any effect on the health of Koforidua Technical University staff?

1.4 Relevance of the study

Stress management is crucial for the smooth operation of businesses since it aims to boost productivity by allowing for clearer work focus, greater memory, an improved immune system, and lower blood pressure. Little has been done in Ghana to analyze the impact of stress on job performance within businesses because occupational stress is not given the attention it needs. This study is significant because it will:

i. Raise managers' understanding of the need of providing the right environment for employees to manage their stress.
ii. The study has the potential to spark interest in the study of stress among Ghanaian employees among academics and students.

1.5 Organisation of the study

There are five (5) chapters throughout the overall study. While chapter two concentrates on various theoretical frameworks and reviews of related literature about the issue, chapter one provides a broad introduction to the field. The data collection approach is presented in chapter three. The study's data are analyzed, condensed, and presented in chapter four. The final chapter presents a summary of the results, draws a conclusion, and offers suggestions for how to deal with the issue under investigation.

CHAPTER TWO

2.0 LITERATURE REVIEW

THEORETICAL FRAMEWORK AND LITERATURE REVIEW

INTRODUCTION

This chapter reviewed literature with respect to the study. Issues considered in this section would include occupational stress and performance, role of managers and stress control, stress management at workplace and stress and health.

2.1 THEORETICAL FRAMEWORK

Theories assist us in comprehending underlying processes so that we may make an appropriate decision. Theories are "coherent groups of assumptions put forth to explain the relationship between two or more observable facts," according to Stoner and Freeman (2000). We can foresee what will happen in specific circumstances thanks to valid theories. No matter how well we understand a principle, the history and theories of any discipline enable us to apply it to real-world situations. The theories of stimulus-based, interactional, person-environment fit, role overload, and role theory are all pertinent to the study of occupational stress and its consequences on job performance.

2.2 THEORETICAL APPROACHES TO STRESS

Regarding the dynamic construct of stress, there are many different definitions and ideas. The idea that there are at least three different theoretical approaches to the concept of stress is supported by literature (Richard and Krieshok, 1989; Ryan, 1996; Trivette, 1993). Ghadially and Kumar (1987) attempted to organize all of these theories by arguing that there were at least three distinct orientations, which were (a) stimulus-based, (b) response-based.

3.2.1 Stimulus-Based

Sensitivity-based stress is described by Kahn (1986) as "external forces or conditions that are hypothesized or demonstrated to have negative (painfully damaging, incapacitating) effects on the organization of interest" (P.42). Theorists of stimulus-based stress contend that an individual's

environment has an impact on them (Derogatis and Coans, 1993; Larzarus and Folkman, 1986b; Meichenbaum, 1986). In essence, according to this paradigm, environmental stresses cause a stress reaction or stain in the body (Cox, 1978).

The ability of many categories of stimuli stressors to cause stress has also been established (Derogatis and Coons, 1993). These categories include (a) acute, time-limited stressors; (b) chronic intermittent stressors; (c) stressor sequences; and (d) chronic stressors.

2.2.2 Interactional

Both stimulus-based and response-based techniques are included in the interactional approach to stress (Cox, 1978; Richard and Krieshok, 1989). The stimulus-response interaction is another name for this idea (Greenberg, 1999). According to the interactional approach, personal and situational factors combine to cause stress (Ryan, 1996).

The interactional approach's proposed theoretical framework is supported by recent research. Through the use of route analysis, Fogerty et al. (1999) examined occupational stress, strain, and coping in four distinct investigations. For academics interested in examining factors connected to occupational stress, strain, and coping, Decker and Borgon (1993) also promoted an intersectional approach since they believe it "fully examines the individual's unique psychological experience of work." (p.477).

Cox and Mckay (1996) went beyond Cox's (1978) interactional approach to stress and suggested that there may be another way to look at stress. Transactional has been used to describe this notion (Greenbery, 1999). According to Folkman and Lazarus (1988 a, 1988b), the transactional method takes into account the stimulus, response, cognitive evaluation of the stressors, coping style of the individual psychological defenses, and social context.

2.2.3 Role Theory

According to Biggs et al. (1995), "over the last decade, human service agencies, in most Western economies, have undergone major organizational restructuring and redefinitions of professional rules" to provide the level of care anticipated.

One of the fundamental tenets of the role theory is that different occupational roles that people play may be stressful independent of what they really do for a living. This implies that stress associated with different work roles may be stressful for all employees.

Regardless of a person's actual career choice, Osipow and Spokane (1987) identified six professional roles as stressful. According to Osipow and Spokane (1987; Osipow, 1998), these six roles are (a) role ambiguity (b) role insufficiency (c) role overload (d) role boundary (e) responsibility (f) and (c) physical environment.

2.2.4 Person-Environment Fit

According to a survey of the literature, scientists have tried to explain the possible connection between stress, a person's environment, and themselves. According to one theory, strain will happen if a person's environment is not properly matched to them (French, Captan, and Harrison, 1982). More specifically, according to the interaction of several factors, a person's environment suggests that they are suited to work in particular professions.

According to theory (Pithess and Soden, 1999), P-E Fit "predicts that the magnitude of strain experienced by an individual is proportional to the degree of misfit between the individual and their occupation." According to French et al. (1982), people "vary in their needs and abilities just as jobs very in their incentives and demands." Folkman and Lazarus (1986b)

2.2.1 Role Overload

Role Overload (RO) is a measure of how well an individual can handle their responsibilities and how much their employment demands outpace their personal and professional resources. Role overload can cause an employee to feel "angry and frustrated toward persons believed to be responsible for the overload in work" (Osipow, 1998) (Marini et al., 1995).

Role Overload was found to have a weak correlation with stress among University of California employees by Decker and Borgen in 1993. According to Trivette (1993), both male and female tertiary education employees had average Role Overload scores. Trivette (1993) discovered that lecturers who worked at two or more schools experienced higher levels of stress. Furthermore, compared to working at just one school, working in two or more school environments was substantially associated with higher Role Overload scores. According to Aitken and Schloss (1994), the physical environment was acknowledged to be a major factor in the high level of role overload

experienced by tertiary educational professionals who worked with machines.

2.3 REVIEW OF RELATED LITERATURE ON OCCUPATIONAL STRESS

2.3.1Occupational Stress and Performance

2.3.1.1 Effects of Stressors on Job Performance

Researchers disagree widely about the direct and indirect impacts of many alleged stressors. Direct stress effects are those brought on by the work load alone, independent of any potential psychological stress. In light of this, indirect stress effects are those that result from psychological variables linked to task load demands. These two can occasionally be difficult to tell apart because of the thin line that exists between them. This has made separating them and measuring them quite challenging. The contradictions in the literature can be attributed to a number of problems. Is the application of a task requirement, such as a heavy workload or tight deadlines, a form of stress?

While many would assert that it is, others would say the opposite. One of two arguments is generally presented by those who favor the former. According to the first argument, any demand placed on a system can be referred to as stress. As a result, every task that puts a demand on the body's systems qualifies as a stressor. This reasoning fits the definitions of early stress (stimulus-based techniques), however it is no longer valid because accepted demands have indirect impacts in addition to their immediate ones. To put it another way, these expectations cause psychological reactions like dissatisfaction, worry, or discomfort.

This reaction frequently includes competing physiological and mental components. By directing them to secondary psychological processors in this manner. However, there is a strong case to be made that a task need does not necessitate or usually incur a secondary psychological cost. It is challenging to see how demand features on their own qualify as stressors when using the state definition of stress, which considers the interaction between three perceptions: a demand, the value of being able to cope, and the demand (McGrath, 1976).For instance, time constraints and/or a heavy workload often cause worry or dissatisfaction, which can further detract from or impair performance. However, it is unclear if this would be the case in the majority of circumstances, let alone all of them.

When determining whether workload, time constraints, or other purported stressors have both direct and indirect effects, one must assume that subjective experience, and more specifically cognitive appraisal (a transactional model assumption), plays a significant role. Does this mean that when a demand is considered unpleasant or distressing, even when it is performance-related, the operator would likely consider it a stressor? Both viewpoints can be supported by valid reasoning, and the research literature as it stands today reflects this reality. Although it is possible to claim that each "stressor" has direct impacts, they may all also have indirect effects. The amount of time available to complete a work, for instance, is constrained by time pressure. This limit is a physical restriction, thus comprehending how it directly affects performance does not necessitate an explanation from psychology. But frequently, this restriction causes a commensurate psychological response, such worry, which has second- or third-order consequences on performance. The research community has had trouble distinguishing between these two dimensions.

Given the inherent difficulty in doing so, research that tackles numerous alleged stressors covered in the review (such as workload, time constraints, heat and cold, noise, and weariness), rarely distinguishes between these two dimensions. Because of this, direct and indirect effects of these factors are discussed together in this review without being explicitly differentiated.

2.3.1.2Effects of Workload on Job Performance

By relying solely on workload descriptions and neglecting possibly related psychological stress, a number of researches have attempted to avoid the interrelationship between direct and indirect impacts (Hancock & Desmond, 2001). By doing this, they have avoided having a straight conversation about stress and how it affects or improves performance. However, by ignoring this problem, these authors have left it up to the reader to decide whether or not a stress impact was inferred in many cases. The studies' aim is to inform the reader of this problem rather than try to fix it.

Workload is a fictional concept that represents the expense experienced by a human operator to attain a specific level of performance, according to Andre (2001). (p. 377). Kahneman (1973) defined workload as "...the proportion of the capacity an operator spends on tasks performance" and believed it to be a major cause of resource depletion. It is described as "an intervening variable that modulates the tuning between the demands of the environment and the capabilities of the organism" by Kantowitz and Simsek (2001).

Due to its theoretical character, they stated that this variable "cannot be directly observed but must be inferred from changes in performance." (p. 405). According to Gorpher and Donchin (1986), the main function of workload as a concept is that it is "...viewed from the perspective of some assigned tasks." Last but not least, Wickens (2001) liked Moray's (1979) concept of mental burden, which he described as "...an inferred construct that mediates between task difficulty, operator skill, and observed performance." (pp.443) These workload definitions resemble early theories of stress as a relationship between demands and available resources (the stimulus-based approach).

The absence of any explicit cognitive function, such as assessment, is the most glaring aspect of this. However, one shouldn't assume that workload merely refers to the requirements of a certain task. Contrarily, the prevalent viewpoint in the field mentioned above offers plenty of evidence that workload is thought to be considerably more than that. Unfortunately, once a researcher moves beyond the term's most basic definition, confusion over its meaning quickly spreads.

The authors defined task load as what the work or tasks bring as environmental loads on the organism or system while workload concerns what is experienced by the organism or system as it attempts to adapt accordingly. These two sets of definitions illustrate the continued overlap between direct and indirect stress effects in the research literature.

Hilburn and Jorna (2001) made a distinction between workload and task load in response to this

misunderstanding. They proposed that workload should be understood as the individual's subjective reaction to the demands placed on them by the task at hand. In their dynamic and adaptive workload model, Parasuraman and Hancock (2001) made a similar distinction: "Workload may be driven by the task load imposed on human operators from external environmental sources, but not deterministically so, because workload is also mediated by the individual response of human operators to the load and their skill levels, task management strategies, and other personal characteristics" (p. 306).

An information processing model of operator stress (defined by time pressure) and performance was presented by Hendy, Farrell, and East in 2001. According to these authors, time pressure is the primary stressor that affects operator performance, error production, and workload assessments. In fact, all variables impacting workload, according to Hendy et al. (2001), are condensed to this variable. For the theoretical calculation of the link between any given job load and its accompanying time pressure, these authors have suggested the following algorithm:

Task load ÷ processing rate = decision time Decision time ÷ available = time pressure.

Hendy et al. suggest three possibilities by which human information processing can reduce information processing load mismatch. The first is a reduction in task load or the amount of information. The second is an increase in the time available to complete the task, and the third is an increase in channel capacity (regulating the rate and volume of information processing). Hendy et al. are certainly not alone in their alignment of time pressure and workload. O'Donnell and Eggemeier (1986) also drew a direct connection between workload and time pressure which they believed was likely to lead to load-shedding.

2.3.1.3 Measurement of Occupational Stress and Workload

To define any phenomenon, according to Muscio (1920), one must first be able to measure it. As a result, there must be a legitimate and trustworthy tool for measuring; nevertheless, it is challenging to develop such a tool without first understanding what you are attempting to measure. Due to this conundrum, some researchers have come to the conclusion that it would be more practical to pursue task-demand metrics, while others have made the decision to focus on the nebulous concept of stress itself.

Gopher and Braune (1984) discussed the use of arbitrary workload metrics. Their analysis of the literature in this area revealed that there is no consensus. Some studies showed a very good correlation between subjective evaluations and objective measures, while others showed a very modest correlation.

For instance, Zeier (1994) observed a substantial association between workload and cortical release while Shostak and Peterson (1990) found no significant correlation between physiological arousal brought on by mental arithmetic and self-reported emotions of anxiety. According to Krausman, Crowell, and Wilson (2002), physiological arousal measurements were found to correlate with both the impression of exertion and declines in cognitive performance.

Stokes and Kite (2001) have advised against assuming that physiological signs are inevitably connected to stress due to the uneven relationship between objective and subjective assessments. We may never be able to develop a scale for mental workload similar to kilocalories per minute in terms of its usability, generality, and formal measurement features, according to Kantowitz and Casper's (1988) prediction. (p.164).

Following the work of Cacioppo and Tassinary (1990), who addressed the potential issues that emerge when integrating physiological and other data together in causal linkages, Back (2001) modeled physiological markers of workload (heart rate and respiration period). They draw the

conclusion from their analysis that scientists in many domains want to use physiology as a quantifiable indicator of the status of the body.

They do, however, issue a warning that there are a variety of potential causal explanations when there is a connection between a process or event and an accompanying physiological change. Furthermore, correlations are rarely provided with their underlying causal explanations. Even more uncommon is the finding that psychological variation can be accurately predicted by physiological variation.

These authors provide a structure to aid in developing such connections. This framework is made up of different categories of psychophysiological relationships, each of which is incorporated into a multidimensional matrix made up of movable, temporal, particular, and general related elements. This matrix can be used to investigate a particular relationship, such as the one between papillary dilation and workload. According to Cacioppo and Tassinary's approach, the associations could be described as contemporaneous and corollary, for instance, if increased pupil dilation happens with increasing effort. If pupil dilation did not consistently rise as effort rose or if it varied between settings or people, for example, the relationship would be described in a different way. In an effort to account for all potential links, from those thought to be unconnected components to those that are causative in character, the authors' approach allows context-specific relationships across a variety of dimensions.

In their investigation of various methods for measuring mental workload, Hancock, Mechkati, and Robertson (1985) noted, the central nervous system's (CNS) activity is likely influenced by mental workload; different measurements may reveal processes like an increase in energy requirements, system deterioration over time, or homeostatic mechanisms in effect. crafted to restore the balance of the system that these cognitive task requirements have upset.

These authors defined mental workload as the outcome of intentional CNS activity. Beatty (1982)

discovered evidence demonstrating a strong correlation between pupil dilations and changes in information processing and, possibly, enhanced resource mobilization (changes corresponded with increases in task difficulty).

According to Hancock and colleagues (1985), there are two important variables to consider when measuring mental workload. The first is concerned with how practical the task is under working circumstances. The proximity of the measurement to the location of the mental activity is the second dimension, which deals with spatial and systemic congruence. These authors examined the research findings related to the following covariates in their analysis of various physiological measurements: auditory canal temperature, event-related potentials, flicker fusion frequency, critical fusion frequency, galvanic skin response, electrocardiogram, heart rate variability, electromyography, muscle tension, electroencephalographic activity, eye/eyelid movement, papillary dilation, respiration analysis, and body fluid analysis. Event related potentials, which were the closest to the location of mental activity, were found to have the highest spatial congruence of these measurements and to be the most practically useful, whereas heart rate variability was found to have the highest spatial congruence and be the most practically useful.

It should be noted that these authors did not demonstrate the relative predictive quality of these measures, did not attempt to independently validate these measures experimentally, and did not attempt to independently validate these measures.

Task performance, subjective report, and physiological data were listed as the three main forms of measuring information in the field of transportation human factors by Brookhuis and de Waard (2001). The SWAT (subjective workload assessment technique) and the NASA-TLX (task load index) were determined to be the most often utilized self-report indices of mental workload during their study of measuring instruments.

Additionally, they stated that the electrocardiogram—which measures heart rate and heart rate variability—was the physiological data point that was most frequently employed. Additionally, they discovered that catechumens' blood tests and brain activity measurements (electroencephalography) have emerged as trustworthy covariates of mental exertion. The authors claim that this data is consistent with the idea that such metrics can be used as indicators of mental effort put forth during task execution.

In order to avoid the construct's inherent complexity, Andre (2001) recommended the measurement of task demands over stress in general. He provided a list of several workload measurements.

2.3.1.4 The Effect of Occupational Stress on Attention

Attention, its function in allocating resources, as well as its selective nature, have already been briefly mentioned in the previous section. I'll go over a number of studies on the impact of stress and workload on attention in the conversation that follows.

Generally speaking, while under stress, attention tends to channel or tunnel, lowering concentration on other activities and information, and increasing focus on the primary job.

Whichever stimulus is thought to be of the greatest relevance to the person or that which is thought to be the most salient appears to determine what distinguishes a primary task from a peripheral task. Salience is thought to have a strong relationship with threat-relevance. As a result, individuals frequently judge such stimuli to be the most important when they are associated to a threat.

As one might expect, depending on the circumstances and the nature of the activity, this tunneling of attention can lead to either improved or decreased performance. For instance, the capacity to tune out peripheral stimuli that are unrelated to task completion is likely to enhance performance. On the other

hand, performance worsens when these supplementary cues are relevant to the task and their adoption would otherwise enhance success on the task.

2.3.1.5 The Effect of Occupational Stress on Memory

Working memory functions are hampered, according to the study literature on how stress affects memory consistency. It appears likely that encoding and maintenance processes are the most impacted, despite the fact that the mechanisms underlying these effects are poorly known.

Some have conclude that this indicates a decrease in resource capacity. Resources may be lowered or removed altogether, their access time may be shortened, or they may be diverted due to resource showing (the consumption of resources by competing demands).

Furthermore, little is known regarding the stage of the process at which this occupancy or depletion occurs. At different stages of the process, such as encoding, rehearsal, or retrieval, it's possible that resources or capability are diminished. Few, if any, research have attempted to distinguish between these dimensions within stress-related memory processes.

2.3.1.6 Effects of Occupational Stress on Memory Overload

A quick review of memory (especially working memory) is essential before delving into the potential impacts of various stressors on memory function and performance. Memory has long been thought of as a multi-component system that consists of a short-term or working memory component as well as a long-term memory store.

According to a working memory model put forth by Baddeley in 1986, people have a finite amount of working memory resources that they can use to compete for a variety of activities. Thus, divided attention or dual jobs deplete this pool, leaving less time or energy for any one work. A central

executive and two slave systems—an articulator loop and a visuospatial aketch pad—each specializing in language- and spatial-related information—make up Baddeley's proposed tripartite model of supervisory control over memory.

While the primary executive function is currently not well characterized. The major function of working memory appears to be the preservation of a limited fraction of long-term memory in an easily accessible state, according to Baddeley's description on page 486.

Baddeley's Working Memory

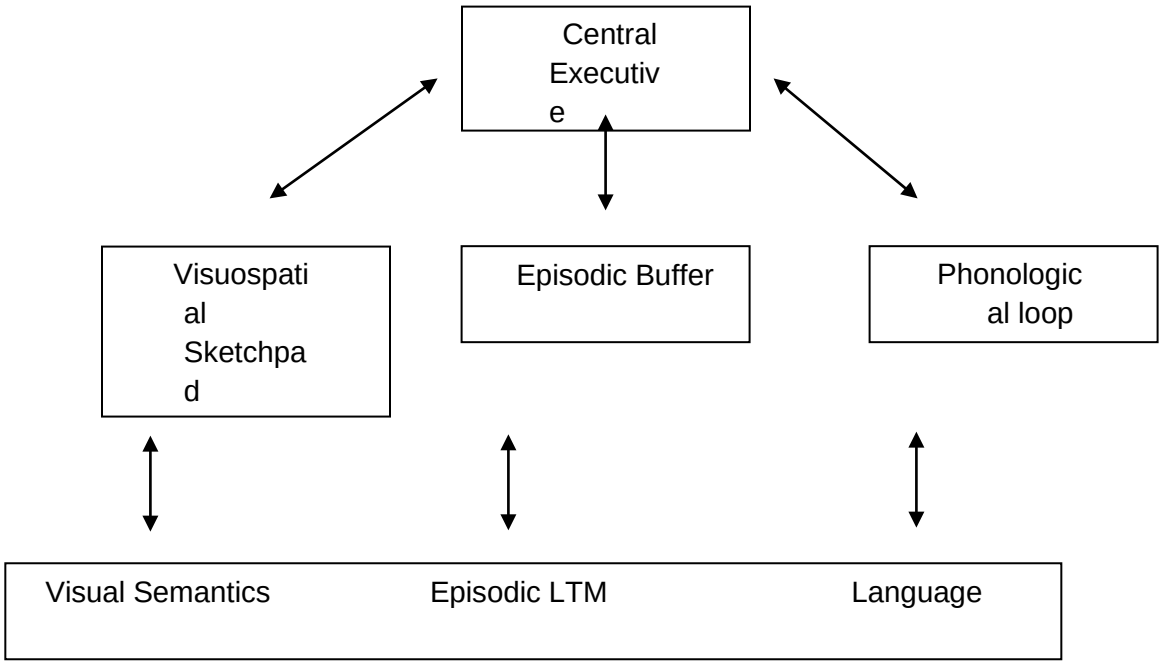

Figure 1: the figure above represents Baddeley's current model of working memory (Baddeley, 2002).

2.3.1.7 Effects of Occupational Stress on Memory and Anxiety

Memory under stress has been assessed in a variety of tests. To be more specific, these studies have typically focused on working memory, and the reader should take general references to memory as references to working memory unless otherwise stated in the text (many of the studies discussed in this review fail to make this distinction clear).

Long-term memory often holds up under pressure, but other aspects of working memory are more susceptible. According to memory researchers, anxiety is arguably the most prevalent form of stress (Eysenck, 1979, 1985; Wachtel, 1968). There are many ways to cause anxiety, but not often through poor math ability. It is generally known that this stressor has a deleterious impact on working memory (Ashcraft, 2002; Ashcraft & Kirk, 2001; Eysenck, 1992; Eysenck, 1997).

According to Ashcraft and Kirk (2001), people who are anxious tend to process different components of mathematical functions more slowly and deliberately. For instance, these people appear to struggle particularly with the carry-over function, which involves adding a column of numbers that add up to more than nine. Given the connection between working memory and his function, researchers theorized that the extra anxiety present in highly anxious subjects probably diverts resources away from working memory that could otherwise be used for activation and rehearsal (such as that required for the carry operation).

Although it has been suggested that people with high math anxiety may simply be less skilled mathematicians (deficits owed to ability and not worry per se), numerous analyses have shown that arithmetic proficiency is insufficient to explain the phenomenon. 1990's Hembree. Research has instead focused on developing our understanding of resource depletion models.

It has been argued that concern and intrusive thoughts fight for a little amount of resources. The principal objective, in this case a mathematical calculation, has fewer resources available as a result of

the competition. This viewpoint is known as the "processing efficiency theory," and Eysenck and Calvo (1992) suggested that extremely worried people typically exhibit reduced cognitive efficiency as a result.

In their investigation of the impact of math-related anxiety on the performance of several cognitive tasks, Ashcraft and Kirk (2001) predicted that math anxiety would impair working memory, resulting in a decline in mathematics and related performance. These authors specifically assessed the level of math anxiety in their subjects using a self-report index called the Short Mathematics Anxiety Rating Scale, and then they evaluated their performance using two working memory tests, the computational span and the listening span.

Their findings imply that those who score highly on tests of math anxiety typically perform poorly on tests of working memory. Highly anxious subjects were more likely to show deficits in computational scores than listening scores, albeit this was true across the board (and not just for computational tasks).

The researchers concluded that arithmetic anxiety reduced working memory capacity. In a follow-up experiment, they tested their theory using an online mental arithmetic exercise with varied degrees of difficulty and time constraints. These were coupled with a different job as well. The presumption of resource rivalry served as the basis for the study of dual-tasking. The authors proposed that working memory capacity should be reflected in error rates or decreases in response time. As a result, they combined their initial addition job with a memory exercise that required individuals to keep two or six randomly generated letters in mind.

The respondents who expressed the most math-related anxiety performed worse than the subjects who expressed low to moderate levels of anxiety. Carry operations—using the tens column in addition

tasks—were shown to be particularly challenging for math-averse subjects. The presence of nonnumeric stimuli did not reveals these deficiencies.

2.3.1.8 The Effects of Stress on Judgment and Decision Making

Decision-making and judgment are distinct processes with unique results, and researchers have different ways of describing these two ideas. One could argue that judgment, an action-based response, is what leads to decision-making. While others have described its function in information processing (Deutsch & Deutsch, 1963; Deutsch & Pew, 2002; Keele, 1973) and as part of the larger cognitive architecture (Leiden, Laughery, Keller, French, Warwick, & Wood, 2001; Neufeld, 1999), many authors have attempted to describe and model the process of decision making (Hammond, 1980; Speed & Forsythe, 2002).

Regardless of how these two concepts are finally defined, most people think of them as being connected and related. Additionally, they are sometimes seen as the culmination of the earlier processes (such as attention, memory, and cognitive appraisal) mentioned. Do the impacts of stress on judgment and decision-making go beyond the accumulation of its lower-level effects on cognition, memory, and attention? While it is obvious that judgment and decision-making are affected by stress, it is unclear whether they reflect these earlier decrements carried to their logical end or whether they are also prone to additional stress effects on their own.

There are various methods to categorize the research in this field.

According to many studies (Broder, 2000; 2003; Dougherty & Hunter, 2003; Janis, Defares, & Grossman, 1983; Janis & Mann, 1977; Keinan, 1987; Streufert 1981; Walton & McKersie, 1965; Wright, 1974), judgment and decision-making under stress generally tend to become more inflexible with fewer alternatives evaluated. Furthermore, it has been shown that people frequently rely on past

reactions, regardless of how effectively they worked in the past (Lehner, Seyed-Solorforough, O'Connor, Sak, & Mullin, 1997). This is especially true when those responses are well-known and learned.

Therefore, in addition to exhibiting increased rigidity, people may also have a tendency to stick with a method or approach to problem-solving even when it is no longer effective (Cohen, 1952; Staw, Sandelands, & Dutton, 1981). The study had opted to offer findings regarding individuals first, followed by research on teams and groups, for the sake of organization.

In line with other sections, the research on teams and groups came after the general conclusion regarding individuals. Similar to other sections, more specific dimensions are offered after the broad findings. An overview of decision theory has been given before a discussion of the impacts of stress.

2.3.1.9 Effects of Stress on Individual Judgment and Decision Making

Individual judgment and decision-making generally suffer under stressful circumstances. What exactly is degraded and how is less obvious and is a far more complicated problem. Stress, according to the argument, can cause hypervigilance, a condition of chaotic and ad hoc purposeful processing. The first to codify these facts under their decision-conflict theory was Janis and Mann (1977).

This hypothesis contends that hypervigilance causes a reduction in the quantity and quality of alternatives investigated as well as a frenetic search and quick intentional change. In the end, this condition impairs one's ability to judge and make decisions.

2.3.1.10 The Effects of Putative Stressors on Job Performance

Putative stressors including workload, heat and cold, noise, and fatigue have already been briefly

mentioned in previous sections (e.g., attention, memory). They also include heat and cold, noise, and time pressure. There are, however, sizable amounts of scholarship that concentrate specifically on each of these factors separately. I reviewed the research that underlies the key findings about the contribution of each "stressor" to performance in the parts that came before. The relevant portions of this review have already been provided in the preceding section, but additional research that specifically addresses these stresses is also presented. Researchers disagree widely about the direct and indirect impacts of many alleged stressors. Direct stress effects are those brought on by the work load alone, independent of any potential psychological stress. In light of this, indirect stress effects are those that result from psychological variables linked to task load demands. These two can occasionally be difficult to tell apart because of the thin line that exists between them.

This has made separating them and measuring them quite challenging. The contradictions in the literature can be attributed to a number of problems. Is the application of a task requirement, such as a heavy workload or tight deadlines, a form of stress? While some would claim that it is, others would claim the opposite. One of two arguments is generally presented by those who favor the former. According to the first argument, any demand placed on a system can be referred to as stress. As a result, any task that puts a demand on the system and calls for mental resources qualifies as a stressor. This argument satisfies the requirements of the early definitions of stress (stimulus-based approaches), but it is no longer as widely accepted because stress is now widely perceived as being transactional in character. The second argument suggests that in addition to their immediate impact, demands have psychological costs. To put it another way, their expectations cause psychological reactions like dissatisfaction, worry, or discomfort. This reaction frequently includes competing physiological and mental components. Stress serves as a secondary workload element in this way, diverting resources from the main demand and allocating them to secondary psychological processes.

However, there is a strong case to be made for workload as a requirement that does not necessitate or routinely involve a secondary psychological cost. It is challenging to understand how demand features on their own can be considered stressors when using the stated definition of stress, which is the interplay between three perceptions: a demand, an ability to cope with that demand, and the importance of being able to cope (McGrath, 1976).

For instance, time constraints and/or a heavy workload may occasionally cause worry or irritation, which may further detract from or impair performance; however, it is unclear whether this would be the case in the majority of cases, much alone all of them. When determining whether workload, time constraints, or other purported stressors have both direct and indirect effects, one must assume that subjective experience, and more specifically cognitive appraisal (a transactional model assumption), plays a significant role.

Does this imply that demands that are regarded stressful or unpleasant are always stressors, regardless of the outcome? Does it mean that a workload increase that does not affect performance but is seen by the operator as stressful should be classified as a stressor? Both viewpoints can be supported by valid reasoning, and the research literature as it stands today reflects this reality. As the reader has previously noted, a number of researchers have sought to avoid this problem by focusing just on task load descriptions and omitting any potential psychological stress that may be present. By doing this, they have avoided having a straight conversation about stress and how it affects or improves performance. But by ignoring this problem, these writers have left it up to the render to infer a stress impact, whether that inference is accurate or not.

The study's goal was to raise reader awareness of this problem rather than seek to address it. I try to offer a conceptual framework that, in my opinion, offers more coherence than is apparent in the literature at the conclusion of this review.

2.3.1.11 The Effects of Occupational Stress on Workload

Early theories of stress (Cannon, 1932; Selye, 1950) regarded the idea and the human body as mechanical systems. When demands exceeded available resources, stress was frequently considered to be present. A stress effect was perceived as the resultant "strain" on the system. Stress was still conceptualized as an imbalance between environmental demands and the organism's capacity to effectively respond to those demands, notwithstanding the addition of a cognitive component by later theorists (Lazarus, 1966).

This kind of oversimplified duality made it easy to label workload and other factors as "stressors." For instance, it is well known that more resources are needed to maintain performance as task volume increases. This fact alone, in accordance with past theories of stress, illustrates the similarity between the two ideas. Many in the research immunity today still consider factors like workload and stress-related, despite the fact that this relationship is far from universally accepted.

Although some have refrained from making the association between workload and stress, instead focusing solely on descriptions of the task demands (Hancock & Desmond, 2001), this has proven challenging due to the disparity in research approaches. For instance, Parasuraman and Hancock (2001) distinguished between workload and task load, claiming that workload was the experience of that loading by the organism as it tried to adapt to the environment. Task load, on the other hand, was the burden placed on the organism by the environment.

These descriptions bring to mind the contentious distinction between the direct and indirect consequences of stress. The discrepancies between researchers are likely to mislead readers because one investigation's stressors are another's task loads. Given the differences among researchers in this field, the discussion of workload components that follows has been presented.

Readers should be aware that this critic didn't find much. If there is any discussion in earlier reviews or in the source literature that supports the relationship between purported stressors and psychological stress.

The majority of global human connection includes the dynamic and complex handling of numerous tasks. Certainly, interactions between people and machines support this. Therefore, it is not a coincidence that a considerable percentage of the literature on human performance has historically focused on examining specific potential stressors that are removed from their contexts. Unfortunately, these studies do not adequately reflect the nature of the world we live in, despite how useful they are to our collective understanding of diverse systems and how they interact. As a result, studies that look at how well people multitask are particularly interesting.

However, studies specifically linked to concurrent task management that were not previously addressed are discussed below. A large portion of this study literature has already been evaluated under prior sections on attention and memory.

According to Hitch & Baddeley (1976), Kahneman (1975), Neisser & Becklan (1975), and Shafer (1975), concurrent task management typically leads to decreased performance on either the primary or secondary task. It should be emphasized that separating a primary task from a secondary task is rather arbitrary across research in the experimental literature. Simply put, multiple jobs divide available resources among themselves in the limited resources model, and under high workload or stress conditions, there typically aren't enough resources to accomplish both tasks at once. Shafer (1975), Neisser & Becklan (1975), Kahneman (1975), Hitch & Baddeley (1976), and others claim that managing multiple tasks at once often results in subpar performance on either the primary or secondary job. It should be stressed that the division between a primary goal and a secondary task is often somewhat arbitrary in experimental literature study. In the limited resources model, several jobs share available resources among themselves, and in conditions of high workload or stress, there often aren't enough resources to complete both tasks simultaneously.

For instance, Wickens and Dixon (2002) proposed three theories of concurrent task demands, single channel, single resources, and multiple resources. This is in contrast to Broadbent (1958) and Treisoman (1969) early selection theory, which postulates a single-channel information processing bottleneck in structural theory (occurring at the point of perception).

The multiple-resource model received the strongest amount of support from the authors. One of the pioneers of the many resources model was Wickens (1991), who chose to use a concurrent tasks management example to illustrate the paradigm. According to this source, the effectiveness of concurrent task management may be influenced by three different aspects. The first was confusion, which is described as a circumstance in which more distinct tasks degrade performance less frequently than similar tasks, which frequently interfere with performance.

He called cooperation the secondary possible result. When high task similarity produces combined results (such as tracking a ball as you get ready to whack it with a racquet), task processes are working together. Finally, he suggested requests might compete with one another. Resources from the other task(s) being managed decrease as a result of competition for task resources, notably when resources are allocated to one job in comparison to another. According to Wickens, time sharing cooperation across activities improves to the extent that they employ independent as opposed to shared resources. The search that is being examined here mostly corresponds to the ideas of conflict and rivalry between ongoing tasks. In 1992, Driskell, Mullen, Johnson, Hughes, and Batchelor conducted a meta-analysis of research examining the performance of dual tasks. The performance on the primary task tends to degrade when people try to accommodate a secondary task, according to their findings (across a number of stressors, such as temperature, noise, time pressure, etc.; a moderate effect size was identified).

The authors discovered that the interference and performance on the primary task increased with the

similarity of the two tasks. As a result, performance did not suffer as much when managing different tasks. Both Finkelman and Glass (1970) and Boggs and Simon (1968) noted comparable differential effects with noise exposure. According to McLeod (1977), performance on a tracking task was worse under high response similarity situations when both responses were manual as opposed to low response similarity conditions. It can be anticipated that psychologically stressful settings will degrade the management of resources further, diverting them from one or both activities, even though very little study appears to have been done on concurrent task management under such conditions.

2.3.1.12 Effects of Time Pressure on Job Performance

It has been discovered that time constraints hurt performance in a number of cognitive domains. Under time pressure, it has been discovered that a variety of performance domains suffer, including: Decision-making and judgment (Entin & Serfaty, 1990; Raby & Wickens, 1990; Rothstein & Markowitz, 1982; Sperandio, 1971; Stokens, Kemper, & Marsh, 1992; Walton & Mckersie, 1965; Zakay & Wooler, (1984), visual search patterns, alertness, and attention mechanisms (Streufert & Streufert, 1981; Wickens, Stokes, Barnett, & Hyman, 1991; Weight, 1974), Memory recall strategies (Cambell & Austin, 2002), concession making and integrative agreements (Pruitt, 1981; Pruitt & Canrnevale, 1982; Rubin & Brown, 1975; Walton & McKersie, 1965), and subject‘s self-rating of performance (Greenwood-Ericksen & Ganey, 2002).

In addition to a general decline in performance, time constraints and the corresponding sense of urgency are known to lead to task-or or load-shedding (of which strategy-shifting may be seen as one specific example), tunneling of attention and visual scanning, and a speed or accuracy trade-off in performance.

Some claim that time constraints are the root cause of all performance declines and that any factor that affects an operator's workload does so via this variable. Time pressure is a key component of the

information processing model of operator stress developed by Hendy, Farrell, and East (2001). According to these authors, the primary stressor that affects operator performance, error production, and workload assessments is time constraint.

In actuality, all variables that affect workload are condensed to this one, according to Hendy et al. Furthermore, the authors propose that the task load can be divided by the rate of information processing to assess the relationship between a given task load and its corresponding time pressure. The decision time required to control the load is calculated using this equation.

This amount is further divided by the amount of time that operators have to solve equations, leaving a numerical function that represents the pressure of time. According to the authors, there are three ways that human information processing can lessen load mismatch. The first is a decrease in the number of tasks or the volume of information that needs to be handled.

The second is an extension of the time allotted for completion, and the third is an expansion of channel capacity, which controls the volume and rate of information that must be processed. The second is an extension of the time allotted for finishing the assignment, and the third is processing. The third is an increase in channel capacity (which controls the rate and volume of information processing), followed by an increase in the amount of time available to complete the activity. Hendy et al. are undoubtedly not the only ones who connect time constraints with workload.

It was also established by O'Donnel and Eggemeier (1986) that these two variables were directly related. According to these writers, workload and time constraints are the main factors that cause load-shedding. This viewpoint appears to be further supported by the earlier discussion of shedding methods (Raby & Wickens, 1990; Rothstein & Markowitz, 1982; Sperandio, 1971).

By simply not having enough time to process information, respondents were compelled to simplify their decision-making tasks by doing fewer visual scans and taking into account fewer decision-

related alternatives, according to Wright (1974), who discovered that time constraints contributed to a state of information overload. Subjects were given a secondary job while under time constraints by Entin and Serfaty (1990).

The researchers discovered that when faced with challenging decision-making tasks, participants preferred to have additional information from a consultant's simple assessment rather than simply erasing raw sensor data. This was especially true when the workload and time constraints grew. This pattern of performance also illustrates how pre-processed data is frequently used in resource-saving or resource-shedding tactics.

It is unknown to what extent these "strategy-shifts" are driven solely by worry and how much they reflect the practical constraints of time.

A 1997 study by Lehner, Seyed-Solorforough, O'Connor, Sak, and Mullin looked at how well people make decisions when under time constraints. They discovered that when time constraint grew, teams adopted less-effective decision-making techniques. In particular, they employed techniques that were more comfortable for them rather than those that were superior and more recently taught. This research establishes a connection between our under-stress reliance on prior knowledge and our preference for using tried-and-true tactics, regardless of their efficacy.

Research has demonstrated that well-learned and regularized information sets tend to be resistant to the detrimental impacts of workload and stress, therefore in some circumstances, these characteristics may be considered as adaptive.

Ben Zur and Breznitz (1981) showed that when respondents were under time constraint, they tended to make lower risk decisions and spend more time viewing negative dimensions. In their decision-making task, people tend to emphasize the negative evidence, according to Wright (1974). Time constraints were studied by Greenwood-Ericksen and Ganey (2002) in relation to how individuals

rated their own performance under time constraints.

The authors discovered that, even when there was no difference in objective performance, people tended to judge themselves less favorably under time constraint than those who were not. Time constraints may lead some people to actively digest their unfavorable situations, in addition to making them negatively perceive their capacity to control these circumstances.

Finally, it has been noted that forced cooperation may result in the development of interactive agreements (Pruitt, 1981; Pruitt & Carnevale, 1982 & Brown, 1975; Walton & McKersie, 1965). However, several researchers have concluded that time pressure increases the level of cooperation between groups in negotiation because it facilitates concession making.

In their meta-analysis of the effects of time pressure on performance, Driskell, Mullen Johnson, Hughes, and Batchelor (1992) found that time pressure has a negative impact on performance speed (across a variety of cognitive domains) and accuracy (although the size of the effects is much larger for speed than accuracy). These scientists also concluded that the type of modification used mediates the effects of time pressure.

For instance, categorical manipulations (directing subjects to work as quickly as possible from the start) created mild to moderate increases in speed and actually enhanced performance accuracy slightly, whereas continuous manipulations (shortening the amount of time available for the task) produced strong negative effects for both speed and accuracy. It makes sense that the greater the pressure an individual face, the more accuracy is hampered by ongoing manipulations. No magnitude effect on categorical modifications was discovered by the authors. According to Driskell et al., pushing someone while they were pressed for time had an impact on how well they performed. When under pressure, there were significant negative consequences for both accuracy and performance speed for continuous manipulations.

The authors conclude that tasks like pattern recognition tasks proved to be a factor in how time pressure affected performance. The greatest detrimental effects on performance accuracy were seen in vigilance and response tasks, whereas the most beneficial effects on performance speed were seen in pattern recognition, reaction, and to a lesser extent cognitive task.

2.3.1.12 Effects of Thermal Stress (Heat and Cold) on Performance

Different cognitive processes seem to be hindered by thermal stress (heart and cold), and this impairment seems to be correlated with the severity of these threescore. When its chilly outside, cognitive deficits seem to be more common than heart problems.

The majority of the study literature in this field has evaluated sophisticated cognitive tasks, to a much lesser extent psychomotor and/or perceptual-motor tasks. Accordingly, impairment patterns have been clearly shown among psychomotor capabilities (especially fine motor skills in cold environments), but results for higher-order cognitive abilities are inconsistent.

Although the cause of such decreases is still unknown, various factors are probably responsible. heat stress may cause a breakdown in heat regulation in terms of biological or neurological functioning. However, the pain brought on by thermal extremes may produce an information processing diversion that hinders task-related performance (i.e., diverting resources and attention from the task and focusing on the subjective experience).

Similar modifications in strategy may be made voluntarily. It has been hypothesized, for instance, that the strategic distribution of resources among various job components may alter. When this happens, the goal change may also be toward emotion-focused coping as a result of managing both the objective unpleasantness of the stressor and the work demands at the same time.

Thermal stressors have been demonstrated to reduce performance in many different contexts,

including attentive processes (Callaway & Dembo, 1958; Pepler, 1958; Vasmatzidis, Schlegel, & Hancock, 2002), memory (Giesbecht, Arnett, Vela, & Ristow, 1993; Hocking, Silberstein, Lau, Stough, & Roberts, 2001), either psychomotor or perceptual-motor exercises (Baddeley & Fleming, 1967; Enander, 1989; Gaydoe & Dusek, 1958; Hyde, Thomas, Schrot, & Taylor, 1997; Idzikowski &

Baddeley, 1983), problem solving (Fine, Cohen, & Crist, 1960), and under various training environments (Keinan, Friedland, & Sarig-Naor, 1990).

Vigilance activities have traditionally been used to study attention processing. According to Pepler's 1958 research, attentiveness gradually dropped when the heart was under stress. Similar reductions in alertness, visual tracking, and auditory discrimination tasks were seen by Vasmatzidis, Schlegel, and Hancock (2002) when participants were exposed to heat. Cold was examined by Callaway and Dembo (1958), who found that it had an impact on how people judged sizes. A foot-deep bucket of cold water was used to simulate stressful situations involving thermal discomfort for the subjects.

The researchers discovered that the individuals had a propensity to size the things larger than matched controls. The authors concluded that the subject had not paid attention to these cues, focusing instead on the central object, since size judgments typically require the incorporation of peripheral cues like foreground elements (shadow, texture, relative position of other objects, etc.). These judgments did not appear to be related to ophthalmic changes, and Callaway and Dembo (195(surmised that some physiological mechanism seemed to increase the selectively of an individual.

Working memory performance has also been studied using thermal stimuli. Both heart and may have been examined (Hocking, Silberstein, Lau, Stough, & Roberts, 2001; Giebrecht, Arnett, Vela, & Bristow, 1993) as part of these examinations. Following immersion in cold water, Giesbrecht, Arnett, Vela, and Bristow (1993) discovered that tasks requiring little cognitive effort (auditory attention,

Benton visual recognition, and digit span forward) remained unaffected; however, these tasks deemed to be more difficult (digit span backward, requiring working memory, and the Stroop task), showed significantly worse performance.

Slaven and Windle's 1999 study simulated the conditions of a disabled submarine and found that when exposed to cold, there were no significant declines in performance, including measures of working memory. However, self-reported data indicated that participants perceived a decrease in performance. The authors suggested that motivation and the presence of peers (shipmates) might have helped mitigate the impact of cold stress.

In 1960, Fine, Cohen, and Crist conducted a study on problem-solving abilities under thermal stressors. They found no difference in performance between temperatures of 70- and 95-degrees Fahrenheit on anagram tasks. Similarly, Giovani and Rim in 1962 did not observe performance decrements in subjects responding to a dominoes task across a range of temperatures.

Grether's 1973 research focused on finger tapping, response time, and vigilance behavior. He discovered that temperature had a beneficial effect on performance until it reached a certain point, beyond which performance declined. His results indicated that performance decrements reliably occurred when temperatures exceeded 85 degrees. Hancock and Vasmatzidis in 1998 also supported a version of the Yerkes-Dodson inverted U-shaped performance curve in their review of studies on heat and performance.

The examination of perceptual-motor tasks is an extensive area where thermal stressors have been studied. Early investigations by Baddeley and colleagues grouped cold stress with other anxieties in their assessment of underwater diving performance. Enander in 1989 studied the effects of both heat and cold on manual dexterity and strength. He recognized that while there were direct physiological effects, performance on complex cognitive tasks is influenced by a combination of physiological

reactions, physical and mental capabilities, and subjective assessments.

Enander's review of cold stress research reported that reductions in core body and muscle temperature led to decreased strength and endurance, as well as reduced tactile sensitivity and manual dexterity at specific temperature thresholds. Complex motor movements and manipulation of small objects were impaired in cold temperatures. Cognitive distraction was implicated in these effects at both cool and cold water temperatures.

Exposure to cold air increased errors in serial choice-reaction time tasks of varying complexities, affecting working memory and encoding processes, likely mediated through attention. Long-term memory, however, remained fairly resistant to such effects.

Enander's review of the effects of heat suggested that while there was little initial impact on physical strength, prolonged exposure led to fatigue and decreased endurance. Vigilance and sustained attention tasks were commonly affected by heat exposure, with the pattern of effects depending on the constancy of temperature.

Driskell and colleagues' 1992 meta-analysis indicated that heat did not significantly affect the speed of performance but slightly degraded accuracy, whereas cold temperature significantly impacted both speed and accuracy. Group size played a role, with larger groups showing less negative effects of cold on performance.

Ramsay in 1983 highlighted the loss of manual dexterity in cold temperatures as a significant effect. Research by Gaydos and Dusek in 1958 found impairments in manual dexterity when hand skin temperature dropped below 53 degrees Fahrenheit. However, general mental and cognitive performance remained unaffected.

Hyde and colleagues in 1997 studied the performance of naval special operations forces under real-

world stressors, primarily in perceptual-motor domains. Exposure to cold during winter-warfare training reduced fine motor skills and hand strength but had a lesser impact on large muscle group performance. Fine motor skills were more vulnerable to disruption than gross motor skills.

Several researchers explored the role of motivation and effort in mitigating thermal stress effects. Slaven and Windle's study in 1999 suggested that motivation might counteract thermal stress effects. Razmjou and Kjellberg in 1992 found that heat increased errors but not reaction time, and this might be offset by increased effort. Razmjou in 1996 proposed that feedback and effort could moderate the negative effects of thermal stress. Together, these findings suggest that appraisal, goal-setting, and effort can moderate thermal stress effects to some extent.

2.3.1.13 Effects of Noise on Job Performance

In general, exposure to noise tends to have a negative impact on performance, although the results from various studies are somewhat mixed. Most studies suggest that intermittent noise is more disruptive to performance than continuous noise. However, it's challenging to draw definitive conclusions about the specific decibel level at which performance decrements become evident.

Some earlier studies, like those by Broadbent and colleagues in the 1950s and 1960s, found that cognitive impairments were observed after exposure to noise levels between 90 and 100 decibels (dB). On the other hand, Weinstein's study in 1974 recorded cognitive impairments at lower noise levels, as low as 68 dB.

A meta-analysis conducted by Driskell and colleagues in 1992 examined the effects of noise on performance. Their findings suggested that noise tends to have a negative effect on the accuracy of performance but generally does not significantly impact the speed of performance. The magnitude of this negative effect on accuracy was reported to be mild to moderate. Additionally, they found that noise had a strong negative effect on individuals' perceived stress levels when exposed to it.

The impact of noise on performance is influenced by several factors, including the intensity of the noise, whether it is continuous or intermittent, the duration of exposure, the delivery mode of the noise, and the type of task being assessed. For instance, although it's a common belief, Driskell and colleagues found no significant difference in the effect of continuous and intermittent noise on distress, accuracy, or speed. However, there was a trend suggesting that under continuous-noise conditions, individuals tended to perform more slowly, whereas the opposite was the case under conditions of intermittent noise.

Interestingly, individuals tend to habituate to continuous noise over time, resulting in gradually improved performance. This habituation effect does not seem to occur under intermittent noise conditions. Despite habituation, individuals tend to report greater self-reported distress as noise decibel levels increase. Additionally, the accuracy of performance is somewhat degraded with increased noise intensity, but performance speed appears to be unrelated to decibel level.

The duration of noise exposure does not consistently relate to the performance decrement observed. Performance speed is affected when individuals are exposed to intermittent bursts of noise over time, but continuous noise does not have the same effect. Individuals also tend to report experiencing less stress as noise endures, even though their performance does not improve. This suggests that as noise duration increases, individuals habituate to the noise, which may result in blocking some environmental inputs and filtering out task-relevant information, leading to performance degradation.

Driskell and colleagues'

meta-analysis found small to moderate negative effects of noise on performance accuracy across various cognitive, psychomotor, and working memory tasks. However, small to moderate positive effects were observed on tasks related to pattern recognition. The impact of noise on the speed of performance in these tasks was generally negligible.

Based on their analysis, Driskell and colleagues provided a graded effect rating based on the intensity of noise. They found that mild distress tends not to occur until noise levels exceed 80 dB, while moderate distress tends to be reported when noise levels exceed 85 dB It's not until noise levels surpass 91 dB that individuals tend to report a large negative effect. In terms of objective performance, noise levels as low as 76 dB appear to be related to decreases in accuracy. However, to observe moderate-sized effects across most performance domains, noise intensity must reach around 145 dB.

2.3.1.14 Effect of Fatigue on Job Performance

The research on fatigue and its effects on performance generally indicates that fatigue tends to degrade performance, and this negative impact becomes more pronounced as sleep deprivation accumulates. However, it's not entirely clear whether these effects are primarily due to the stress associated with fatigue or the direct consequences of fatigue itself. In the stress and performance literature, fatigue is often considered a stressor, but few studies have definitively separated the direct effects of fatigue from its indirect effects.

Defining and studying fatigue has been a challenge for researchers, with various operational definitions and little consensus on how to characterize it. Different researchers have defined fatigue in diverse ways. For example, it has been described as a subjective feeling of disinclination to continue a task, a diminished capacity for work, and potential decrements in attention, perception, decision-making, and skill performance. Essentially, fatigue can refer to feeling tired, sleepy, or exhausted.

Job and Dalziel (2001) proposed a comprehensive definition of fatigue as a state in which prior physical or mental activity, without sufficient rest, results in insufficient cellular capacity or system-

wide energy to maintain the original level of activity or processing using normal resources.

Some researchers, like Gawron, French, and Funke (2001), have categorized fatigue into two types: physical fatigue (related to a reduction in physical work capacity due to prior physical effort) and mental fatigue (inferred from performance decrements in tasks requiring alertness and information manipulation from memory).

Another classification, by Diamond and Hancock (2001), identifies passive fatigue (resulting from passive monitoring of a system without active interaction) and active fatigue (resulting from continuous or prolonged interaction with a system). Desmond and Hancock defined fatigue as a transitional state between alertness and somnolence.

Matthews and Desmond (2002) highlighted three competing hypotheses regarding the effects of fatigue on performance. The first hypothesis suggests that fatigue directly or indirectly depletes cognitive resources, leading to performance decrements. This is especially relevant for complex tasks that demand more resources.

The second hypothesis proposes that fatigue is related to the regulation of effort. Fatigued individuals tend to generate less effort than those who are not fatigued, reflecting an under-arousal state that fails to mobilize the resources required for strong performance.

The third hypothesis suggests a combination of the first two, where fatigue involves both resource depletion and effort regulation.

The measurement of fatigue has also been challenging, similar to the difficulties encountered when trying to define stress. Researchers have found it challenging to create reliable measures of fatigue without a clear understanding of what they are trying to measure.

Driskell and colleagues (1992) observed that when tasks are self-paced, there is less negative impact

on the speed of performance under fatigue, but this is not the case for work-paced tasks. They also found that in terms of self-reported distress and performance accuracy, larger groups tended to perform better, supporting the idea that "misery loves company" in subjective ratings.

Furthermore, based on established circadian patterns of performance, their research suggested that fatigue has its greatest negative impact when circadian rhythm is at its lowest (2-8 AM) and is least disruptive when the rhythm is at its highest (6-10 PM).

In summary, fatigue tends to have a detrimental effect on performance, and the exact mechanisms underlying these effects remain a subject of ongoing research and debate. The definition and measurement of fatigue pose challenges, and researchers continue to explore its various facets and its impact on different types of tasks and performance domains.

2.4 ROLE OF MANAGERS AND STRESS CONTROL

2.4.1 Task-and relationship-focused behavior

Research conducted by Selzer and Number (1988) as well as Sherdan and Vredenburgh (1978) has provided valuable insights into the impact of supervisory behaviors on employee well-being. These studies suggest that relationship-focused supervisory behaviors tend to have a positive effect on employee well-being. In other words, when supervisors prioritize building positive relationships with their employees, it can lead to improved employee well-being.

However, the impact of leaders' initiating structure (task-focused supervisory behavior) on employee well-being appears to be more nuanced. High levels of task-focused supervisory behavior can potentially have a detrimental impact on employee well-being. This suggests that when supervisors are overly focused on task-related aspects, it may lead to negative consequences for employees'

overall well-being, such as increased stress or reduced job satisfaction.

Importantly, the research also indicates that this negative impact of task-focused behavior may be mitigated or reduced if the same supervisors also engage in a range of more relationship-focused behaviors. In other words, when supervisors strike a balance between task-oriented and relationship-oriented approaches, it can help offset the potentially harmful effects of excessive task-focused behavior and contribute to a more positive employee well-being.

This highlights the importance of leadership styles that encompass both task-oriented and relationship-oriented behaviors for creating a healthier and more supportive work environment, ultimately benefiting the well-being of employees.

2.4.2 Impact of superior behavior on employees' physical health

Additionally, there is data that suggests supervisor behavior may affect crucial psycho physiological results. For instance, Wager, Feldman, and Hussy (2003) discovered that employees who worked under two supervisors with different perceptions in the same setting on separate working days (where one supervisor was perceived as having a significantly more favorable supervisory interaction style than the other) displayed significantly higher systolic and diastolic blood pressure on those days.

Additionally, this study is in line with earlier studies that found associations between problematic aspects of the workplace and a higher risk of cardiovascular illness (e.g., Bosma et al., 1998; Theorell & Karasek, 1996).

Interesting results from this study also showed that working for a supervisor who was well-liked was connected with lower blood pressure readings than those seen at home on days off, suggesting that some supervisors may support their physical well-being.

2.4.3 Behaviours underpinning Supervisory Support

One of the factors most commonly studied in the literature on occupational stress is social support. Despite the fact that most studies in this field show that support from a variety of sources, such as peers and supervisors, can help to lessen employee stress (e.g., Cohen & Eills, 1985; Dorman & Zapf, 1999; Fenalson & Beehr, 1994; Ganster, Fusillier, & Mayes, 1986; LaRocco & Jones, 1978), these studies have typically used fairly all-encompassing metrics.

However, two studies that focused on more particular actions or behaviors that make up supervisory assistance were examined. The frequency of three different types of potentially supervisory communication (positive, negative, and non-job) were examined by Fenalson and Beehr in 1994. Positive job-related supervisory communication was found to be the most helpful in reducing employee strain, followed by no-job related communication, according to the more traditional global measures of supervisory communication (positive, negative, and non-job), supervisory support, and employee strain.

It's interesting to note that higher levels of negative job-related communication were linked to higher levels of employee stress (implying that regularly discussing problematic aspects of the job does not constitute an active component of supervisory support); additionally, the specific contents of supervisory communications explained more variation in employee stress than the conventional overall measures of supervisory support. According to Stephens and Long's (2000) research, less psychological stress was associated with more frequent non-work and constructive job-related supervisory communication.

2.4.4 Impact of Bullying Supervisory Behaviours

Perhaps not unexpectedly, the idea of workplace bullying has attracted a considerable bit of attention in the literature on occupational stress (e.g., Hotel et al., 1999; Kivimaki et al, 2003; Quine, 1999; Rayner & Hoel, 1997) While bullies may occasionally be other employees who are targeted for bullying, this is less common (e.g., Einarsen, 2000; O'connell & Korabik, 2000; Quine, 1999). Bullies are more frequently perpetrated by managers or supervisors of the target.

Beswick, Gore, and Palferman (2006) conducted a thorough review of the bullying literature on behalf of the HSE and found that numerous studies have discovered significant correlations between bullying experiences and physical and psychological stressors, such as chronic fatigue, sleep problems, and stomach issues, as well as absences due to illness. Additionally, they note that role conflict, poor work control, an authoritarian management style, and a change in supervisor may all be organizational precursors to bullying. The bullying behavior model must take into account good management behaviors, not just the negative behavioral indicators by Beswick et al. (2006), according to a review by Rayner and Mclvor (2006).

2.4.5 Transformational and transactional leader behavior

Since Yarker et al. (2007) published their review, the bulk of publications have examined the relationship between well-being and the behaviors of transformational, transactional, or laissez-faire leaders. Employee turnover was compared to perceived leading style by Hetland, Scandal, and Johnsen (2007). According to the findings, having a supervisor who exemplifies transformational leadership is associated with employees' lower levels of cynicism and higher levels of professional efficacy.

Additionally, passive avoidant leadership philosophies were discovered to be associated with improved employee professional efficacy. The authors concluded that negative leadership behaviors

are more significant for burnout than perception of positive leadership styles since transactional leadership was not associated with any of the components of burnout.

Moods and emotions among employees were studied by Bono, Foldes, Vinson, and Muros in 2007. Employees with transformational leaders reported feeling more upbeat, content, and enthusiastic throughout the day than those with non-transformational leaders. According to findings from two research, transformative leadership and well-being are mediated by the meaning people attribute to their job, according to Arnold, Turner, Barling, Kelloway, and McKee's 2007 paper.

According to this, having a manager who demonstrates transformational leadership behaviors may boost employees' perceptions of the significance of their work, which in turn has a favorable effect on their psychological well-being. This study expands the list of benefits to mental health that have been linked to transformational leadership and makes a significant advancement in the study of probable processes or mediators through which leadership style affects employee wellbeing.

Lenient leadership and supervisory bullying behaviors are related in two studies. According to a study by Skogstad, Einarsen, Torsheim, Aasland & Hetland (2007), laissez-faire leadership was associated with an increase in employee conflicts as well as role conflict and ambiguity. Further, path modeling revealed a direct link between employees' experiences of bullying and laissez-faire leadership.

In a related study, Hauge, Skogstad, and Einarsen (2007) discovered a connection between laissez-faire leadership and bullying and that bullying was more likely to happen when direct supervisors refrained from interceding and handling the tense situation.

2.4.6 Other Supervisory Behaviours

In a long-term study, Delve, Skapert, and Vilhelmsson (2007) looked at the connections between long-team work attendance, leadership methods, and workplace health promotion (WHP). The usage of rewards, recognition, and respect by leaders was linked to increased staff attendance.

Intriguingly, better work attendance was also observed in units where the leaders believed that the high rate of sick leave was caused by the organization rather than by specific individuals. The effects of aggressive supervisor behavior on employee outcomes were studied by Schaubroeck, Walumbra, Ganster, and Kepes in 2007. In this situation, blaming others, giving bad feedback, a propensity for arguments, and a low threshold for annoyance were the traits of a hostile leader (Tepper, 2000).
This study discovered a link between employee well-being (including anxiety, despair, and somatic symptoms) and supervisor antagonism. The influence of supervisor hostility on well-being was found to be tempered by job enrichment, which is defined as job scope. If the employee has an enriched job, the impact of supervisor hostility on well-being is lowered.

2.5 STRESS MANAGEMENT AT THE WORKPLACE

Programs for managing stress have been found to be beneficial in reducing symptoms related to stress by a number of studies (Bernier & Gaston, 1989; Saunders, Driskell, Johnston, & Salas, 1996; Zakowski, Hall, & Baum, 1992). Over a three-year period, including nine and 16-month follow-ups, Kagan and Watson (1995) designed a psychoeducational stress management program for emergency medical service professionals. This rather thorough investigation showed that the program had a positive impact on a number of variables, including behavioral outcomes like the increase in customer compliment letters and measures of emotional health like depression, anxiety, strain, depersonalization, and a sense of accomplishment.

Murphy (1996) also looked into the effectiveness of stress-reduction courses. After conducting a 20-year examination of several programs, he concluded that the most successful stress management strategies integrated multiple modalities. Humara (2002) also reviewed these programs (for sports performance) and discovered a number of shared mechanisms among the systems examined. According to the findings of his review, programs that emphasize goal-setting, optimistic thinking, scenario restructuring, relaxation, focused attention, and imagery and mental rehearsal are often the most successful in enhancing performance and lowering anxiety.

Various researchers have explored different elements within stress reduction programs. For instance, Dandoy and Goldstein (1990) discovered that using intellectualization techniques had a positive impact on coping with stress. They found that exposing individuals to statements encouraging emotional detachment and analytical observation of industrial accidents, like a table saw injury on video, led to reduced physiological arousal and improved memory recall.

Shipley and Baranski (2002) studied the effects of a visualization strategy called visuo-motor behavior rehearsal in stressful police scenarios. This technique involves vividly imagining a flawless performance before actually doing it. It is believed that such visualization can trigger muscle contractions similar to those during the actual performance. Others suggest that visualization offers a relaxed environment for practicing and problem-solving, reducing anxiety and stress associated with real performance. In Shipley and Baranski's study, officers using visualization reported lower anxiety and better performance in subsequent tests.

Caldwell (1997) found that pilots improved their restfulness and sleep patterns with self-administered relaxation therapy. They also showed that incorporating certain medications, such as central nervous system stimulants, into stress management procedures could enhance performance, mood, and

alertness.

Dutke and Stober (2001) observed that improving individual motivation mitigated the adverse effects of stress on performance. Katz and Epstein (1991) found that individuals with constructive thinking tendencies were less physiologically aroused and more positive emotionally and cognitively when facing stress.

Ingledew, Hardy, and Cooper (1997) noted that as psychological stress increased, so did avoidance coping strategies, but individuals with high internal strategies and perceived social support were less likely to use avoidance coping. Strategies focusing on emotions and problem-solving had the most positive effect.

Collectively, these studies suggest that stress management and coping programs often target cognitive appraisal mechanisms. However, it's important to note that experienced pilots showed different physiological responses compared to student pilots, suggesting that experience plays a role in how individuals handle stress. Additionally, physiological measures like blood pressure have been linked to attention and reaction time, and the anterior cingulate in the frontal lobe may play a role in arousal-dependent processes.

Matthews (2001) highlighted the contributions of neuroscience in understanding how mental resources and information processing are influenced by biological factors such as drugs, hormones, and neurotransmitters. However, he also noted limitations in identifying specific neural systems involved in responding to biological stressors, understanding real-world experiences and their neural responses, creating biological models of personality and individual differences, and addressing unanswered questions about cognition and processing.

2.6 STRESS AND HEALTH

2.6.1 Effects of Occupational Stress and the Immune System

The human body possesses a remarkable defense mechanism against illness, primarily through the function of the immune system. While we often rely on highly trained medical specialists to combat diseases, our immune system constantly works to protect us from various threats (Jiang & Chess, 2006).

At any given moment, millions of white blood cells, known as leukocytes, serve as the immune system's front-line soldiers in the battle against invading microbes. These leukocytes have various strategies to combat pathogens such as bacteria, viruses, fungi, as well as remove damaged or cancerous cells. Leukocytes recognize these invaders through surface fragments called antigens, which are essentially the triggers for the immune response. Some leukocytes produce antibodies, specialized proteins that lock onto antigens, effectively tagging them for destruction by specialized "killer" lymphocytes, which act like commandos on a mission (Greenwood, 2006; Kay, 2006).

Additionally, there are "memory lymphocytes," a type of leukocyte, which are kept in reserve. Instead of immediately attacking foreign bodies, these memory lymphocytes remain in the bloodstream for an extended period, forming the foundation for a rapid immune response upon encountering the same invader again.

However, chronic or repetitive stress can have a detrimental impact on the immune system (Epstein, 2003; Kemeny, 2003). Prolonged exposure to stress weakens the immune system, making individuals more susceptible to illnesses like the common cold, flu, and potentially chronic diseases like cancer. Psychological stressors can hinder the immune system's response, particularly when stress is intense or persistent (Segerstrom & Miller, 2004).

Even shorter periods of stress, such as during final exams, can weaken the immune system, although the effects are generally less severe than those associated with chronic stress. Life stressors such as marital conflicts, divorce, and chronic unemployment can also take a toll on the immune system, making individuals more vulnerable to diseases (e.g., Kiecolt-Glaser et al., 2002). Traumatic stress, which can be likened to an internal war, has the potential to significantly impact the immune system's functioning. White blood cells, depicted as purple cells in images, play a vital role in the body's defense against bacteria, viruses, and other invading organisms.

2.6.2 Effects Work Stress on Cardiovascular Disease

The cardiovascular system, which includes the heart and blood vessels, is crucial for sustaining life. However, it faces challenges in the form of cardiovascular diseases (CVD), also known as heart and artery diseases. CVD is the leading cause of death in the United States, responsible for approximately one million deaths annually, accounting for about 40% of all deaths, with heart attacks and strokes being the most common outcomes (Hu & Willett, 2002; Nabel, 2003). Among the various forms of CVD, coronary heart disease (CHD) is the primary contributor, leading to approximately 700,000 deaths annually, predominantly due to heart attacks. Notably, CVD affects both men and women, with more women losing their lives to CVD than to breast cancer.

In CHD, there is inadequate blood flow to the heart, leading to its insufficient oxygen supply. The fundamental process underlying CHD is arteriosclerosis, commonly known as "hardening of the arteries." In this condition, the walls of arteries become thicker, harder, and less flexible, making it challenging for blood to flow freely. Atherosclerosis, a related process, involves the accumulation of

fatty deposits along artery walls, forming artery-clogging plaque. If a blood clot forms in an artery narrowed by plaque, it can partially or completely block blood flow to the heart, resulting in a heart attack (also called a myocardial infarction) as heart tissue is deprived of oxygen-rich blood. Similarly, when a blood clot obstructs an artery serving the brain, it can lead to a stroke, causing brain tissue death, loss of function controlled by that part of the brain, coma, or even death.

The positive news is that CHD is largely preventable (Nabel, 2003). This prevention primarily involves reducing controllable risk factors. Some risk factors, such as age and family history, cannot be controlled, but others can be managed through medical treatment or lifestyle changes. These modifiable risk factors include high blood cholesterol, hypertension (high blood pressure), smoking, overeating, excessive alcohol consumption, a high-fat diet, and leading a sedentary lifestyle (e.g., Mendelsohn & Karas, 2005; Panagiotakos et al., 2005; Pickering, 2003). Unfortunately, many individuals still have uncontrolled risk factors. For example, only a quarter of adults with high blood pressure take medication to manage it (Chobanian, 2001; Hyman & Pavlik, 2001). Adopting healthier behaviors, such as regular physical activity, can reduce the risk of cardiovascular disease, even for individuals who have been sedentary (Blumenthal et al., 2005; Borjesson & Dahlof, 2005).

Additionally, emotional distress, including anger, anxiety, and depression, can have detrimental effects on the cardiovascular system (Frasure-Smith & Lespérance, 2005; Geipert, 2007; Orth-Gomér et al., 2000). Chronic anger, in particular, has been linked to an increased risk of CHD (Kiecolt-Glaser et al., 2002; Pressman & Cohen, 2005; Rutledge & Hogan, 2002; Steptoe, Wardle, & Marmot, 2005). Anger often accompanies hostility, a personality trait characterized by quickness to anger, blame toward others, and a negative worldview. Hostility is a component of the Type A behavior

pattern (TABP), a behavior style found in individuals who are highly competitive, impatient, ambitious, and driven. While earlier research suggested a link between the Type A pattern and CHD risk, recent studies have cast doubt on this relationship, focusing more on the consistent connection between hostility and heart disease, as hostile individuals are prone to easily becoming angry (Geipert, 2007; Mathews, 2005; Olson et al., 2006).

The mechanism through which anger and other negative emotions contribute to heart disease is not fully understood, but researchers suspect that stress hormones like epinephrine and norepinephrine play significant roles (Januzzi & DeSanctis, 1999; Melani, 2001). Anxiety and anger trigger the release of these stress hormones by the adrenal glands. These hormones increase heart rate, breathing rate, and blood pressure, which prepares the body for a "fight or flight" response in the face of a threat. In individuals who frequently experience strong negative emotions like anger or anxiety, the body may repeatedly release these stress hormones, eventually causing damage to the heart and blood vessels.

Moreover, evidence suggests that acute episodes of anger can trigger heart attacks and sudden cardiac death in people with established heart disease (Clay, 2001a). Individuals with higher levels of hostility tend to have more cardiovascular risk factors, including obesity and smoking, compared to less hostile individuals (Bunde & Suls, 2006). Anxiety and anger may also contribute to heart disease by raising blood cholesterol levels, increasing the risk of artery-clogging plaque formation (Suinn, 2001).

2.6.3 Effects of Work Stress on Headaches

Headaches are common symptoms associated with various medical conditions. However, when they

occur independently of other symptoms, they are often classified as stress-related. The most prevalent type of headache is the tension headache, which is frequently linked to stress. Stress can lead to persistent muscle contractions in the scalp, face, neck, and shoulders, resulting in periodic or chronic tension headaches. These headaches typically develop gradually and are characterized by a dull, continuous pain on both sides of the head, often accompanied by feelings of pressure or tightness. Most other types of headaches, including severe migraines, seem to involve changes in blood flow to the brain (Durham, 2004; Linde et al., 2005).

Migraine headaches, which affect over 28 million Americans, are a distinct and often debilitating type of headache. They can last for hours or even days and may occur frequently or infrequently, ranging from daily occurrences to once every other month. Migraines are typically characterized by intense, piercing, or throbbing pain that is usually localized to one side of the head or centered behind an eye. The pain can be so severe that it feels intolerable. Migraine sufferers may also experience an "aura" before the onset of the headache, which consists of warning sensations like flashing lights, unusual images, or blind spots. Coping with the agony of severe migraine attacks can significantly impact a person's quality of life, leading to disturbances in sleep, mood, and cognitive processes.

The exact underlying causes of headaches remain unclear and are subjects of ongoing research. One factor contributing to tension headaches may be an increased sensitivity of the neural pathways that transmit pain signals from the face and head to the brain (Holroyd, 2002). Migraine headaches may involve an underlying central nervous system disorder that affects the nerves and blood vessels in the brain. The neurotransmitter serotonin is also thought to play a role in migraines. Decreased levels of serotonin may cause blood vessels in the brain to first constrict (narrow) and then dilate (expand), leading to the throbbing and piercing pain associated with migraines. These physiological processes are closely connected to psychosomatic factors, in which psychological factors play a causal or

contributory role in the physical disorder.

2.6.4 Effects of Work Stress on Cancer

The term "cancer" is arguably one of the most dreaded words in the English language, and for good reason. In the United States, cancer is responsible for one out of every four deaths. Annually, cancer claims the lives of approximately half a million Americans, translating to roughly one life lost every 90 seconds. The statistics are sobering: Men have a one in two chance of developing cancer at some point in their lives, while for women, the odds are one in three. However, there is a glimmer of hope: The death rate from cancer has been gradually declining in recent years, primarily due to advancements in screening and treatment (Jemal et al., 2007).

Cancer is characterized by the growth of abnormal or mutated cells that form tumors, which can infiltrate healthy tissue. Cancerous cells can appear anywhere in the body, including the blood, bones, lungs, digestive tract, and reproductive organs. When not detected and treated early, cancer can metastasize, spreading to different parts of the body, often leading to fatal outcomes. The causes of cancer are multifaceted, encompassing genetic factors, exposure to carcinogenic chemicals, and even contact with certain viruses (Godtfredsen, Prescott, & Osler, 2005; Samuels et al., 2004; Walsh et al., 2006). Unhealthy behaviors, such as high-fat diets, excessive alcohol consumption, smoking, and prolonged exposure to ultraviolet light (causing skin cancer), also contribute to cancer development.

Conversely, a daily intake of fruits and vegetables may reduce the risk of certain types of cancer. Notably, Japan has lower cancer death rates compared to the United States, and this difference cannot be attributed to genetics or race. Japanese Americans who consume a diet similar to that of their American counterparts exhibit similar cancer death rates.

A compromised or weakened immune system may increase susceptibility to cancer, and we've

observed that psychological factors, like exposure to stress, can impact the immune system. Consequently, there is a hypothesis that stress may elevate an individual's risk of developing cancer. However, the evidence linking stress to cancer is inconclusive and requires further investigation (Delahanty & Baum, 2001; Dougall & Baum, 2001). On the other hand, we have learned that psychological interventions that focus on helping cancer patients cope with the disease, such as group support programs, can enhance their psychological well-being and adjustment (Helgeson, 2005; Taylor et al., 2003). It remains to be seen whether such psychological interventions actually extend the survival of cancer patients. Training programs designed to develop coping skills, including relaxation techniques, stress management, and coping strategies, may assist cancer patients in alleviating the stress and pain associated with dealing with the disease. These coping skills may also help patients manage the adverse side effects of chemotherapy. For instance, cues associated with chemotherapy, such as the hospital environment, can become conditioned stimuli that induce nausea and vomiting even before the drugs are administered. Pairing relaxation, pleasant imagery, and attention diversion with these cues can help reduce the nausea and vomiting associated with chemotherapy (Redd & Jacobsen, 2001).

CHAPTER THREE

3.0 METHODOLOGY

INTRODUCTION

This chapter presents the methodology used to carry out the study. It discusses the research setting, population, sample and sample determination, sampling technique, research design, research instruments, procedure for data collection and data analysis. The procedure for data collection and data analysis has been discussed.

3.1 RESEARCH SETTING

Koforidua Technical University was established in 1997 as a result of a government decision to start a Koforidua Technical University in the Eastern region. It was therefore sited at the campus of the then Koforidua Technical Institute (KTI). The Polytechnic aims at providing tertiary education in the fields of manufacturing, commerce, science and technology, applied social sciences and arts.

Additionally, it aims at providing opportunities for development, research and publication of research findings. The mission of the Polytechnic is to provide career- focused education and training at the tertiary level with emphasis on hands-on experience and entrepreneurship development to produce middle-level management personnel through:

- The promotion of partnership with industry and other institutions. Creation of congenial and favourable teaching and learning environment.
- Provision of opportunities for practical research.

- Provision of expert services to meet societal needs.
- Diversification of sources of funding to support institutional activities.

Currently, the Polytechnic runs both Higher National Diploma (HND) in Accountancy, Marketing, Purchasing and Supply, Computer Science and Networking Management, Hospitality Management, Applied Mathematics, Mechanical Engineering, Electrical and Electronic Engineering, Renewable Energy Systems Engineering, Automotive Engineering and Building Technology Engineering and Non-HND programmes such as Diploma in Business Studies (Accountancy, Secretarial Studies, Purchasing and Supply, Computer Science and Marketing). The polytechnic has a student population of about 5,121 and 577members of staff.

Koforidua Technical University occupies a total land space of 78.41 acres. The Koforidua Technical University shares common boundaries with Capital View Hotel and Simpoa Meansa to the East, Osabene and Akwapim North District Assembly to the North, the main Koforidua – Accra road to the West, and New Juaben Senior High and SSNIT Flats at Adweso to the South.

3.2 POPULATION

Furlong et. al (2000) described the population of a research as the study of a large group of interest for which research is relevant and applicable. The Management and staff of Koforidua Technical University constitute the target population for this research. All the departments of the Koforidua Technical University comprising of academic and non-academic staff took part in the exercise.

2.3 SAMPLE AND SAMPLE DETERMINATION

The sample population is a subset of the entire population, and inferential statistics is to generalize from the sample to the population (Furlong et. al, 2000). A sample size of 150 respondents was used for the study. The sample size was determined using Yamane‘s (1967) simplified formula corrected

to proportion to determine the sample size for the study. It is defined as;

$$n = \frac{N}{1 + N(e)^2}$$

N: - Total population

n:-Sample size

e: - Precision

$$n = \frac{577}{1 + 577(0.05)^2}$$

$$= 150$$

Table 3.1 Sample size drawn from both non-academic and academic

Type of customer	**Population**	**Sample**
Non-Academic	500	130
Academic	77	20
Total	**577**	**150**

3.4 SAMPLING TECHNIQUE

The systematic sampling method was used to select participants for the study. The systematic sampling technique is a way of selecting respondents which determines how to select members of a population that will be studied. By this method, every "nth" member is selected from the total population for inclusion in the sample population. The respondents were selected from a starting member of a group example non-academic and then the means was repeated in other groups to select the other respondents. This technique is more efficient because it improves accuracy of estimates.

3.4 PROCEDURE OF DATA COLLECTION

The register of staff members was collected was obtained from the human resource department. The first fourth name was selected and then the difference of four was used an interval to select the rest of the respondents. Copies of the questionnaire were personally handed to respondents at their offices. After some minutes the researcher went back and collected the answered questionnaires because the respondents may forget to fill in the questionnaire or misplace them entirely.

The questions were thoroughly explained to the respondents after copies of the questionnaire were handed to them. The purpose was to help the respondents understand the relevance of the research and provide their independent views on the questionnaire items given them. To have a valid and a reliable data, the researcher ensured that the questionnaires were well prepared which allowed error minimization.

The questionnaire had close-ended questions which respondents were asked to tick the appropriate answer. Some of the questions were open-ended which offered respondents the opportunity to express their views freely.

3.5 RESEARCH INSTRUMENTS

For the respondents, both open-ended and closed-ended questionnaires were created. To capture the key topics outlined in the study's objectives, the questionnaires were separated into multiple sections.

Some staff members who requested guidance were given personal questionnaire administration and explanations of the questions' contents. It was decided to send and distribute a total of 150 questionnaires to the Polytechnic's administrative and academic staff. Additionally, interviews were done to help clarify and understand some of the respondents' comments more thoroughly. 91% of the total surveys distributed were answered. Further information from respondents was gathered using structured interview guidelines. The researcher also conducted in-person observations of institutional

labor practices and procedures.

3.6 RESEARCH DESIGN

According to Cooper and Schindler (2001), a research design is a strategy that encourages the systematic management of data collecting. What is required to respond to your research questions depends on design and methods. The study uses a cross-sectional survey as its primary research approach. According to Yin (1994), a survey is a methodical way to collect data from a sample of people in order to describe the characteristics of the larger population to which those people belong.

The cross-sectional approach was chosen because it focused on the research issue at a specific moment in time rather than across a longer period of time (longitudinal). Since the research problem cannot be immediately observed, this approach is thought to be useful. As a result, it is impossible to directly examine how occupational stress affects the performance of Koforidua Technical University employees at work.

3.7 DATA ANALYSIS

Analysis is a research method for establishing verifiable links between facts and their context. The researcher looks for patterns and structures in the text and draws conclusions based on such patterns (Krippendor, K. 1990).

The data was examined using the Statistical Package for Social Sciences (SPSS). The information gathered was used to create tables and other statistical inferences. Charts, pie charts, and other representations were employed to enable quick and simple data interpretation. Additionally, responses were given as percentages. Consistency of the data from the completed questionnaire was examined.

For convenient use of the Statistical Package for Social Sciences (SPSS), the questionnaire items were coded and categorised depending on the responses provided by the respondents. This approach was chosen because it provides the finest means of identification, comparison, description, and conclusion.

The data was analysed in consonance with the set objectives of the study as indicated below:

- To examine the effects of stress on workers in the performance of their job.
- To evaluate Management competencies for controlling and reducing stress at work.
- To assess the support for those people who are suffering from stress.
- To assess how work related stress can affect the health of workers.

CHAPTER FOUR

DATA ANALYSIS AND DISCUSSION OF RESULTS

INTRODUCTION

This chapter presents an analysis of data collected. It considered the selected responses to the objectives of the study as well as the various research questions presented at the early stages of the research and also some relevant variables considered in the study.

4.1 DEMOGRAPHIC ANALYSIS

Table 4.1 Gender of Respondents

Response	Frequency	Percent
Male	79	57.7
Female	58	42.3
Total	137	100.0

Source: Field survey, 2012

The table above shows that 79 (57.7%) of the respondents were males with the remaining 58 (42.3%) being females. This result is not surprising as there are more males workers in the Koforidua Technical University than females.

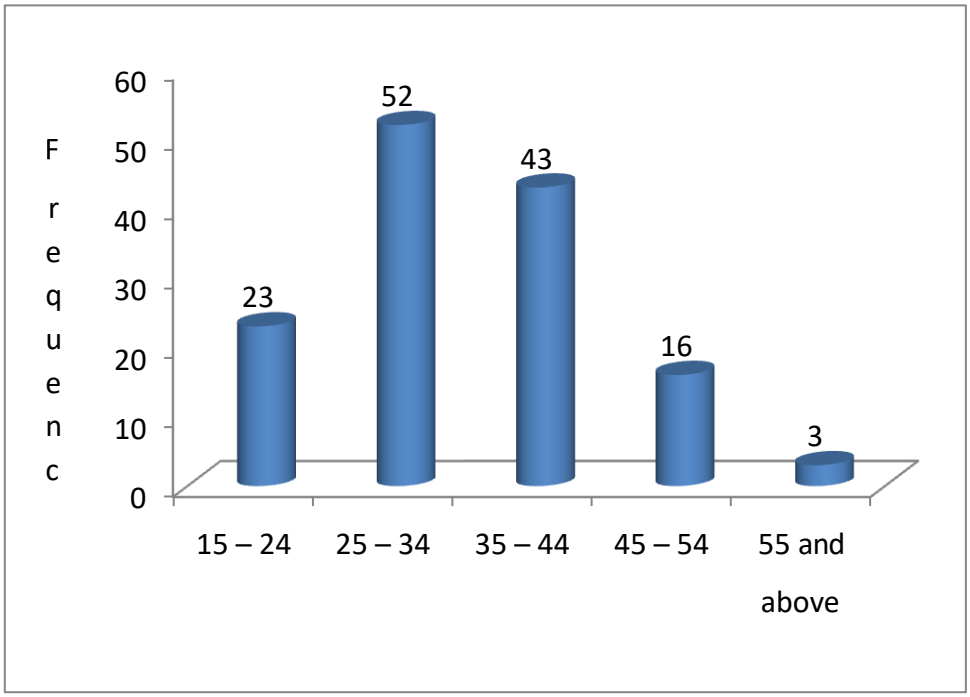

Figure 4.1 Ages of Respondents Source: Field survey, 2012

The figure above which shows the age distribution of the respondents indicates that 23 (16.8%) and 52 (38.0%) of the respondents respectively fell in the 15 – 24 and 25 – 34 age brackets. 43 (31.4%) and 16 (11.7%) respectively fell in the 35 – 44 and 45 – 54 age brackets. The remaining 3 (2.2%) fell in the 55 years and above age bracket.

From the above it can be inferred that majority of the respondents are below the age of forty – five (45) years, thus Koforidua Technical University has a youthful work force.

Table 4.2 Level of Education of Respondents

Response	Frequency	Percent
MSLC/JHS	2	1.5
O'Level/SSSCE/WASSCE	9	6.6
A' Level	3	2.2
Diploma	24	17.5
1st Degree	78	56.9
Masters Degree	21	15.3
Total	137	100.0

Source: Field survey, 2012

The table above reports that 78 (56.9%) and 21 (15.3%) of the respondents had a first degree and a masters degree as their highest level of education. 24 (17.5%) and 3 (2.2%) of them respectively had a diploma and A‘ Level. It can be said that the cleaners and the clerks are those having at most a WASSCE or O‘ Level.

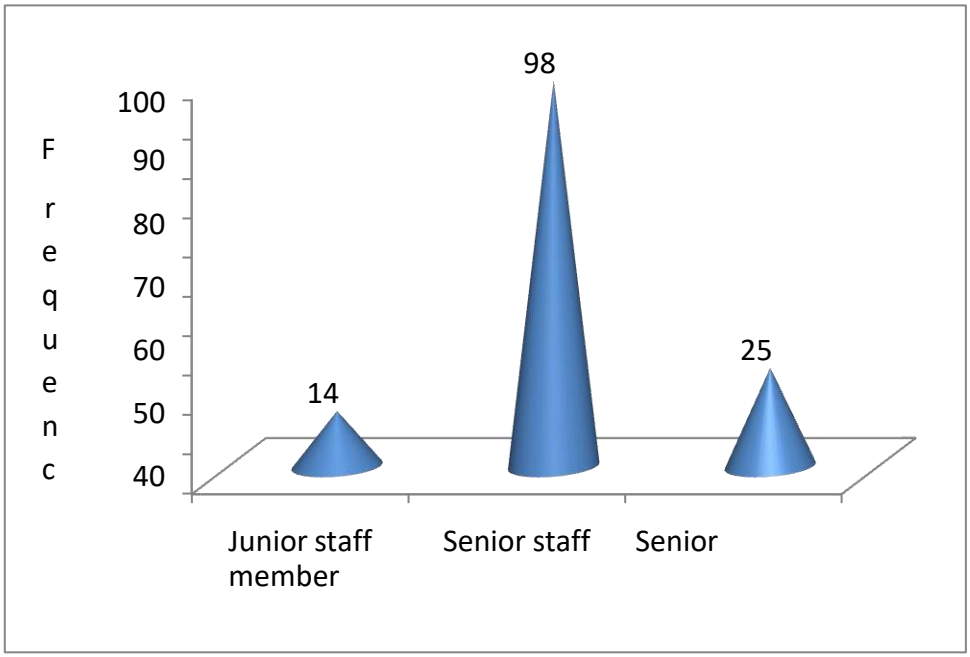

Figure 4.2 Status of respondents

Source: Field survey, 2012

The figure above shows that 14 (10.2) and 98 (71.5%) of the respondents respectively were junior staff and senior staff. The remaining 25 (18.2%) were senior members.

Table 4.3 Marital Status of Respondents

Response	Frequency	Percent
Single	65	47.4
Married	72	52.6
Total	137	100.0

Source: Field survey, 2012

The table above shows that 72 (52.6%) were married men and women while the remaining 65

(47.4%) were single.

The researcher in his bid to find out whether respondents have heard about occupational stress asked, have you heard about occupational stress? Their response is presented below.

4.2 OCCUPATIONAL STRESS AND JOB PERFORMANCE

Table 4.4 Have you heard about occupational stress?

Response	Frequency	Percent
Yes	135	98.5
No	2	1.5
Total	137	100.0

Source: Field survey, 2012

It can be seen from the table above that as many as 135(98.5%) of the respondents responded in the affirmative with the remaining 2 (1.5%) responding in the negative. It can be inferred from the above that the respondents will be the rightful people to answer the subsequent questions. Respondents were then asked the medium through which they head the occupational stress. Their response is presented below.

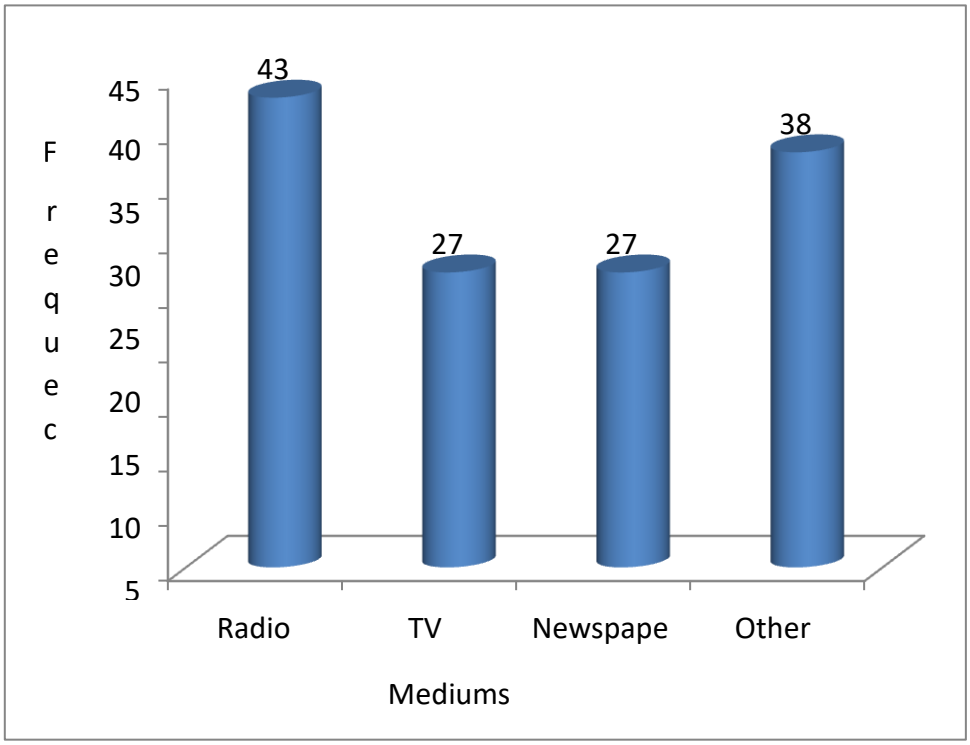

Figure 4.3 Which medium of communication did you hear it from?

Source: Field survey, 2012

The figure above shows that 43 (31.9%) and 27 (20.0%) of the respondents respectively mentioned radio and television. Another 27 (20.0%) mentioned newspapers. The remaining 38 (28.1%) mentioned that they read it from books and journals, heard about it at a seminar with some saying it is a combination of all the three above. Respondents were then asked what in their view constitute occupational stress. Their response is presented below.

Table 4.5 To you, what constitute Occupational Stress?

Response	Frequency	Percent
Workload	76	55.5
Role overload	28	20.4
Role ambiguity	29	21.2
Other	4	2.9
Total	137	100.0

Source: Field survey, 2012

Table 4.2.3 above indicates that 76 (55.5%) of the respondents mentioned workload as what constitute occupational stress. 29 (21.2%) and 28 (20.4%) of them respectively mentioned role ambiguity and role overload as what in their view constitute occupational stress. The remaining 4 (2.9%) mentioned bad superior and subordinate practices. From the above, it can be concluded that the major constituent of occupational stress is workload.

Table 4.6 What do you think are the signals of occupational stress?

Response	Frequency	Percent
Feeling anxious, irritable or depressed	68	26.7%
Apathy, Loss of interest in work	65	25.5%
Problems sleeping, fatigue	50	19.6%
Troubles concentrating	70	27.5%
Others	2	.8%
Total	255	100.0%

Source: Field survey, 2012

The table above shows that out of a total of 255 responses, 70 (27.5%) and 68 (26.7%) respectively went in favour of troubles concentrating and feeling anxious, irritable or depressed as the signals of occupational stress. 65 (25.5%) and 50 (19.6%) responses went in favour of apathy, loss of interest in work and problems sleeping, fatigue as signals of occupational stress.

Table 4.7 Have you ever experienced any of the signs of occupational stress?

Response	Frequency	Percent
Yes	115	83.9
No	14	10.2
Don't know	8	5.8
Total	137	100.0

Source: Field survey, 2012

The table above shows that as many as 115 (83.9%) responded in the affirmative when they were asked whether they had ever experienced any sign of occupational stress. 14 (10.2%) of them responded in the negative with the remaining 8 (5.8%) claiming they do not know. Respondents were then asked whether occupational stress can have any effect on ones performance at work.

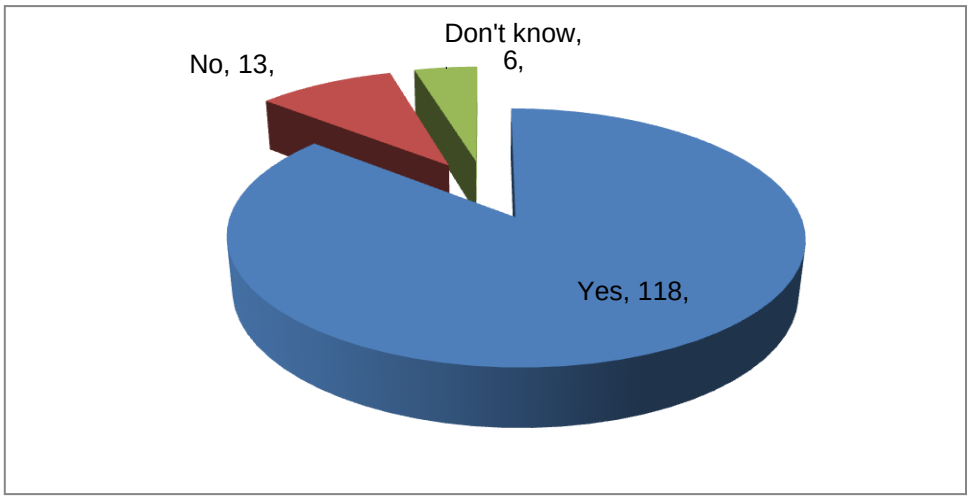

Figure 4.4 Does occupational stress has any effect on your performance? Source: Field survey, 2012

The figure above reports once again that as many as 118 (86.1%) of the respondents were positive in

their response that occupational stress can have an effect on ones performance. 13 (9.5%) responded in the negative with the remaining 6 (4.4%) claiming they have no idea. The table below shows the effects that respondents said stress has on them.

Table 4.8 What effects did it have on you?

Response	Frequency	Percent
Absenteeism	8	6.8
Reduced productivity	75	63.6
Low morale	29	24.6
Poor work relations	6	5.1
Total	118	100.0

Source: Field survey, 2012

Table 4.8 shows that 75 (63.6%) and 29 (24.6%) of the respondents respectively mentioned reduced productivity and low morale as the effect that they have experienced as a result of stress. 8 (6.8%) and 6 (5.1%) of them respectively also mentioned absenteeism and poor work relations as some effects that stress had on them.

CONTROL SCALE

Table 4.9 How much influence do you have over the availability of supplies and equipment you need to do your work?

Response	Frequency	Percent
Very much	23	16.8
Somewhat	24	17.5
A little	49	35.8
Not at all	41	29.9
Total	137	100.0

Source: Field survey, 2012

The table above shows that 23 (16.8%) and 24 (17.5%) of the respondents respectively claimed that they very much and somewhat have an influence on the availability of supplies and equipments that they need to work with. 49 (35.8%) of the respondents said they have little influence on the availability of supplies and equipments that they need to work with. The remaining 41 (29.9%) claimed they have no influence at all on the availability of supplies and equipments that they need to work with. An inference from the above is that about as about two – thirds of the respondents do not have the necessary influence over the supplies of equipment that they need to carry out their jobs judiciously. This has a effect on their work output which can easily be hamper their productivity. By extension it can be said that most workers of Koforidua Polytechnic do not have the influence over the supplies of equipments that they need to carry out their day – to – day duties.

Table 4.10 How much influence do you have over the order in which you perform tasks at work?

Response	Frequency	Percent
Very much	33	24.1
Somewhat	33	24.1
A little	46	33.6
Not at all	25	18.2
Total	137	100.0

Source: Field survey, 2012

The table above which shows the distribution on the level of influence that the respondents have over the order in which they perform their task indicates that 33 (24.1%) persons each respectively claimed they have a very much and somewhat influence. 46 (33.6%) said they have a little influence with the remaining 25 (18.2%) claiming they have no influence at all. It can be inferred from the above table that most workers of the Polytechnic cannot work in a manner that would seek to relief them of work-related stress. Thus little flexibility in the way

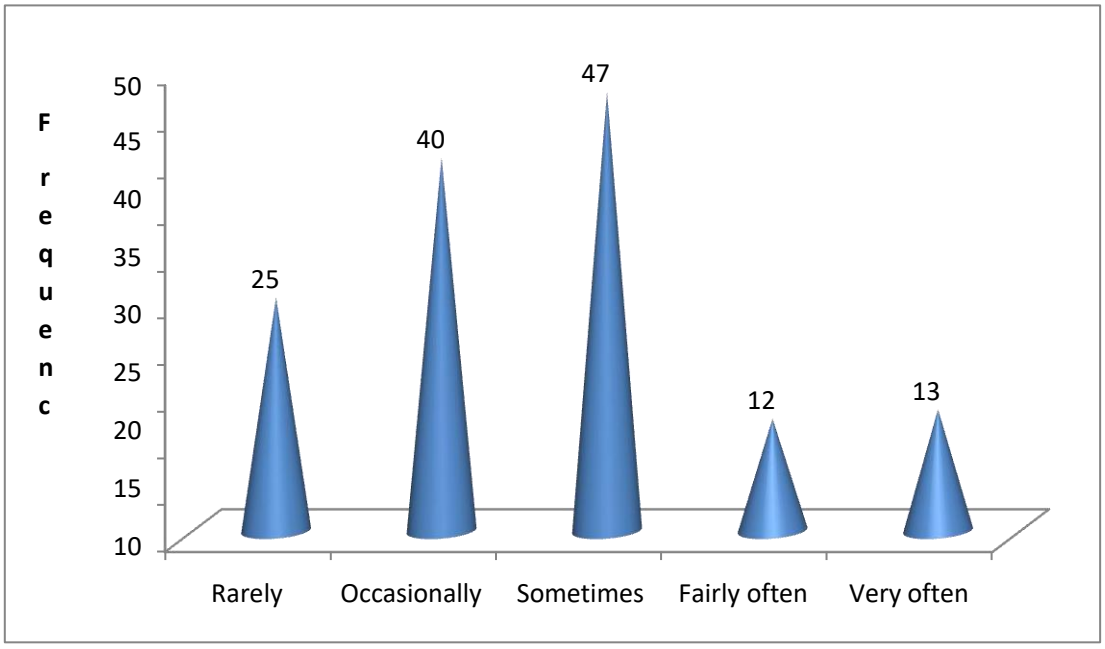

Figure 4.5: How often does your job leave you with little time to get things done? Source: Field survey, 2012

The figure above shows that 25 (18.2%) and 40 (29.2%) of the respondents respectively said the kind of job that they do rarely and occasionally leave them with little time to get things done. Again 47 (34.3%) and 13 (8.8%) of them respectively claimed the nature of their job sometimes and fairly often leave them with little time to get things done. The remaining 13 (9.5%) claimed their job very often leave them with little time to get things done. From the above it can be said that quite a large proportion of the workers of the Polytechnic do not get enough time to get things done. It therefore means that they are always busy doing one thing or the other.

Table 4.11 Do you think occupational stress can be minimized?

Response	Frequency	Percent
Yes	133	97.1
No	4	2.9
Total	137	100.0

Source: Field survey, 2012

Table 4.11 shows that as many as 133 (97.1%) of the respondents were of the view that occupational stress can be minimized. The remaining 4 (2.9%) person believed that occupational stress cannot be minimized. An inference from the above is that occupational stress can be minimized. The response of respondents on how occupational stress be minimized is presented below.

Table 4.12 How can occupational stress be minimized?

Response	Frequency	Purpose
Work redesign	34	25.6
Stress Mgt Training	71	53.3
Mgt Development	9	6.8

Organizational Devt	13	9.8
Early detection	6	4.5
Total	133	100.0

Source: Field survey, 2012

The table above reports that 34 (25.6%) and 71 (53.3%) of the respondents said occupational stress in their view respectively can be minimized through work re – designation and stress management training. 9 (6.8%) and 13 (9.8) of the respondents respectively mentioned management development and organizational development. The remaining 6 (4.5%) claimed the best way to use to minimized occupational stress is through early detection. An inference from the above is that the best way to minimized occupational stress is through stress management training.

4.3 UPPORT SYSTEM

Table 4.13 How much does your immediate supervisor go out of his/her way to do things to make work life easier for you?

Response	Frequency	Percent
Very much	48	35.0
Somewhat	43	31.4

A little	40	29.2
Not at all	6	4.4
Total	137	100.0

Source: Field survey, 2012

Table 4.4.1 above shows that 48 (35.0%) and 43 (31.4%) of the respondents respectively said their immediate supervisors very much and somewhat make life easier for them at their work place. 40 (29.2%) claimed their bosses only allow them a little room to make life easier for them with the remaining 6 (4.4%) saying their superiors do not make life easier for them at all. From the above it can be concluded that to a larger extent the superiors of workers of Koforidua Technical University in their actions make life easier for their subordinates in their line of work.

Table 4.14 How much do other people at work go out of their way to do things to make work life easier for you?

Response	Frequency	Percent
Very much	20	14.6
Somewhat	62	45.3
A little	53	38.7
Not at all	2	1.5
Total	137	100.0

Source: Field survey, 2012

The table above reports that 20 (14.6%) and 62 (45.3%) of the respondents respectively claimed other colleagues in the Polytechnic very much and somewhat make life easier for them in the performance of their job. 53 (38.7%) of them said they receive a little support from their other colleagues in making their work easier with the remaining 2 (1.5%) saying their colleagues staff members do not make their work easier for them. An inference from the above is that once again to a larger extent workers receive support from colleague staff in the course of carrying out their job to make life easier for them.

Table 4.15 How much does your spouse, friends and relatives go out of their way to do things to make work life easier for you?

Response	Frequency	Percent
Very much	35	25.5
Somewhat	45	32.8
A little	41	29.9
Not at all	14	10.2

Don't have any such person	2	1.5
Total	137	100.0

Source: Field survey, 2012

Table 4.14 shows that 35 (25.5%) and 45 (32.8%) of the respondents respectively claimed that they receive very much and somewhat support from their friends, relatives and spouse in making their work easier. 41 (29.9%) said they receive little support from their spouse, friends and relatives in making their work easier with 14 (10.2%) claiming that they do not receive any support from anybody. The remaining 2 (1.5%) claimed they do not have any friend, spouse or relative to support them to make their work easier.

Table 4.16 How much do you think you can rely on your immediate supervisor or boss when things get tough at work?

Response	Frequency	Percent
Very much	26	19.0
Somewhat	36	26.3
A little	65	47.4
Not at all	10	7.3

Total	137	100.0

Source: Field survey, 2012

The table above indicates that 26 (19.0%) and 36 (26.3%) of the respondents respectively claimed that they can very much and somewhat rely on their immediate supervisors when things get tough in terms of carrying out their duties. 65 (47.5%) claimed they can rely on their bosses with only a little confidence when things get tough. 10(7.3%) of them said there is no was no way their supervisors can be relied upon when things get tough at their work. It can be concluded from the above that to an extent a worker of the Polytechnic can rely on their immediate supervisors when the going gets tough.

Table 4.17 How much do you think you can rely on other people at work when things get tough at work?

Response	Frequency	Percent
Very much	19	13.9
Somewhat	41	29.9
A little	67	48.9
Not at all	10	7.3

Total	137	100.0

Source: Field survey, 2012

Table 4.4.5 above which shows the distribution on how respondents believe they can rely on their other colleagues when things get tough reports that 19 (13.9%) and 41 (29.9%) of them respectively said they can very much and somewhat rely on colleague staff members. 67 (48.8%) said they can only have a little reliance on their colleague's staff whiles the remaining 10 (7.3) cannot rely on other colleagues staff when the going gets tough at the work place.

Table 4.18 How much do you think you can rely on spouse, friends and relatives when things get tough at work?

Response	Frequency	Percent
Very much	40	29.2
Somewhat	23	16.8
A little	44	32.1
Not at all	30	21.9
Total	137	100.0

Source: Field survey, 2012

Table 4.4.6 shows that 40 (29.2%) and 23 (16.8%) of the respondents respectively said they can very much and somewhat rely on their spouses, friends and relatives when things get tough at work. 44 (32.1%) said a little support can be received from spouses, friends and relatives when things get tough at work. 30 (21.9%) claimed there is no way their spouses, friends and relatives can be relied

upon when things get tough at work.

4.4 OCCUPATIONAL STRESS AND HEALTH

Table 4.19 Do you think your work can affect your health?

Response	Frequency	Percent
Yes	122	89.1
No	15	10.9
Total	137	100.0

Source: Field survey, 2012

The table above shows that as many as 122 (89.1%) of the respondents say their work can affect their health. The remaining 15 (10.9%) were negative in this response to whether their work can affect their health. An inference from the above is that majority of the workers are undertaking stressful work schedule which affects their health. Respondents were then asked how the stress affects their health. Their response is presented below.

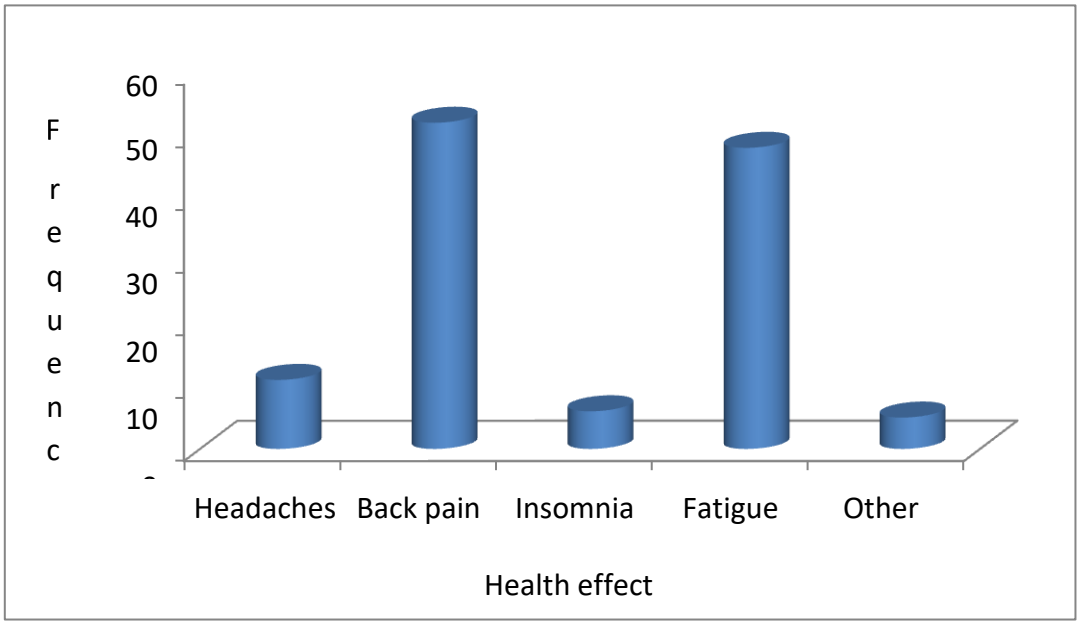

Figure 4.6 How does your work affect your health?

Source: Field survey, 2012

The figure above shows that 11 (9.0%) and 52 (42.6%) of the respondents respectively claimed they suffer headaches and back pain. 6 (4.9%) and 48 (39.3%) of them respectively claimed that the resultant effect of the stress that they go through caused them to suffer insomnia and fatigue. The remaining 5 (4.1%) mentioned migraine amongst others as the effect of stress on them. A conclusion from the above is that the two (2) main resultants effects on stress on the individuals are back pain and fatigue.

Table 4.20 Do you know that occupational stress can cause cardiovascular diseases as hypertension?

Response	Frequency	Percent
Yes	121	88.3
No	16	11.7
Total	137	100.0

Source: Field survey, 2012

Table 4.5.3 shows that 121 (88.3%) of the respondents claimed they were aware of that occupational stress can cause hypertension which is a cardiovascular disease. The remaining 16 (11.7%) said they did not know that stress can cause a cardiovascular disease such as hypertension. Respondents were further asked whether respondents were aware of the fact that exposure to stressors for a long time can cause chronic health problems such as immune system dysfunction. Their response is presented below.

Table 4.21 Did you know that exposure to stressors for a long time can cause chronic health problems such as immune system dysfunction?

Response	Frequency	Percent
Yes	96	70.1
No	41	29.9
Total	137	100.0

Source: Field survey, 2012

The table above shows that 96 (70.1%) of the respondents responded in the affirmative whiles the remaining 41 (29.9%) were negative about it. An inference from the above is that to a larger extent, respondents or the workers of the Polytechnic are aware that exposure to stressors for a long time can cause chronic health problems such as immune system dysfunction.

Table 4.22 Do you know that persons going through stress may resort to substance and alcohol abuse?

Response	Frequency	Percent
Yes	120	87.6
No	17	12.4
Total	137	100.0

Source: Field survey, 2012

Table 4.5.5 indicates that as many as 120 (87.6%) of the respondents were aware that persons going through stress are possible candidates for the use of substances and alcohol use. The remaining 17 (12.4%) responded in the negative when they were asked whether they were aware that that persons going through stress may resort to substance and alcohol abuse.

Table 4.23 How do you perceive that the cause of an illness in the past could be as a result of work stress?

Response	Frequency	Percent

Very high	8	5.8
High	50	36.5
Average	69	50.4
Low	2	1.5
Very low	8	5.8
Total	137	100.0

Source: Field survey, 2012

The table above shows that 8 (5.8%) and 50 (36.5%) of the respondents respectively were of the view that there is a very high and high possibility that an illness in their past can be as a result of work stress. 69 (50.4%) of them were of the view that averagely an illness of an individual currently can be as a result of past work stress. 2 (1.5%) and 8 (5.8%) of the remaining respondents were of the opinion that there is a low and very low possibility that an illness that an individual is currently going through can be as a result of their past work stress.

CHAPTER FIVE

5.0 SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

INTRODUCTION

This chapter summarizes the entire study; the findings of the study, recommendations by the researcher, limitations encountered and directions for future research.

5.1 SUMMARY OF FINDINGS

Investigating occupational stress and its consequences on job performance was the study's main goal. The literature emphasized the importance of the current investigation.

The study provides evidence in favor of the study's goals and further suggests that there is an antagonistic link between job performance and occupational stress. The findings support previous research by Jamal M. (1984) Stress and Job Performance Controversy: an Empirical Assessment; 33:1-21 and Hsiow-Ling (2004) Work Stress and Job Performance in the Hi-Tech Industry: A Closer View of Vocational Education. 3(1):147-50.

5.2 CONCLUSIONS

Based on the analyses of the data, the following conclusions were drawn:

The profile of the majority of respondents were males (57.7%) with the remaining (42.3%) being females. The age groups falls within the age range of 24-34 and majority of respondents fell below the age of forty-five (45) years.

Workload was identified as the major component of occupational stress to respondents as it chalked (55.5%). It was also realized that troubles concentrating on the job was s signal to respondents that

they were under stress. It was noted that

(83.9%) had experienced some of the signs of stress and (86%) report that occupational stress has affected their performance. Finally, it was observed that (63.6%) of respondents experience reduced productivity as a result of occupational stress.

An overwhelming 97% of respondents were of the view that occupational stress can be minimized. They suggested that Stress management training (53.3%) should be instituted to help minimize the effects of work related stress as it will enhance productivity. Most respondents submitted that their jobs sometimes (34.3%) have to work under pressure.

Participants were satisfied with the support they receive from their immediate supervisors with a response rate of (35%) as a result of supervisors making life easier for them at their work places. On the contrary, it was revealed by a (47.4%) that members of staff in tough times receive minimum support from their supervisors. This is very critical in reducing job stress in times of troubles as such these are times when workers would need some form of support from their superiors to help manage some of their stressors.

An overwhelming (89.1%) of respondents were aware that job stress can affect their health negatively as most of the respondents observed that they could contract a cardiovascular disease as a result of job stress. It was noted that workers who experience job stress manifested in the form of back pain and fatigue which scored 42.6% and 39.3% respectively. Drawing from the consequences of the results, it could be concluded members of staff of Koforidua Polytechnic mainly experience back pain and fatigue which could grow in other health implications leading to low

output of those affected.

In summary, the results of the study indicate that there is a negative relationship between job stress and job performance. Those workers who had high level of job stress had low job performance. All

the factors contributing to job stress affected all the categories of staff of Koforidua Polytechnic.

5.3 RECOMMENDATIONS

Based on the findings above the following recommendations have been made:

- Koforidua Polytechnic might be very competitive in the provision of excellent higher education by adopting a well-designed, structured, and managed work helps to preserve and enhance individual well-being. This is because the working population there is young.
- The Polytechnic administration should focus on resolving these problems because workload conflict and job-related stress caused by a lack of support from managers during trying times were major problems for employees. For the benefit of the staff, department or section heads must advocate for a lack of resources, such as insufficient staff and equipment.
- Stress reduces performance because it causes the person to exhibit signs of stress, which have an impact on their productivity. So, by reducing position ambiguity, boosting formal organizational communication with employees lowers stress. The ability to resolve problems between superiors and subordinates is a benefit of open communication. Conflicts that go unsolved can raise stress levels and are a result of ineffective communication.
- Colleague and supervisor support is crucial in lowering stress. In difficult circumstances, supervisors must acknowledge the excellent work and extraordinary contributions of employees to keep them engaged. They will learn by example that coworker help is crucial, thanks to the promotion of a supportive culture.
- To enhance employee health and intrapersonal relationships, proper stress management should be woven into the Polytechnic administration. A person must maintain a high level of personal health. Because organizations frequently produce the stress, organizational level interventions

are necessary for the prevention and treatment of workplace stress. It is crucial to have a culture that values openness and understanding over criticism.

5.4 SUGGESTIONS FOR FURTHER STUDIES

Stress at work is a natural part of life. Therefore, additional research can be done to develop programs that effectively reduce workplace stress when the current study is still insufficient. The scope of this study was the Koforidua Polytechnic. However, research can be done to help shed light on the trends in stress levels across different professions. This investigation focused on the impact of workplace stress on employees at Koforidua Polytechnic's ability to do their jobs. Similar comparisons between intra-professional groups, such as primary and high school teachers, or between privately and publicly employed professionals and employees, can be used to perform useful investigations.

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QUESTIONNAIRE

This survey is to assess occupational stress and its effects on job performance. You have been randomly selected to take part in the research. I shall be grateful if you could spare a few minutes to answer the questions that follow. Please do not write your name. Be assured also that your identity would be fully protected.

HOW TO COMPLETE THE QUESTIONNAIRE

Once you have the questionnaire, please read the statements in each section and answer by ticking (√) the response that best reflects your opinion.

- Do complete the questionnaire quickly- it should take about 10 minutes
- Do not spend too much time on each question- your immediate response is normally the most valuable.

Section 1: Personal Information on Respondents

1. Gender: Male [ ] Female [ ]

2. How old are you? (i) 15 – 24[ ] (ii) 25 – 34 [ ] (iii) 35 – 44 [ ] (iv) 45 – 54 [ ]

   (v) 55 and above [ ]

3. Level of Education: (i) MSLC/JHS [ ] (ii) _O‘ Level/SSSCE/WASSCE [ ]
   (iii) A‘ Level [ ] (iv) Diploma [ ] (v) Graduate [ ]

   (vi) Post Graduate [ ] (vii) None [ ] (viii) Other Specify ……

4. Position/Rank: (i) Academic Staff [ ] (ii) Administrative Staff [ ]

5. Status: (i) Junior Staff [ ] (ii) Senior Staff [ ] (iii) Senior Member [ ]

6. Marital Status: (i) Single [ ] (ii) Married [ ]

Section 2: Stress and its Effects on Performance

7. Have you heard about occupational stress? (i) Yes [ ] (ii) No [ ]

8. Which medium of communication did you hear it from?
(i) Radio [ ] (ii)TV [ ] (iii) News Papers [ ]

(iv) Other(s) Specify…….

9. To you, what constitute Occupational Stress?
(i) Workload [ ] (ii) Role Overload [ ] (iii) Role Ambiguity [ ]

(iv) Role Insufficiency [ ] (v) Other (s) ……..

10. What do you think are the signals of occupational stress? You can provide multiple answers.

(i) Feeling anxious, irritable or depressed [ ]

(ii) Apathy, Loss of interest in work [ ]

(iii) Problems sleeping, Fatigue [ ]

(iv)Trouble concentrating [ ](v)

Other (s) …….

11. Have you ever experienced any of the signs of occupational stress?
(i) Yes [ ] (ii) No [ ] (iii) Don‘t know [ ]

12. Does occupational stress have any effect on your performance?
(i) Yes [ ] (ii) No [ ] (iii) Don‘t know [ ]

13. If you answered **yes** to the above what effects did it have on you?
(i) Absenteeism [ ] (ii) Reduced productivity [ ] (iii) Low morale [ ]

(iv) Poor work relations (v) Other (s) …….

Section 3: Control Scale

14. How much influence do you have over the availability of supplies and equipment you need to do your work?
(i)Very Much [ ] (ii) Some-What [ ](iii) A little [ ] (iv) Not At All [ ]

(v) Don‘t Know [ ]

15. How much influence do you have over the order in which you perform tasks at work?
(i)Very Much [ ] (ii) Some-What [ ] (iii) A little [ ] (iv) Not At All [ ]

(v) Don‘t Know [ ]

16. How often does your job leave you with little time to get things done?
(i) Rarely [ ] (ii) Occasionally [ ] (iii) Sometimes [ ]

(iv) Fairly Often [ ] (v) Very Often [ ]

17. Do you think occupational stress can be minimised? Yes [ ] No [ ]

18. If you answered yes to the above, how?
(i) Work Redesign [ ] (ii) Stress Management Training [ ]

(iii) Management Development [ ] (iv) Organisational Development [ ]

(v) Early detection [ ]

19. In what way(s) do you think occupational stress could be minimized? (i) ……
(ii) ……..
(iii) …… .
(iv) ……..

Section 4: Support System

How much does each of these people go out of their way to do things to make your work life easier for you?

20. Your immediate supervisor (boss)
(i) Very Much [ ] (ii) Some-What [ ] (iii) A Little [ ]

(iv) Not At All [ ] (v) Don‘t have Any Such Person [ ]

21. Other people at work
(i) Very Much [ ] (ii) Some-What [ ] (iii) A Little [ ]

(iv) Not At All [ ] (v) Don‘t have Any Such Person [ ]

22. Your spouse, friends and relatives
(i) Very Much [ ] (ii) Some-What [ ] (iii) A Little [ ]

(iv) Not At All [ ] (v) Don‘t have Any Such Person [ ]

How much can each of these people be relied on when things get tough at work?

23. Your immediate supervisor (boss)
(i) Very Much [ ] (ii) Some-What [ ] (iii) A Little [ ]

(iv) Not At All [ ] (v) Don‘t have Any Such Person [ ]

24. Other people at work
(i) Very Much [ ] (ii) Some-What [ ] (iii) A Little [ ]

(iv) Not At All [ ] (v) Don‘t have Any Such Person [ ]

25. Your spouse, friends and relatives
(i) Very Much [ ] (ii) Some-What [ ] (iii) A Little [ ]

(iv) Not At All [ ] (v) Don‘t have Any Such Person [ ]

Section 5: Stress and Health

26. Do you think your work can affect your health? (i) Yes [ ] (ii) No [ ]

27. If you answered yes to the above how does your work affect your health?

(i) Headac

hes [ ] (ii) Back Pain [ ] (iii) Insomnia [ ] (iv) Fatigue [ ](v)

Other (s) ……

28. Do you know that occupational stress can cause cardiovascular diseases such as hypertension?
(ii) Yes [ ] (ii) No [ ]

29. Did you know that exposure to stressors for a long time can cause chronic health problems such as immune system dysfunction? (i) Yes [ ] (ii) No [ ]

30. Do you know that persons going through stress may resort to substance and alcohol abuse?
(i) Yes [ ] (ii) No [ ]

31. How do you perceive that the cause of an illness in the past could be as a result of work stress?

(i) Very high [ ] (ii) High [ ] (iii) Average [ ] (iv) Low [ ] (v) Very Low [ ]

32. To what extent do you think occupational stress has had any effect on your health? (i) ……
(ii) ……
(iii) ……
(iv) ……

Thank you.

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