# OCCUPATIONAL STRESSORS IN DIAGNOSTIC RADIOGRAPHERS WORKING IN PUBLIC HEALTH FACILITIES IN THE ETHEKWINI DISTRICT OF KWAZULU–NATAL.

This work is submitted in fulfilment of the requirements for the Master of Technology: Radiography degree at the Durban University of Technology.

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## Declaration

I, Nkululeko Phalson Gam, do hereby declare that this dissertation represents my own work and that as far as I know, no other similar dissertation exists.

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## Dedication

This dissertation is dedicated to my dearest wife Lulama and my children, Amanda, Athenkosi, Lelethu and Buchule.

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## Abstract

### Introduction

Occupational stress has negative effects on both the organisation and individuals employed by the organisation. In the organisation it can result in high levels of absenteeism, reduced productivity and compromised levels of patient care. Furthermore individuals affected by stress may suffer from raised levels of tension, mental fatigue, insufficient sleep, anxiety, and anger. Interventions to prevent both organisational and individual effects of occupational stress may only be implemented once stressors in an occupational group have been identified hence the need for the current study.

### Purpose

The purpose of the study was to investigate occupational stress in diagnostic radiographers working in public healthcare institutions in the eThekwini District of KwaZulu-Natal using a quantitative research approach.

### Method

A cross sectional survey using a validated questionnaire with some open and closed-ended questions was utilised. Radiographers working in public hospitals in the eThekwini District of KwaZulu-Natal were invited to participate in the study. Respondents were asked to answer 60 closed ended and four open ended questions. Open ended questions afforded the respondents an opportunity to express their opinions. Quantitative data was analysed using the Statistical Package for Social Sciences (SPSS) version 21.0. Inferential statistics included the use of reliability coefficients, correlations and chi square test at a 95% confidence level. Open ended questions were analysed using thematic analysis.

**Results**

One hundred and one questionnaires were administered and forty three were returned which resulted in a 43% response rate. The mean age of respondents was 31.7 years and 88.4% were females. The majority (67.4%) were in possession of a National Diploma in Radiography. Seventy two percent worked in regional hospitals. The majority (41.8%) were employed as chief radiographers.

Most radiographers affected by stressors were those working in regional hospitals. The three main sources of stress in order of response were workload, faulty equipment and staff shortages. In addition, bullying, long and strenuous shifts as well as training of students were also found to be stressors. Physical exercises, counselling and wellness days were used to reduce stress whilst employment of more staff, attending to faulty equipment, team building, reducing workload, and improved working conditions were suggested as methods of reducing stress amongst radiographers.

**Conclusion**

Radiographers working in the eThekwini District were stressed by a number of factors in their work places. Radiographers suggested ways that can be employed to reduce stress in their departments. A close cooperation between radiographers; radiography supervisors; institutional, district and provincial managers is recommended in order to address the challenges faced by radiographers.

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## Abbreviations

| | |
|---|---|
| BTech | Bachelor of Technology |
| BSU | Bed Side Unit |
| CHC | Community Health Center |
| CPD | Continuous Professional Development |
| CR | Computed Radiography |
| CT | Computed Tomography |
| DoH | Department of Health |
| DR | Digital Radiography |
| EAP | Employee Assistance Programme |
| HPCSA | Health Professionals Council of South Africa |
| HSE | Health and Safety Executive |
| IALCH | Inkosi Albert Luthuli Central Hospital |
| KZN | KwaZulu-Natal |
| MRI | Magnetic Resonance Imaging |
| NHS | National Health Services |
| OHS | Occupational Health and Safety |
| OS | Occupational Stress |
| PSI | Pharmacist Stress Inventory |
| SA | South Africa |
| SPSS | Statistical Package for Social Sciences |

| | |
|---|---|
| UK | United Kingdom |
| USA | United States of America |
| WRS | Work Related Stress |

# CHAPTER 1

# INTRODUCTION

## 1.1 Background to the problem

It is estimated that South Africa loses R18 billion each year due to absenteeism and loss in productivity (Absenteeism a headache in South Africa 2005: 9). In addition some industries in countries like Canada have lost more than $ 1 million due to stress related absenteeism (Carrick 1995). It is vital for every profession to identify the stressors that affect the individuals within it so as to be able to manage the stressors effectively, hence the undertaking of the current study. There is no known study that has investigated stress amongst radiographers in the eThekwini District of KwaZulu-Natal. This may imply that this topic has not been researched even though anecdotal evidence suggests that work related stress is impacting negatively on service delivery in this district.

Verrier and Harvey (2010: 118) have identified the major categories of work related stressors as demands, control, social support, manager's support, relationships, role, and organisational change. Excessive workloads, emergencies, patient demands, shift work, staff shortages, high patient volumes, on call demands, inadequate facilities, poor training, difficult colleagues, lazy staff, poor communication and unsupportive management are the stressors faced by healthcare workers including radiographers (Eslick and Raj 2002: 49, Rothmann 2007: 4; Verrier and Harvey 2010: 121). These stressors pose a huge challenge to maintaining good service delivery to patients and impact negatively on the performance of radiographers.

When the management of these stressful working conditions is ineffective, excessive amounts of stress affect the physical and emotional well-being of radiographers. Understanding the stressors and how to manage them will

make it easy for radiographers to find solutions to stressful situations. This will make radiographers more motivated and productive, thereby contributing to quality service delivery.

## 1.2 Aim and objectives of the study

The aim of the study was to investigate causes of occupational stress among diagnostic radiographers in the eThekwini District of KwaZulu-Natal using a descriptive survey of a cross-sectional design so as to establish a baseline study with which future studies in the eThekwini District can be compared.

The objectives of the study were to:

- Determine the causes of occupational stress amongst diagnostic radiographers.
- Determine the methods currently used to reduce occupational stress in diagnostic radiographers.
- Investigate methods that can be used to reduce occupational stressors in diagnostic radiographers.
- Determine whether there are any significant differences between the variables producing occupational stress in radiographers.

## 1.3 Significance of the study

The results of this study could provide radiographers and their managers with the necessary knowledge and skills about various stressors that radiographers are exposed to especially in the eThekwini District of KwaZulu-Natal. This will enable them to plan interventions that will prevent stress, thereby ensuring adequate service delivery.

Demands in radiography departments have increased over the years (Verrier and Harvey, 2010: 116) due to:

- an increase in the range of diagnostic procedures to be conducted.
- an increase in the availability of radiological modalities.
- increased stress to lower the patient and consultant waiting times.

- highly informed patients and their family members due to awareness of patient rights.
- a lack of preparedness of radiographers in dealing with clinical challenges.

A number of studies reviewed have indicated unacceptable high levels of stress amongst radiographers and other healthcare professionals (Blaauw et al 2013: 133, Eslick and Raj 2002: 50, Makanjee 2004: 104, Raj 2006: 120, Ugwu et al 2007: 126). These studies supported the notion that members of the healthcare team were unhappy, dissatisfied, actively seeking other jobs, attending psychological treatment and showing enormous levels of anxiety. The current study could therefore provide evidence to radiographers about their stressors and how best to manage stressful conditions. This would help radiographers to reduce their stress levels thereby enhancing their efficiency.

It is important for radiographers to understand the factors that may influence their level and causes of stress so as to be able to manage their stressors appropriately. Most hospitals in this district participate in the training of student radiographers. Raised levels of stress are detrimental to the teaching and learning that needs to take place at these facilities.

It was noted during literature search that there is limited research by South African radiographers around the area of occupational stress. It is however interesting to note that extensive research on stressors has been conducted amongst nurses and doctors in South Africa. These studies include one study undertaken in the KwaZulu-Natal province (Rothmann 2007). This therefore raised a need for research on work-related stressors to be undertaken among radiographers in this part of the world. This study explored occupational stressors amongst diagnostic radiographers, as well as solutions that can be implemented by both radiographers and employers to alleviate stress at work.

Twenty percent of South Africans reside in KwaZulu-Natal thus making the province the second most populated province in South Africa (Statistics SA 2012). The province also possesses a large number of vacant posts (Human Resources for Health strategy for the Health sector: South Africa: 2012/13 – 2016/17).

Radiography plays a pivotal role in the process of diagnosis and management of highly complicated cases. This requires radiographers to be abreast in the use of technical equipment and performance of innovative radiographic techniques. These situations could therefore result in radiographers within the eThekwini District being more stressed than other radiographers working in other parts of KwaZulu-Natal.

## 1.4 Definition of terms and clarification of concepts

The following terms and concepts are used throughout the study and have been described below.

### 1.4.1 Occupational stress

The Health and Safety Executive (2005) defined occupational stress as “the adverse reaction people have to excessive pressures or other demands placed upon them”. In this study occupational stress refers to negative reactions that employees display or feel when they are subjected to demands that are greater than their capabilities. When terms like work related stress, job stress and work stress are used, they will bear the same meaning as occupational stress.

### 1.4.2 The nature of stress

When stress results from negative actions and has negative consequences, it is called distress while positive or good stress is refed to as eustress. A promotion may result to eustress while the individual is still learning about the new job. This study was concerned about distress amongst radiographers. The following characteristics are true about stress.

#### 1.4.2.1 Subjectivity of stress

Stress is subjective in nature as different individuals may be subjected to similar conditions but their stress can be at varying degrees (Chang and Lu 2009: 592).

#### 1.4.2.2 Demand Control Model

Karasek and Theorel (1979: 296) claimed that occupational stress would be higher if the following occurred:

##### 1.4.2.2.1 Personal – Environmental Fit Model

This model states that the lack of personal environmental fit may trigger occupational stress if one is under demanded or over-demanded. This model further explains that for each individual there are optimal levels of demands for their capacity. When these levels are reached, occupational stress is reduced. Therefore too little or too much demands result in occupational stress. However, this study investigated stress due to increased demands on an individual.

### 1.4.3 Stressors

Factors that have the ability to cause stress on an individual are referred to as stressors. This study investigated the impact of stressors such as demands, control, social support, manager's support, relationships, role and organisational change on radiographers.

### 1.4.4 Burnout

A reaction to chronic occupational stress characterised by physical, emotional and defensive coping. Burnout results when occupational stress is not well managed (Rice 1999: 210).

## 1.5 Flow of the dissertation

The dissertation has been organised according to chapters one to six followed by the reference list. Appendices have been inserted at the end.

### 1.5.1 Chapter 1: Introduction

The background, the aim, the objectives, significance of the study, clarification of terms as well as flow of the thesis are detailed in this section of the study. An indication of the design, plan and methodology of the study is given in this section including a brief outline of what is to be expected in the rest of the thesis.

### 1.5.2 Chapter 2: Literature Review

A comprehensive critical review of existing literature was undertaken with the objective of linking previous studies that have been conducted on stress amongst radiographers to the current study. The introductory section of the literature review will also give an indication of what literature has been included as well as how that literature relates to the current study. This section is concluded with how the literature was used to inform the methodology of the current study.

### 1.5.3 Chapter 3: Research Design and Methodology

The type and design of the research including sample design, the sampling techniques used and how the sample size was chosen are explained in detail in this part of the study. The chapter also describes methods employed in data collection. Data capturing and editing, data analysis and sources of error in the data collected are explained in detail at the end of this chapter.

### 1.5.4 Chapter 4: Results

Results are summarised and presented using narratives, tables and figures. Main trends and patterns are provided in relation to the objectives of the current study.

### 1.5.5 Chapter 5: Discussion

This chapter is used to interpret the results presented in chapter four. A discussion of the significance of these results as well as how they add to existing knowledge is also presented here. This chapter is also used to

reflect on whether the aims and objectives have been achieved. Results are also compared to other similar studies.

### 1.5.6 Chapter 6: Conclusion and Recommendations

In this chapter the conclusions and recommendations based on the findings of the study are presented. Specific actions to be undertaken by radiographers, supervisors, radiography managers and senior managers in hospitals within the eThekwini District as well as leaders in the KwaZulu-Natal Department of Health are stated in this section. Limitations to the current study are identified and recommendations to improve these are suggested. Recommendations for further research studies are also given in this chapter.

# CHAPTER 2

# LITERATURE REVIEW

## 2.1 Introduction

Literature search has proved that research related to occupational stress in radiography is very limited and the topic remains disappointingly misunderstood. This chapter will describe how literature was used to develop constructs in the current study.

A desktop review employing a variety of electronic databases such as MEDLINE, Science Direct, ProQuest health medical complete and ProQuest health management was undertaken. Some sources were obtained through the assistance of supervisors, colleagues and use of the Durban University of Technology (DUT) library. Manual searches were completed by the use of reference lists from selected articles to obtain other papers relevant to the topic. The key words used were stress, stressors, radiography, burnout, support, demands, job, and occupational.

Lua and Imilia (2011: 13) compared levels of job stress amongst healthcare employees and found that radiographers were the most stressed group. In addition, certain work characteristics have also been identified in a National Health Services (NHS) study. These accounted for differences in stress levels between healthcare workers working in public health institutions and those working in private health facilities (Eslick and Raj 2002: 50). The characteristics identified were high work demands, low level of influence over decisions, poor feedback on performance, and conflict between various roles of an employee.

A cross-sectional survey undertaken by Rothmann (2007: 4) on South African hospital pharmacists revealed that job demands, pharmacy-specific

stressors and a lack of resources were the major causes of stress. A Pharmacist Stress Inventory (PSI) of 106 items was distributed to pharmacists across nine provinces of South Africa (SA). It became evident from the results that SA hospital pharmacists experienced high levels of stress. The reasons for this were working overtime, lazy colleagues, crisis situations, lack of staff, critical decision making, low salaries, frequent interruptions and too much paper work.

Working long hours is quite prevalent among radiographers as they compensate for severe staff shortages and high demands. In 2012, another South African cross-sectional descriptive study (Govender, Mutunzi and Okonta) was conducted. The study used a self-administered standardised questionnaire. It was carried out among medical doctors employed in four hospitals of the Ngaka Modiri Molema District of the North West province. The results showed that 51% of the respondents were morbidly stressed due to working long hours.

Examination of the levels of stress among nurses in two rural hospitals in the central region of the Limpopo province showed that nurses did not have significantly higher levels of stress than the control group (Madu and Mamomane 2003: 210). However, there could be flaws in the nature and method of the study employed. This is possible as the authors stated that a longitudinal rather than a cross-sectional study could have yielded more authentic results.

Four of the studies on radiographer related stress research were conducted in Nigeria. The first one was a multi-centre study aimed at identifying the main causes and levels of psychosocial stress among radiographers in South Eastern Nigeria (Ugwu et al 2011: 13). A similar study was undertaken by Eslick and Raj (2002: 51) in Australia. Both studies revealed that the major causes of stress among radiographers were patients demands, radiography staff, technical problems, equipment problems, staff support, on-call,

radiographic exposure, poor salaries, workload, teaching and management. Another Nigerian study (Ugwu et al 2009) examined both biomechanical and psychosocial predictors of stress. The objective of this study was to establish whether sonography responsibility was causing occupational stress in radiographers.

In addition to identifying stressors, another study (Ugwu, Ahamefule and Nwobi 2008) examined most popular and effective coping methods used by radiographers in preventing and reducing occupational stress. This study was also different from most studies as it was qualitative with the researchers interviewing the respondents. A number of probing questions relating to their experiences at work and after work, perceived stressors and ways of coping with stress, were posed to radiographers. With regards to daily experiences, radiographers reported that there were poor radiation protection measures in place.

On the positive side, respondents were encouraged by role extension into ultrasonography responsibilities. This was contrary to the findings of the study conducted in the same region in 2009 by the same main author and different colleagues. Other causes of stress were cited as reduced manpower, lack of a booking system, instability of power supply, management attitude, poor relationships with colleagues, equipment faults and, very high workload. Radiographers recommended duty scheduling, reducing working hours and taking time to relax in the relaxation room as methods of reducing stress.

A third study on the South Eastern state of Nigeria (Ugwu et al 2007) investigated the incidence of occupational stress in radiographers. Anxiety level was 45.3% indicating that radiographers were extremely stressed. Results yielded evidence of biomechanical stress in all the regions of the body examined. The major sources of stress reported were clinical correlation ambiguity (inability of an ultrasonographer to correctly match

clinical findings with information provided in the request form), heavy work schedule and being on-call.

Research conducted in Germany amongst physicians, radiographers, nurses and physicists working in radiotherapy departments (Sehlen et al 2009: 6) showed that nurses and physicians suffered the highest level of job stress. The greatest sources of stress in physicians, nurses and radiographers arose from structural conditions (like underpayment and ringing of the telephone) as well as stress induced by compassion. Stressors specific to radiographers were disease progression in patients, high physical workload and side effects of radiation treatment on patients. It was however quite encouraging to note that in spite of all the stressors, these workers were committed to keep the patients alive.

In India, whilst investigating the relationship between job stress and general health in radiographers in the Tirunelvi city in the state of Tamil Nadu, Rajan (2012: 7) found that there was inadequate staff in relation to the work load and this was in keeping with all the studies cited above. In par with the study of Ugwu et al (2011: 4), this study also found that exposure to ionising radiation was the foremost stressor among radiographers. Exhaustion was also ranked number one in the impact of stress on radiographers. In addition radiographers coped by talking to other people about their stressors.

A purely qualitative study was conducted in the UK by Probst and Griffiths (2009). Its main aim was to discover and investigate the current and developing roles and responsibilities of therapists and the impact of these factors on job satisfaction. Radiographers expressed that job satisfaction can be obtained by career planning, supporting Continuous Professional Development (CPD) activities, inclusive policies for development work, job redesign, leadership skills and communication strategies.

Another very relevant study which was the last one among the studies performed in UK was carried out by Rutter and Lovegrove in 2008. Its aim was to establish the level of stress and its predictors among NHS employed radiographers. Questionnaires were mailed to all mammography, radiotherapy and ultrasound radiographers. Diagnostic radiographers were stratified by geographic region and then a random sample was approached. Results showed a high level of stress among all four disciplines of radiographers. The impact of general causes of occupational stress being role ambiguity, role conflict and work problems were examined. It was noted that for both role conflict and job uncertainty, the effects on perceived stress were diminished when there was strong social support but this was not the case when support was weak.

The first one of the UK studies identified was conducted in 2010 by Verrier and Harvey. This study examined the causes of work related stress (WRS) in a UK district hospital. The study used closed and open ended questions as is the case in the current study. The Health and Safety Executive (HSE) Indicator Tool for WRS was used to obtain data regarding closed ended question. Data based on open ended questions was collected by means of two free response questions plus a comments box. The most radiographer cited reasons for work pressure in order of frequency of citing were staff shortages, heavy workload, on call demands, inadequate facilities, poor training, behaviour of colleagues, poor communication, and unsupp-ortive management. On the other hand the open ended questions proposed recommendations for reducing WRS, namely increased staffing levels, improved communication, feedback, better management, better team working, staff consultation, regular breaks and improved facilities.

In South Africa Makanjee (2006) investigated the impact of WRS and organisational commitment on diagnostic radiographers. It was clear from the results of this study that the role of management was rated poorly by radiographers in a number of areas including decision making, communication of

information, welfare of staff, planning and organisation which all led to WRS, low perceived organisational support and poor organisational commitment.

All of these studies demonstrated that WRS places a major burden on staff and the ability of radiography departments to deliver services optimally. This has been noted through conversations with radiographers, radiography managers and students in the eThekwini District. Unfortunately very little or nothing has been done to amend the situation. There is a need to research predictors of stress in radiographers within the eThekwini District.

## 2.2 Symptoms of occupational stress

Workers spend most of their waking time at work. It is therefore quite important for co-workers and supervisors to be able to identify symptoms of occupational stress so as to intervene adequately when necessary. Rice (1999: 195) states that there are three major groups of symptoms of occupational stress. These are psychological, physical and behavioural symptoms.

### 2.2.1 Psychological symptoms of occupational stress

A number of studies reviewed (Cho et al 2008: 50, Rice 1999: 195, Tennant 2001: 702) revealed the following symptoms in this category:

- Anxiety, tension, confusion and irritability.
- Feelings of frustration, anger and resentment.
- Suppression of feelings, withdrawal and depression.
- Job dissatisfaction.
- Feelings of isolation and alienation.
- Loss of concentration and reduced intellectual functioning.
- Loss of creativity and reduced self-esteem.

Psychological disorders may be aggravated by day to day stressful conditions. After reviewing a number of studies on psychological stressors, Tennant (2001: 702) concluded that psychological morbidity in the workplace

would remain a challenge for a long time. The same study observed that enduring daily occupational stressors could contribute to psychological disorders. A study amongst Korean employees (Cho et al 2008: 50) expressed that depression was higher amongst females, single or divorced individuals and employees working for long hours.

### 2.2.2 Physical symptoms of occupational stress

The following symptoms have been revealed by some studies (Piko 1999: 160, Raj 2006: 115, Rice 1999: 196 and Roland: 2014: 469):

- Increased heart rate, blood pressure, and risk of cardiovascular disease.
- Gastrointestinal disorders such as irritable bowel syndrome, colitis and ulcers.
- Increased frequency of physical injuries.
- Physical fatigue.
- Respiratory problems.
- Skin disorders.
- Headaches, low back pains, and muscular tension.
- Sleep disturbances.
- Impaired immune functioning.

Unhealthy working conditions may result to a range of physical stressors as listed above. A study of occupational stress amongst Mauritian nurses (Roland 2014: 469) found that almost 85% of respondents agreed that insomnia was directly related to occupational stress. A significant number of respondents within the same sample reported headaches, cramps and muscle spasms. Almost a quarter (23.3%) of respondents in another study (Nakata et al 2004: 1723) were suffering from insomnia. On the other hand, a Nigerian study (Owalabi et al 2012: 7) revealed that more than a quarter (26.2%) of the respondents were stressed. A large percentage of those stressed suffered from hypertension whilst a very small number of those

unstressed had hypertension. Another implication of these sicknesses would be absence from work. This would have a negative impact to patients, organisation and radiographers themselves.

### 2.2.3 Behavioural symptoms of occupational stress

The following behavioural symptoms of occupational stress are evident in a number of studies (Piko 1999: 160, Rice 1999: 197, Roland 2014: 469, Wainwrihgt and Calnan 2002: 59):

- Procrastination and absenteeism.
- Lowered performance and productivity.
- Increased intake of alcohol and drugs.
- Overeating leading to obesity.
- Undereating resulting in weight loss.
- Increased risk taking behaviour including gambling and reckless driving.
- Aggression, vandalism and stealing.
- Reduced relationships with family and friends.
- Suicide or attempted suicide.

Occupational stress may result to a variety of behavioural changes as listed above. Piko (1999: 160) stated that the frequency of common psychological symptoms may lead to behavioural changes such as increased alcohol drinking, heavy smoking and frequent use of drugs and sleeping medication. A study by Chang and Lu (2009: 600) found that personnel with lowest levels of education were more likely to absent themselves from work when compared to those with post graduate qualifications. This study concluded that there were differences in behaviour amongst various occupational groups. Workers with longer years of service were found to have lesser intension to leave when compared to those with lesser years of employment by the same company (Chang and Lu 2009: 600).

## 2.3 Stressors among radiographers

Despite the steady increase (between 0.6% and 6.3%) in the number of radiographers during the period 2002 – 2010, the supply of radiographers does not match the demand for these professionals and their services. In KwaZulu-Natal there were 938 diagnostic radiographers registered by the Health Professionals Council of South Africa (HPCSA) in 2013 with 1.42 radiographers servicing a population of 10 000. This was below the national norm, in which 1.53 radiographers rendered services to a population of 10 000 people. Literature (Verrier and Harvey 2010: 118) has revealed that the major categories of stressors are demands, control, social support, manager's support, relationships, role, and organisational change. These categories are discussed further below.

### 2.3.1 Demands

Demand is described by the concise South African dictionary (2007) as a strong consistent and commanding request for something. In a working environment demands can be explained as those aspects of the job that are required from the employee which are found to be very difficult or impossible to deliver. In addition to radiographer challenges discovered by Verrier and Harvey (2010: 121), further demands such as emergencies, patient demands and shift work were obtained by other authors (Eslick and Raj 2002: 49; Rothmann 2007: 4).

An increase in the number of violence and emergency related cases results in an increase in the number of patients and procedures to be managed by the healthcare team. In addition the number of emergency and violent cases is still on the rise (Seedat et al 2009: 1011). On the other hand the eThekwini District is a major referral center for healthcare in KwaZulu-Natal as its hospitals contain the most sophisticated equipment and expertise. Patients with complications from all other districts of the province are therefore referred to the hospitals in the eThekwini District. This increases workload and causes more stress to radiographers in this region.

A service based on patient fulfilment can result to high levels of stress in the work place (Ugwu et al 2007: 123). In addition better informed patients also result to high levels of stress on individuals serving such patients (Saha et al 2011: 1). These conditions are worsened by raised duties of healthcare workers and other patient demands (Wu et al 2010: 161) as well as increased expectations from the public (Lua and Imilia 2011: 5). A considerable amount of stress is also caused by annoyed, distraught and accusing relatives (Saha et al 2011: 3).

Lazy staff members in any work force tend to exert more pressure on those workers that possess more work ethics as the later have to perform a larger bulk of the workload. Two studies performed in the United Kingdom (French 2004: 18 and Verrier and Harvey 2010: 122) revealed that underperforming employees result in higher levels of stress. The South African public healthcare delivery system is characterised by poor administrative management, low morale, lack of funding and brain drain (Chopra et al 2009: 1023) and therefore lazy staff members will contribute to higher stress levels.

The magnitude and efficiency of radiography departments was previously measured by the number of general x-ray rooms that the department possessed. The development of technology has resulted in the ability of departments to offer cross sectional imaging, high resolution fluoroscopic imaging and many more forms of imaging. As a result, radiography departments now pride themselves on the range of procedures and techniques that can be performed. These technological advances also cause high levels of stress in radiographers as these pieces of equipment are more complex (French 2004:18; Kubik-Huch et al 2010: 377; Ugwu, Erondi and Umeano 2011: 13). The move to install these high profile pieces of equipment would be welcome as public hospitals continuously receive demands for fast, extraordinary quality services (Lua and Imilia 2011: 6). Furthermore as departments install new pieces of equipment, higher numbers of staff are required because radiographers become distributed to small

sections within the radiography department whilst rendering of conventional radiography services is still in growing demand.

After 20 years of being a democratic state, South Africa is still overwhelmed with communicable and non-communicable diseases and high maternal and child mortality (Chopra et al 2009: 1023). Non-communicable diseases make up 28% of the burden of disease in South Africa (Mayosi et al 2009: 935). The country also recorded almost 60 000 deaths caused by injuries during the year 2000 of which more than 50% were due to interpersonal violence (Seedat et al 2009: 1011). The growing demand for radiographic services imposed by the above burden of disease and injury in the eThekwini District exacerbates the demands placed on radiographers in this district.

High workload stresses employees more than any other stressor (Eslick and Raj 2002: 49, Rothmann 2007: 4, Verrier and Harvey 2010: 121). Several investigators (Akroyd, Caison and Adams 2002: 217, Daugherty 2002: 309, Eslick and Raj 2002: 50, Kubik-Huch et al 2010: 380, Lawrence, Poggenpoel and Myburg 2011: 5, Probst and Griffiths 2009: 152, Raj 2006: 117, Rajan 2012: 8, Reiner and Krupinski 2011: 4, Romano 2012: 63, Ugwu, Ahamefule and Nwobi 2008: 7, Ugwu, Erondu and Umeano 2011: 13, Ugwu et al 2007: 125) have affirmed that workload is a significant stressor among radiographers and other healthcare employees. High work overload is caused by the severe shortage of radiographers, increasing demand for radiological services, reorganisation of health services, improved orientation of users, increased regulations and demands for continuous quality improvements, aging population, increasing profit margins whilst maintaining reasonable patient care and increased intellectual demand per patient.

Effects of high levels of workload can be quite difficult to endure and impossible to reverse. Ugwu, Erondu and Umeano (2011: 13) argue that role expectations and specifications may be blurring. This can result in human

errors due to burnout (Romano 2012: 63) and in radiotherapy these errors may affect the treatment of cancers (Probst and Griffiths 2007: 150).

The other costly consequence of occupational stress is financial drain to the organisations and the country. The Health and Safety Executive (2010) revealed that internationally occupational stress costs were estimated to be 5.4 billion US dollars. These costs were due to work absence, higher turnover, lower productivity, litigations, occupational injuries and related compensations (European Foundation for the Improvement of Living and Working Conditions 2007 and Health and Safety Executive 2011).

Various solutions to these challenges have been suggested and these include training, hiring and retaining of radiographers, motivation of radiographers, conducting burnout workshops, development of management policies to monitor, detect and prevent stress in radiographers and research of factors resulting to staff turnover (Verrier and Harvey 2010: 122). Due to the fact that patient volume is not a variable that can be manipulated, work should be revised in order to enhance departmental effectiveness.

There is an inverse relationship between high workload and the number of personnel providing a service. The serious shortage of diagnostic radiographers in South Africa causes higher levels of stress. In addition the government has intervened by declaring radiography a scarce skill. An allowance was therefore introduced as an incentive to attract radiographers to work in public health institutions. In addition the Occupational Specific Dispensations (OSD) was implemented in 2007 to improve salaries of South African civil servants.

Working shifts in addition to the usual 08:00 am to 16:00 pm shift is another factor that may result in occupational stress (Ross and Altmaier 1994: 42). Radiography has responded to the demand for services by introducing shift work. Rajan (2012: 7) investigated the relationship between job stress and

general health among radiographers in Tamilnadu.This study revealed that shift work is a stressor. This finding is in keeping with the fact that shift work is associated with psychosocial difficulties such as the fact that the societal activities are daytime orientated (Ross and Altmaier 1994:43). Shift work can result in individuals experiencing domestic pressure like the inability to be at home at the same time as the sexual partner or failure to take care of children. In addition, Sehlen et al (2009: 9) concluded that workers experienced more work distress during night shifts and weekends.

Stress is not necessarily a bad concept (Teasdale 2006: 25) and thus managers need to deliberately impose a certain level of stress in order for employees to perform to an optimum level. It is also important to note that the relationship between the performance of workers and stress is explained by Wickens (2008: 450) as an inverted U relationship. He explained further that when stress is very low, worker performance will decrease and as stress rises, performance also increases. However, at a certain level stress grows to a degree high enough to impact negatively on the performance of the individual. It is natural that when there is too little pressure to perform work, too little effort is expended to engage with a particular task. Thus as the level of pressure increases within an individual, an optimum level of performance is then reached. If executing of pressure continues beyond this level, stress increases to an unbearable level.

### 2.3.2 Control

It is a natural desire for all human beings to demonstrate control over the work they perform. It is from this school of thought that both Blaauw et al (2013: 133) and Jones et al (2013: 50) agreed that reduced satisfaction can result from low levels of control over a person's work. The nature of radiography as a career does not allow space for much control over the radiographer's work. This is mainly due to the fact that patients are referred to radiographers by other health care personnel like doctors and physiotherapists. Lack of control has a negative impact on the performance

of personnel as it results in raised levels of occupational stress. Other disadvantages of the lack of control are frustration and anxiety (Rothmann 2007:2). In completing a multidisciplinary study of healthcare professionals on work stress and well-being in oncology settings, Jones et al (2013: 52) recommended that managers should consider and attend to the needs of all staff including support staff members that have low levels of control over their work. Autonomy and management styles are explained below.

#### 2.3.2.1 Autonomy

The degree to which employees are allowed to participate in their work schedule is important to their satisfaction with the work that they do (Allen et al 2008). Autonomy is a vital variable in any work environment and Verrier and Harvey (2010: 121) maintained that a lack of autonomy reduces job satisfaction and increases stress. Therefore in areas of radiography where scheduling is a norm (e.g. Computerised Tomography, Mammography, and Magnetic Resonance Imaging), radiographers should be given the mandate to control the booking systems.

Blaauw et al (2013: 134) explored the job satisfaction and intension to leave of different categories of health worker in Tanzania, Malawi and South Africa. South Africans were found to have the highest intention to leave and lowest job satisfaction. Those working in state hospitals were less content than those in private health institutions. Radiographers should be consulted before decisions affecting them are taken as lack of autonomy reduces job satisf-action (Verrier and Harvey 2010: 121).

#### 2.3.2.2 Management style

Autocratic and bureaucratic styles of management can increase levels of stress in employees and therefore managers should seek to become more demo-cratic. This can only be implemented without reserve if managers accept input from radiographers to be valuable (Verrier and Harvey 2010: 121). This includes involving all employees in the decision making processes

of the organisation (Iwu, Allen-lle and Ukpere 2012: 10500). In other words radiography managers should adopt an integrated leadership style. Advantages of this leadership style are enhanced satisfaction, reduced stress, improved employee connection with the organisation, sharing of knowledge, innovation, and motivation (Iwu, Allen-lle and Ukpere 2012: 10501, Jones et al 2013: 48). These authors went further in explaining that this kind of leadership can be achieved by organising and holding regular departmental meetings, workshops and social activities. In this management style, power is shared with subordinates and thus raising their level of inherent motivation.

### 2.3.3 Social support

Akroyd, Caison and Adams (2002: 220) described reassurance of worth as a credit of a person's skills by others including colleagues and supervisors. They further explained guidance as the presence of people who are in a position to provide knowledge, advice and expertise when needed. In radiography social support is usually expected to be provided by experienced and well skilled radiographers, radiologists as well as managers.

McNeely (2005: 293) stated that work place support from supervisors and colleagues can outweigh the burden of work demands. In addition, Jones et al (2013: 50) reported that co-worker support was linked to reduced effort, better reward and improved gratification. The manager's support is much more effective than the support provided by colleagues. A manager only needs to say a few words or act to a minimal extent and the effects on the worker will be greatest. Workers develop general views concerning the degree to which supervisors value their contributions and care about their well-being. Workers perceive supervisors as representatives of their organisation (Makanjee, Hartzer and Uys 2006: 124; Wallace et al 2009: 256).

Two South African studies found dissatisfaction of radiographers in relation to radiography managers. One study revealed that radiography managers failed

to communicate decisions to staff (Laurence, Poggenpoel and Myburgh 2011: 5, Makanjee, Hartzer and Uys 2006: 122). Radiography managers should always remember that intelligent leadership brings about respect for the individual and their direct needs, appreciation and support for individuals and their wellness, as well as inspiration and role modelling of effective behaviour (Teasdale 2006: 252).

A South African study (Gibson, Palmer and Shneider 2005: 1428) of 79 health clinics indicated that 68% of employees were stressed because they did not receive positive feedback from their managers. Outcomes such as provision of skills that assist employees to achieve work objectives (Wallace et al 2009: 258), reduced effects on perceived stress (Rutter and Lovegrove 2008: 140), stronger relationships between challenge stressors and performance (Wallace et al, 2009: 258), enhancement of employee's feeling of involve-ement (Backer, Albrecht and Leiter 2011: 20), better handling of managerial and extra jobs, evidence of less withdrawal behaviour (e.g. absenteeism and turnover), resistance to burnout, indication of superior performance and behaviour (Xanthopoulou et al 2012: 511). It must be remembered that happy workers are valuable assets of an organisation. Managers must therefore take every possible effort to improve happiness of workers at work. Staff evaluations should not only be used to identify areas in which radiographers are lacking but also those areas in which radiographers excel so as to motivate them where necessary.

The fact that some workers have to find a balance between their work and family responsibilities in order for them to be effective should not be ignored. Elloy and Smith (2003: 60) evaluated some stressors on dual-career and single-career couples and suggested that dual-career couples may have different needs from those of the more traditional single-career couples. The researchers of this study further state that managers should realise the need for a family friendly workplace. Managers and employees must change their perceptions in terms of adopting family friendly attitudes. The South African

labour movement has managed to persuade the government since 1994 to adopt policies and gazette laws whose intentions were to bring about a family friendly workplace. A good example of this is the paternity and family responsibility leave entrenched in the Basic Conditions of Employment Act (Act number 75 of 1997).

### 2.3.4 Role ambiguity

Role ambiguity is defined as a work situation in which there are inadequate pieces of information about how an individual is to perform a job (Ross and Altmaier 1994: 36; Tremblay and Roger 2004: 998). Elloy and Smith (2003: 58) further explained that role ambiguity relates to a reduced level of information about a certain role, which results in uncertainty about the expectations related to the role. In simple words, it is a measure of how uncertain one is about the duties expected of them. It must always be remembered that the more one experiences role ambiguity, the greater the individual experiences of stress (Beauchamp et al 2003: 79). This is clearly because role ambiguity is negatively linked to involvement and performance. Tremblay and Rogger (2007: 999) maintain that when an employee is unaware of the limits and scope of their performance, they hesitate to make decisions and therefore become less efficient. A number of studies have found role ambiguity to be one of the main causes of stress among radiographers (Rutter and Lovegrove 2008: 136, Ugwu, Erondu and Umeano 2011: 13). Staff shortages and lack of clear job descriptions may be the main causes of role ambiguity.

The clarity and clear understanding of job descriptions by both employers and employees results in less ambiguity about the performance of duties.This leads to reduced levels of stress (Marino 2005: 26). In addition, workers are always expected to render specific roles and thus should have clear and precise job descriptions (Mafuba 2012: 28). Marino explained further that clear job descriptions would be helpful in the allocation of work, creation of performance requirements, identification of career and progression pros-

pects, decision making on reorganisation of the job and methods of elevating work involvement.

Another critical area to avoid stress induced by role ambiguity is that radiographers must clearly understand their role in the radiography department and the entire hospital. Verrier and Harvey (2010: 120) alluded that when employees share the common vision of the organisation, they tend to enhance their commitment and thus reduce burnout. It is quite clear that when individuals understand the mandate and limitations of their organisation, they will own the mission and vision of the organisation and thus do what is best of them to deliver to the expectations of the clients of their organisation. It is therefore important that the mission and vision statements of the organisation and the unit be communicated to workers. In addition, if it is deemed necessary training must be conducted to ensure full support from workers. When this happens workers will be highly motivated and they will therefore deliver regardless of their perceived stressors.

### 2.3.5 Organisational change

An association between work-related stress (WRS) and organisational change has been observed (Mackay et al 2004: 98). Verrier and Harvey (2010: 121) explained that on a macro level, change may arise from political and organisational influences. On a micro level, organisational change can be due to the introduction of new technology e.g. installation of computed radiography (CR). Both levels of change will result in stress to the employee, and the manner in which these are managed will determine the magnitude of stress.

Radiographers need to be flexible and abreast with technological changes in order to cooperate with their managers who might introduce technological advances in their departments. To minimise stress to radiographers, managers must discuss the envisaged changes with their staff members prior to implementation (Romano 2012: 59). When installation of new equipment

units is planned, it would also be useful for managers to arrange for proper training on the equipment. It is usually necessary that some trainers are trained by the application specialist and these individuals would in turn train the rest of the staff members. All these measures are taken to reduce stress levels in radiographers.

Verrier and Harvey (2010: 122) reported that radiographers were not informed or consulted regarding issues of change in their workplace. The consequence of this finding was a high level of stress perceived to be caused by managers. Radiographers further reported that there was insufficient training and support when undergoing organisational changes. It was deduced from open ended responses that radiographers recommended that management should improve its management of stress issues resulting from organisational change. Radiographers also requested that they be provided with information, training and support relating to organisational changes.

## 2.4 Interventions to stressors

Effective reduction of stress in the workplace requires a concerted effort by both workers and organisations. Various authors have suggested a variety of methods and actions that can be undertaken by both workers and organisations and these are discussed below.

It is very rare to find employers being content about the service delivered by employees. Employees must therefore take steps to do something about the stressing conditions they find themselves in (Tennant 2001: 701). Lu et al (2010:2) revealed that active coping methods (e.g. social support) were more beneficial compared to passive coping methods like adaptation techniques. It should be noted that these coping behaviours do not remove the stressors but simply make it easier for the employee to work under the unforeseen circumstances. Individuals who provide social support are usually instrumental in giving both emotional and helpful support (Surana, Singh and Saxena 2011: 81). A number of authors (Rice 1999: 206, Teasdalle 2006:

253 and Wong 2008: 5) have suggested ways by which employees can reduce the levels of stress. These include identification of stressors, improvements in time management, soliciting social support, maintaining a healthy life style, management of workload, balancing between work and home responsibilities, self-awareness, ambition to learn and develop ethical values, emotional stability, engagement in good meaningful work beyond workplace and application of analytical methods during stress.

Henwood (1996: 116) suggests that job designs and roles should be reviewed and skill mix must be assessed to enhance available resources. It is important to reassess work patterns so as to ensure optimisation of departmental effectiveness (Verrier and Harvey 2010: 121). On the other hand, it is worth noting that transformations and continuous changes in healthcare delivery (particularly radiography) result in an increase in the complexity of cases, available treatment options, and patients that are more informed (Saha, Sinha and Bhavsar 2011: 1).

A number of studies (Akroyd, Caison and Adams 2002: 219, Allen et al 2008: 98, Elloy and Smith 2003: 60, Hasida and Keren 2008: 77, Henwood 1996: 115, Iwu, Allen-le and Ukpere 2012: 10490, Kawakami and Tsutsumi 2010: 2, Rajan 2012: 7, Ugwu, Erondu and Umeano 2011: 12, Verrier and Harvey 2010: 120 and Wallace et al 2009: 260) revealed that organisational support was highly significant in combating stressors in the work place. The above mentioned authors made the following recomme-ndations:

- employing more staff.
- review of work practices.
- regular feedback to radiographers.
- informing radiographers about available support.
- team building.

- introduction of policies to stop unfair labour practices.
- regular training of staff.
- proper planning and training prior to organisational changes.
- effective departmental appraisals for radiographers.
- clear job descriptions.
- monitoring of image quality by senior radiographers.
- provision of appropriate resources.
- organisation of time management workshops.
- improvement of remuneration.
- implementation of booking systems handled by radiographers.
- introduction of policies that encourage work-based support.
- introducing methods that enforce good work morale.

Among various actions to be taken in improving organisational support, both Mrara (2010: 37) and Verrier and Harvey (2010: 122) suggested that workers should be provided with training and development to enhance their careers. In addition, an individualised skill approach can improve perceived social support and decrease psychological distress in employees (Kawakami and Tsutsumi 2010: 2). Furthermore, there is a relationship between low levels of support from management and negative stress outcomes in radiographers. Therefore managers should also be provided with training in order to equip them with the necessary knowledge and skills to recognise patterns related to negative stress behaviour among their subordinates. It is also of vital importance that employees are informed about available forms of support during staff induction, and later on as such opportunities arise (Rajan 2012: 7).

## 2.5 Conclusion

Occupational stress remains a major challenge in radiographers and workers in other fields in South Africa and other parts of the world. It is quite clear that there is a variety of factors resulting in occupational stress amongst radiographers. However, this area has not been well researched amongst South African radiographers. On the other hand, literature has revealed that stress may have psychological, physical and behavioural consequences on an individual. Organisations may lose large amounts of their revenues due to stress related consequences. A number of research methods can be used to identify these stressors amongst radiographers. In addition, several strategies can be used to reduce occupational stress in radiographers.

The main causes of occupational stress such as demands, lack of control, insufficient social and manager's support, poor relationships, ambiguity of roles and poor management of organisational change have negative impact to both radiographer's health and service delivery. In reducing occupational stress amongst radiographers some methods can be implemented without extra costs to organisations whilst others may require healthcare centers to invest on them. Developing individual coping skills may be less costly for employers and radiographers but long lasting organisational improvements may produce long lasting results.

Research methods used to identify stress were predominantly quantitative in nature whilst some researchers have used qualitative research. It has become a logical practice to use a few open ended questions whilst employing mostly closed ended question and this is the case in the current study. The reverse of such methods have been used in qualitative studies. In most cases this was to establish profiles of respondents.

There is an urgent need to investigate stressors as well as methods of reducing them amongst radiographers in the eThekwini District of KwaZulu-Natal. It is envisaged that this study will be of benefit to radiographers,

supervisors, employers as well as patients. Radiography departments need to recognise occupational stress as a legitimate workplace challenge so as for them to initiate and participate in strategies and processes to combat occupational stress.

# CHAPTER 3

# METHODOLOGY

## 3.1 Introduction

This chapter describes all the aspects relating to the research method employed in executing this study. The research design, study location, population, inclusion and exclusion criteria, sampling techniques, the instrument, pilot study, data collection techniques and process, analysis of results and ethical considerations are described in detail. A summary is also presented at the end of this chapter.

## 3.2 Research design

A quantitative research approach was employed in order to elicit data regarding stress affecting radiographers (Ugwu et al, 2007: 124). A descriptive survey using a cross-sectional design was used to determine thoughts, feelings and actions of radiographers about occupational stress (Mitchell and Jolley, 2010: 212).

## 3.3 Study location

The data was collected in radiography departments in public health institutions within the eThekwini District of KwaZulu-Natal. Ten provincial hospitals and six community healthcare centers, all involved with diagnostic imaging were included. The majority (five) of these provincial hospitals are regional hospitals (see appendix 2). The six provincial hospitals and two community healthcare centers lacking radiography facilities were excluded from the study. The researcher was not able to gain access into all healthcare institutions and data was collected in one central hospital, three regional hospitals, one district hospital and two community health centers as indicated in table 1.

**Table 1: Study locations indicating number and percentage of respondents per healthcare center.**

| HEALTHCARE CENTER | LEVEL OF HEALTHCARE CENTER | NUMBER OF RESPONDENTS (%) |
|---|---|---|
| King Edward VIII Hospital | Central | 3 (6.98) |
| Addington Hospital | Regional | 8 (18.6) |
| Prince Mshiyeni Memorial Hospital | Regional | 11 (25.58) |
| RK Khan Hospital | Regional | 12 (27.91) |
| Wentworth Hospital | District | 7 (16.28) |
| Inanda Primary Healthcare Center | Primary Healthcare Center | 1 (2.33) |
| Phoenix | Primary Healthcare Center | 1 (2.33) |
| Total | | 43 (100) |

### 3.4 Population

Qualified radiographers employed in diagnostic radiography departments in public health facilities within the eThekwini District of KwaZulu-Natal were invited to participate in the study. Specific inclusion and exclusion criteria were set as follows to delineate the population:

#### 3.4.1 Inclusion criteria

- Qualified diagnostic radiographers working in public health institutions in the eThekwini District.
- All participants must have completed community service by 31 December 2013 so as to maximise garnering of data based on professional exposure and expertise.

- Participants had to be registered as independent practitioners with the HPCSA so as to ensure that all participants had a minimum of one year of experience.

### 3.4.2 Exclusion criteria

Student radiographers and Community Service radiographers were excluded from the study so as to rule out intrinsic stress due to insufficient experience and expertise. Radiography managers and supervisors were also excluded from participating in this study.

## 3.5 Sampling

There were 156 diagnostic radiographers employed in public health institutions in the eThekwini District at the time when the study was conducted. In addition, a stratified sampling strategy was used to ensure that radiographers from as many levels of healthcare centers as possible were represented in the study (Polgar and Thomas 2013: 37). Radiographers were selected from three regional hospitals, one district hospital, two central hospitals, and three radiographers were from two Community Health Centers. All diagnostic radiographers meeting the inclusion criteria from within the selected institutions were invited to participate in the study. A sample size of 101, which constituted 65% of the total population of diagnostic radiographers (n = 156) in public health facilities within the eThekwini District was drawn.

## 3.6 Instruments

A questionnaire (Appendix B) was used to collect data. The questionnaire used in this study was an adapted version of the one used in the study by Verrier and Harvey (2010). The questionnaire has been widely used in the UK and studies have proved it to have acceptable validity and reliability and its factor structure has been empirically supported (Edwards et al 2008: 105). The questionnaire was adapted to include demographic data (items 1 to 10), statements 35 to 38 as well as 50 to 65. Some statements were included to elicit information on methods currently used by employers to reduce stress in

the workplace. This questionnaire was designed by the Health and Safety Executive (HSE) in the United Kingdom (UK) where six management standards were identified for work related stress (WRS). The questionnaire was initially designed to assess application of the standards in various workplaces. The questionnaire consists of seven constructs (demands, control, manager's support, peer support, relationships, role ambiguity, and organisational change) that represent potential stress hazards.

The demographic data elicited included age, gender, place of work, qualification, marital status, rank, distance from work and years of experience. Each statement in the next two sections was based upon a five-point Likert scale, with 27 statements measuring frequency (responses from Never to Always), and 24 statements gauging agreement (responses from Strongly Disagree to Strongly Agree). The purpose of these Likert scale statements was to elicit occupational stressors as well as methods currently used to reduce stress. Statements 62 to 65 were open ended used to elicit sources of stress, methods of managing stress currently used in radiography departments, recommendations for reducing work related stress (WRS) in the department, and reasons for radiographer turnover respectively.

### 3.6.1 Pilot study

A pilot study was conducted in one of the district hospitals within the eThekwini District in which four radiographers participated. This hospital was selected for a pre-test study because it was not included in the sampling. The pilot study was undertaken to identify difficulties in interpretation of questions and to measure the length of the questionnaire as well as ensuring a high standard of validity, accuracy, reliability, representativeness, objectivity, and ethical standards that should be inherent in the questionnaire.

## 3.7 Data collection procedure

Data collection commenced in February 2014 immediately after receiving permission from the KwaZulu-Natal department of health and public health

institutions within the eThekwini District. A pack comprising of the questionnaire (Appendix B), a letter of information (Appendix C) and a consent form (Appendix D) was hand delivered by the primary investigator. Delivery times were pre-arranged so as to avoid disrupting the work flow and improve the return rate of the questionnaires. Radiographers were recruited as groups or individuals depending on their availability at the time. A list of names of radiographers who expressed interest to participate in the study including their contact details was generated for purposes of reminding radiographers at a later stage. Respondents were requested to complete an informed consent and submit it with the questionnaire. Participants were reminded telephonically a week after the delivery of packs. A number of packs were given to the Radiography Managers to distribute to those radiographers who were not on duty on the day of questionnaire delivery so as to enhance the response rate. The questionnaires were collected by the investigator and were stored in a locked cabinet.

### 3.8 Analysis of results

Descriptive statistics using frequency and cross tabulations were used to reduce the data once all completed questionnaires were received. Analysis of data from closed ended questions was undertaken using version 21.0 of Statistical Package for Social Sciences (SPSS). The adequacy of statements measuring each of the seven constructs was measured using Cronbach's alpha. A reliability coefficient of 0,70 or higher was considered as acceptable whereas those between 0,4 and 0,6 were considered moderate with the lower referred to as weak.

In addition correlation of variables was performed using calculation of the Pearson's r where any figure above 0,7 was considered high; 0,3 to 0,6 to be moderate and less than 0,3 to be weak. To determine whether the differences in scoring patterns were significant, chi-square tests were done by variable. All of the significant values (p-values) that were less than 0.05 (the level of significance), implied that the distributions were not even,

meaning that the differences between the levels of seldom, sometimes and often were significant.

In analysing data from open ended questions, the transcripts data was coded based on similarities of words, concepts and themes. Transcripts were then transcribed into software form. Categories of themes were derived, allowing responses from statement 62 to be categorised into theme sources of stress; responses from statement 63 to be themed as methods of managing stress currently used in radiography departments; responses from statement 64 to be categorised into themed recommendations for reducing WRS in the department; and answers from statement 65 to be themed as reasons for radiographer turnover. Analysis of free response questions was performed by the use of content analysis. Quantification was used to condense the results, making them more easily understandable.

### 3.9 Ethical considerations

Ethical clearance was granted by the Durban University of Technology's Institutional Research Ethics Committee (Appendix E) and permission was requested (Appendix G) and received (Appendix F) from the KwaZulu-Natal Department of Health. A letter requesting support of the study was sent to the eThekwini District (Appendix H) and the support letter was in turn received (Appendix I). Another letter requesting permission to conduct the study was then sent to the manager of each healthcare facility (Appendices J to O) and some institutions granted verbal permissions whilst others issued letters of permission (Appendices P and Q).

A letter of information and consent form were given to each respondent, and once the consent form was signed it was kept under lock and key and only the researcher had access to it. A list of names of the respondents was kept only for the purposes of identifying those that have submitted their forms as well as reminding respondent about completion of questionnaires. This was destroyed by way of shredding once all the respondents in a particular venue

had submitted their questionnaires. Respondents were identified by the level and name of the healthcare facility they worked in. After reading the introductory letter and signing the consent form, which was on a separate page for easy detaching and safe-keeping, respondents completed a questionnaire. All the information was treated as confidential and respondent were provided with envelopes so that they could insert the questionnaires in them once the questionnaires were completed. Approval to present and publish research findings was requested from the respondents, so that publications and presentations can be done without further requests to the participants. Participants were ensured that the results of the study, including personal details regarding their demographics would be anonymously processed into a study report. In addition, participants as well as radiography managers at hospital, district and provincial levels will be given an opportunity to access the data.

### 3.10 Summary

A questionnaire was suitable for conducting this study as the study was to measure variables in a number of healthcare facilities within the eThekwini District. The original questionnaire was selected due to it recommended by previous researchers (Verrier and Harvey 2010: 121). In addition, the questionnaire underwent vigorous testing during its development stage (Cousins et al 2004: 128) and was found to be adequate in measuring the constructs studied in the current study.

# CHAPTER 4

# RESULTS

## 4.1 Introduction

This chapter presents the data in the form of figures, tables and narratives. The response rates and profile of respondents are the first parts to be presented. Causes of stress, methods of reducing stress as well as proposed methods of reducing stress are presented according to the research objectives. Causes of stress are presented using subheadings such as demands, control, manager's support, peer support, relationships, role ambiguity, organisational change. In addition, data obtained from open ended questions eliciting other causes of stress, other methods of reducing stress as well as proposed methods of reducing stress is also presented in the form of tables and narratives. Significant correlations between variables are also organised in the form of tables and narratives under each objective.

## 4.2 Response rate

In total, 101 questionnaires were administered and 43 were returned which resulted in a 42,6% response rate. All the returned questionnaires were completed fully with single answers selected for closed ended statements. All questionnaires were therefore found suitable for inclusion into data analysis.

## 4.3 Profile of respondents

The mean and standard deviation of the respondents' ages was 31,7 ± 9,5 years. The majority were between the age of 20 and less than 30 years (51,2%) and there were only two radiographers approaching retirement whilst just more than a quarter (25,6%) were between 30 and less than 40 years. About 19% were between the ages of 41 and 50 years. More than half of the respondents (58,1%) were not married and more than a third were married (34,9%). Of the remaining respondents, 4,7% were divorced and 2,3% were

widowed. Respondents were predominantly females (88,4%) and the majority of radiographers (67,4%) were in possession of a National Diploma in Radiography whilst the remainder held a Bachelor of Technology (B. Tech) qualification. A level one radiographer relates to a junior radiographer and a level three to the most senior radiographer. The majority (41,9%) of respondents were at grade three, 34,9% were at grade one and the remainning respondents were at grade two. Almost two thirds (65,1%) were performing general radiography.

Almost 88% of the respondents lived within 20 km of their place of work and the rest lived more than 20 km from work. The majority of respondents (25,6%) had between three and five years of experience whilst almost a fifth (18,6%) had between zero and two years of experience. Fourteen percent had between six and nine years and just over nine percent (9,3%) were qualified for between 16 and 20 years. Of the rest, 16,3% had 16 to 20 years and another 16,2% had 21 years and above of experience.

The majority of respondents (34,9%) had been working for their employers for between three and five years whilst 27,9% had been employed for between zero and two years. Fourteen percent had been in employment in their respective institutions for six to nine years whereas less than five percent (4,6%) were in their centers for 16 to 20 years. Close to a twelve percent (11,6%) of radiographers were working for their employers for ten to 15 years and 7% were employed by their healthcare centers for more than 20 years.

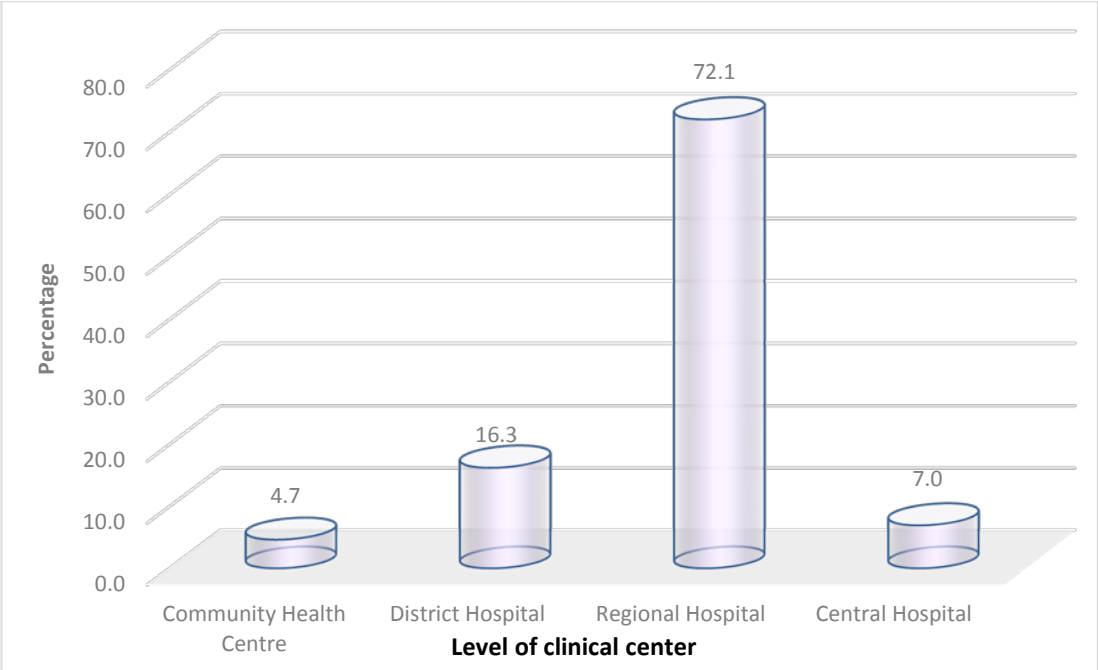


**Figure 1: Respondents per type of healthcare facility.**

As shown in figure 1, nearly three-quarters of the respondents worked at a regional hospital.

## 4.4 Objective 1: To determine the causes of occupational stress among radiographers

The causes of occupational stress in radiographers were investigated in relation to the factors that can influence occupational stress. These factors include demands, control, manager's support, peer support, relationships, role ambiguity and organisational change. For Likert scale statements measuring agreement, the respondents only selected disagree, neutral and agree. For those statements measuring frequency only often, sometimes and seldom were selected. Furthermore, responses from the open ended statement (statement 62) eliciting most stressors are presented towards the end of this section.

### 4.4.1 Demands

The reliability coefficient of the twelve items constituting the demands category was moderate (Cronbach's alpha = 0,644). As shown in Table 2 almost one fifth of the respondents often found it hard to manage demands from various people. A significant proportion of the respondents (74,4%) also agreed that they had to work very intensively ($p < 0,00$) and very fast ($p < 0,00$) more often than not. Nearly half of the respondents (48,8%) indicated that their shift duties added to their stress levels. More than one third of the respondents stated that some tasks had to be neglected due to them having too much work to do whilst a similar number of respondents indicated that they were satisfied with their jobs. Close to a third of respondents experienced unrealistic time pressures. The demands imposed by the need to supervise students significantly added to stress levels ($p < 0,00$).

**Table 2: Responses (%) to items related to demands.**

| Statement | Seldom (%) | Sometimes (%) | Often (%) | p value: |
|---|---|---|---|---|
| Different groups from work demand things from me that are hard to combine | 34,9 | 46,5 | 18,6 | 0,08 |
| I have unachievable deadlines | 51,2 | 39,5 | 9,3 | 0,00 |
| I have to work very intensively | 11,6 | 14,0 | 74,4 | 0,00 |
| I have to neglect some of my tasks because I have too much to do | 34,9 | 30,2 | 34,9 | 0,91 |
| I am unable to take sufficient breaks | 41,9 | 44,2 | 14,0 | 0,03 |
| I am pressured to work long hours | 44,2 | 32,6 | 23,3 | 0,24 |
| I have to work very fast | 9,3 | 27,9 | 62,8 | 0,00 |
| I have unrealistic time pressures | 37,2 | 30,2 | 32,6 | 0,85 |
| I am satisfied with my job | 27,9 | 37,2 | 34,9 | 0,74 |
| Students in training add to my stress | 62,8 | 27,9 | 9,3 | 0,00 |
| Students in training affect my ability to complete my work to my satisfaction | 58,1 | 27,9 | 14,0 | 0,00 |
| My shift duties add to my stress at work | 25,6 | 25,6 | 48,8 | 0,09 |

**p = differences in scoring patterns**

As indicated in Table 3, a significant proportion of radiographers (58%) who worked in regional hospitals often had to work very intensively (*p* = 0,00).

**Table 3: Responses to "I have to work very intensively" by type of healthcare facility.**

| Number of respondents by level of clinical centre | | | | | | |
|---|---|---|---|---|---|---|
| | | Community Health Centre n (%) | District Hospital n (%) | Regional Hospital n (%) | Central Hospital n (%) | Total (%) |
| I have to work very intensively | Seldom | 0 (0) | 4 (9,3) | 0 (0) | 1 (2,3) | 5 (11,6) |
| | Sometimes | 0 (0) | 0 (0) | 6 (14) | 0 (0) | 6 (14) |
| | Often | 2 (4,7) | 3 (7) | 25 (58,1) | 2 (4,7) | 32 (74,4) |
| | Total | 2 (4,7) | 7 (16,3) | 31 (72,0) | 3 (7,0) | 43 (100) |

The extent to which radiographers felt that the students were adding to their stress also varied according to the area that they were allocated to ($p$ = 0,04).

The majority of respondents agreed that when deadlines were unachievable they found it difficult to honour the various demands made on them ($r$ = 0,529, $p$ < 0,00). A proportion of respondents who felt that there were too many people making unreasonable demands on them also felt that they had to work very intensively ($r$ = 0,312, $p$ = 0,04). Those respondents who experienced difficulty in managing divergent demands were unable to take sufficient breaks ($r$ = 0,317, $p$ = 0,04). Respondents who were pressured by the mismatch between demands and available time compensated by working very intensively ($r$ = 0,364, $p$ = 0,02). Those who were unable to take enough breaks also had to neglect some of their tasks due to there being too many tasks to be completed ($r$ = 0,456, $p$ = 0.00). Respondents who worked longer shifts were less satisfied with their jobs ($r$ = -0,315, $p$ = 0,04) and the satisfaction of radiographers with their jobs was inversely related to how fast they had to work ($r$ = -0,358, $p$ = 0,02).

### 4.4.2 Control

The reliability coefficient ($\alpha$ = 0,588) for the seven statements measuring control was moderate. It is observed from Figure 2 that the levels of responses ranged between 9,3% and 53,5%. The scores for “often” were significantly higher for the statements relating to freedom of radiographers to express themselves with regards to their own work speed ($p$= 0,03). Respondents had a say over how they worked ($p$ = 0,01). Responses regarding punctuality were almost evenly distributed ($p$ = 0,91). A significant proportion of the respondents (48,9%) reported that they had a say in their own work speed. More than 50% of radiographers agreed that they had a say over the way they worked whilst 14% disagreed.

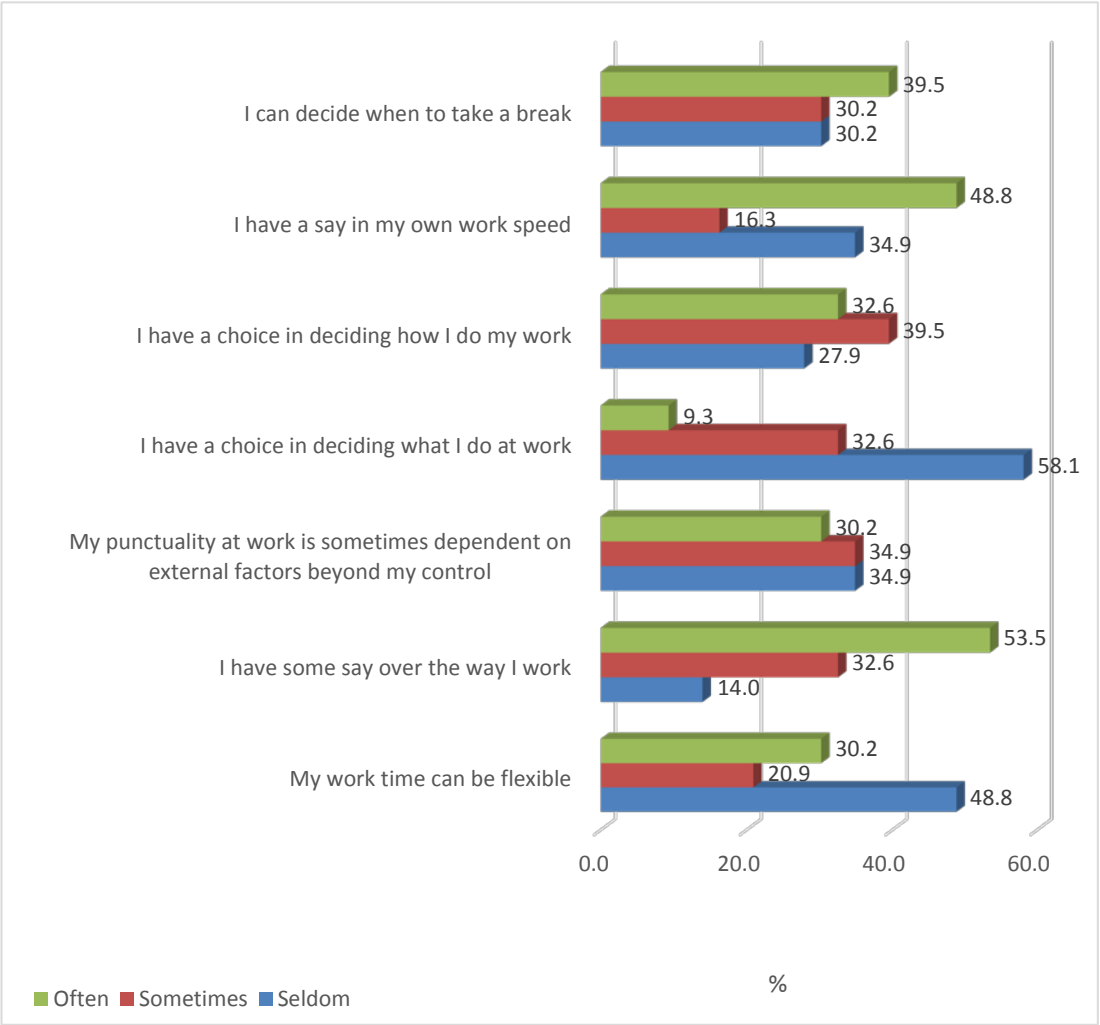


**Figure 2: Responses (%) to items related to control.**

There was also a significant association between the choice by radiographers to decide how they did their work and years of service in their respective clinical centers ($p$ = 0,03). Almost a fifth of radiographers who had been working for their clinical centers for between zero and two years seldom had a choice in deciding what they did at work.

### 4.4.3 Manager's Support

There was a high reliability coefficient ($\alpha$ = 0,824) for the eight statements measuring this construct. As shown in Table 4, the majority of respondents reported that they did not have time for personal growth, could not take sufficient days of leave and could talk to their manager about anything that

upset or annoyed them. There was a moderate inversely proportional relationship between the respondent's opportunities for personal growth and stress induced by shift duties ($r$ = -0,508, $p$ = 0,00).

**Table 4: Responses (%) to items related to manager's support.**

| Statement | Disagree (%) | Neutral (%) | Agree (%) | p value: differences in scoring patterns |
|---|---|---|---|---|
| I am given supportive feedback on the work I do. | 32,6 | 41,9 | 25,6 | 0,42 |
| I can rely on my line manager to help me out with a problem. | 30,2 | 27,9 | 41,9 | 0,86 |
| I have opportunities for personal growth. | 37,2 | 39,5 | 23,3 | 0,37 |
| I have time for personal growth. | 60,5 | 16,3 | 23,3 | 0,00 |
| I am allowed to take time off work when personal emergencies occur. | 23, 3 | 32,6 | 44,2 | 0,24 |
| I can talk to my line manager about something that has upset or annoyed me about work. | 25,6 | 25,6 | 48,8 | 0,09 |
| My line manager encourages me at work. | 37,2 | 25,6 | 37,2 | 0,56 |
| I am able to take a sufficient number of leave days. | 25,6 | 14,0 | 60,5 | 0,00 |

Respondents who could take time off to respond to personal emergencies felt that they had a say in their work speed ($r$ = 0,437, $p$ = 0,00) as well as in deciding on how to go about doing their jobs ($r$ = 0,399, $p$ = 0,01). The respondents felt that when they received less favourable feedback, their shift duties became more strenuous ($r$ = -0,323, $p$ = 0,03). There was a moderate direct relationship between encouragement received from the manager at work and job satisfaction of radiographers ($r$ = 0,448, $p$ = 0,00). However, a weak positive correlation was noted between the encouragement received from managers and radiographers having a say in their own work speed ($r$ = 0,377, $p$ = 0,01). A significant relationship was also noted between the ability

of radiographers to take a sufficient number of leave days and their distance from a clinical center ($p$ = 0.00).

### 4.4.4 Peer Support

The Cronbach's alpha for this construct was 0.611 and four out of five statements in this category of variables had significant responses for "often" ($p <$ 0,00). As indicated in figure 3, the scores for these statements ranged between 58,1% and 65,1%.

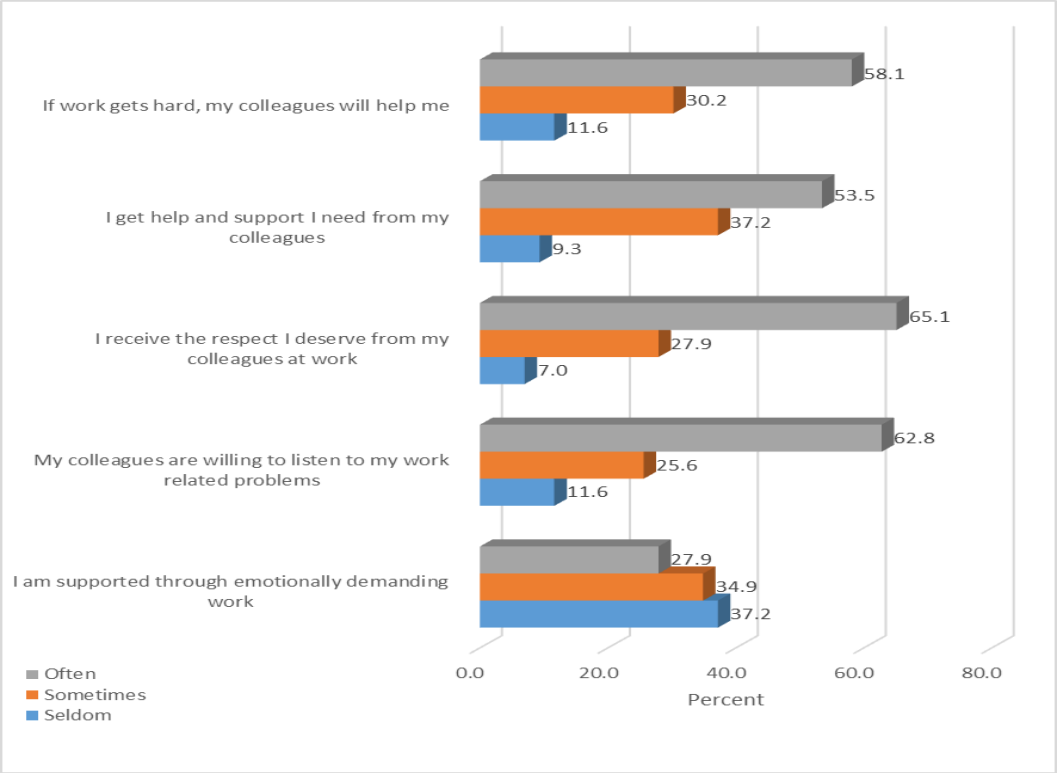


**Figure 3: Responses (%) to items related to peer support.**

There was a weak inversely proportional relationship ($r$ = -0,307, $p$ < 0,05) between the eagerness of colleagues to help when work got hard and unachievable deadlines. Respondents also felt that the more they received help from colleagues the less they would feel pressure from working long hours ($r$ = -0,350, $p$ < 0,01). A moderate directly proportional relationship between "When work gets hard my colleagues will help me" and "I have a

say in my own work speed" ($r$ = 0,408, $p$ < 0,05) was noted. The more the radiographers received respect from their colleagues, the less they had to neglect their tasks.

Table 5 indicates that there were weak significant positive and negative relationships between certain responses pertaining to peer support and some variables. However a significant positive directly proportional relationship ($r$ = 0,529, $p$ < 0,01) was noted between the ability to manage divergent demands and the ability to achieve deadlines. Another significant positive directly proportional relationship ($r$ = 0,621, $p$ = 0,00) was observed between the clarity of respondents about the outcome of their work changes and consultation of staff about changes at work.

**Table 5: Correlations with statements relating to peer support.**

| **Statement** | **Pearson's r.(p value)** | **Correlating statement/s** |
|---|---|---|
| Ability to manage divergent demands. | 0,312 (0,04) | work very intensively. |
| | 0,317 (0,04) | unable to take sufficient breaks. |
| Mismatch between demands and available time. | 0,364 (0,02) | working very intensively. |
| We were consulted about changes in the department. | 0,392 (0,009) | Had a say over the work they did. |
| Clarity of respondents about the outcome of their work changes. | 0,321 (0,036) | I am clear about the goals and objectives for my department. |
| | 0,325 (0,034) | I understand how my work fits into the overall aims of the hospital. |

On the other hand, a weak negative relationship was noted between job satisfaction and working long hours as well as between clarity of respondents about the outcomes of their work changes and friction and anger between radiographers. Table 6 shows that qualification did not negatively affect the respect that the respondents obtained from their colleagues at work. This is

concluded because 39,6% of respondents with ND: Radiography often received respect from their colleagues and 25,6% of those with BTech in radiography often received respect from colleagues.

**Table 6: A Correlation of responses regarding receiving respect from colleagues and highest qualification obtained.**

| | | Highest Qualification | | |
|---|---|---|---|---|
| | | ND: Radiography n (%) | BTech: Radiography n (%) | Total n (%) |
| I receive the respect I deserve from my colleagues at work | Seldom | 2 (4,7) | 1 (2,3) | 3 (7,0) |
| | Sometimes | 10 (23,3) | 2 (4,7) | 12 (27,9) |
| | Often | 17 (39,5) | 11 (25,6) | 28 (65,1) |
| | Total | 29 (67,4) | 14 (32,5) | 43(100,0) |

### 4.4.5 Relationships

The reliability coefficient (Cronbach's alpha= 0,521) for the four items in this section was moderate. Figure 4 illustrates that a large number of respondents (58,1%) reported that they were seldom subjected to personal harassment in the form of unkind words or behaviour. Close to three quarters (74,4%) felt that they were seldom exposed to bullying at work. Nine percent of the respondents indicated that they were often harassed or bullied at work, Twenty six percent reported that relationships at work were often strained. About a quarter of the respondents felt that there was often friction or anger amongst colleagues at work.

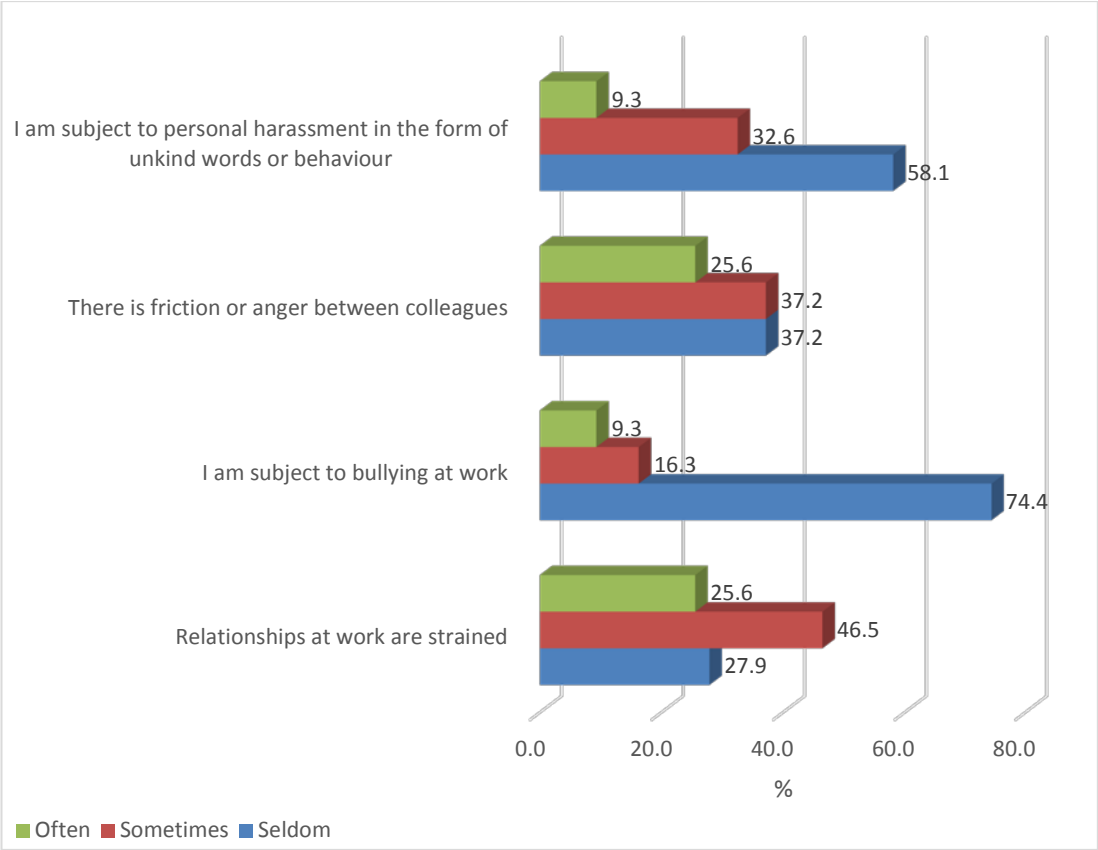


**Figure 4: Responses (%) to items related to relationships.**

Table 7 indicates that responses to questions relating to personal harassment and bullying were quite significant ($p < 0,01$).

**Table 7: Relationship between scoring patterns**

| **Statement** | **p value: differences in scoring patterns** |
|---|---|
| I am subject to personal harassment in the form of unkind words or behaviour. | 0,00 |
| There is friction or anger between colleagues. | 0,56 |
| I am subject to bullying at work. | 0,00 |
| Relationships at work are strained. | 0,18 |

There was a weak direct relationship ($r = 0,383$, $p < 0,05$) between personal harassment in the form of unkind words and unachievable deadlines. When radiographers were subjected to personal harassment, they also had to

neglect some of their tasks due to high workload and vice versa ($r$ = 0,052, $p$ < 0,05). The same group of respondents who experienced personal harassment also felt that they experienced unrealistic time pressures. Friction and anger amongst respondents also resulted in respondents having to neglect some tasks ($r$ = 0,338; $p$ < 0,01). Respondents were also unable to take sufficient breaks ($r$ = 0,373, $p$ < 0,01). The relationship between friction or anger between colleagues and job satisfaction was moderately inversely proportional ($r$ = -0,521, $p$ < 0,01). The relationship between bu**l**lying at work and the feeling of being pressurised to work long hours was a moderate positive one ($r$ = 0,401, $p$ < 0,05). The responses for “Relationships at work are strained” were directly proportional to “Different groups from work demand things from me that are hard to combine”. As can be seen in Table 8,47% of respondents between the ages of 20 and 30 years reported that they seldom experienced bullying at work.

The respondents stated that when there was friction between colleagues, the punctuality of radiographers depended on factors outside their control ($r$ = 0,325, $p$ < 0,01). There was an inversely proportional relationship ($r$ = -0,373, $p$ < 0,01) between anger amongst colleagues and freedom of radiographers to comment over the way they worked.

**Table 8: Relationship between "I am subject to bullying at work: and Age in years**

| Age in years | | | | | | |
|---|---|---|---|---|---|---|
| | | 20 - < 30 n (%) | 30 - < 40 n (%) | 40 - < 50 n (%) | 50-< 60 n (%) | Total n (%) |
| I am subject to bullying at work. | Seldom | 20(46,5) | 5 (11,6) | 6 (14,0) | 1(2,3) | 32 (74,4) |
| | Sometimes | 1 (2,3) | 5(11,6) | 0 (0,0) | 1 (2,3) | 7 (16,3) |
| | Often | 1 (2,3) | 1 (2,3) | 2 (4,7) | 0 (0,0) | 4 (9,3) |
| | Total n (%) | 22 (51,2) | 11(25,6) | 8 (18,6) | 2 (4,7) | 43 (100,0) |

### 4.4.6 Role Ambiguity

As illustrated in Table 9, 74,4% to 97,7% of the respondents responded positively to all statements in this category of role ambiguity ($p < 0,00$).

**Table 9: Responses for role ambiguity (in % form) with *p*-values.**

| **Responses** | **Seldom (%)** | **Sometimes (%)** | **Often (%)** | ***p*-value** |
|---|---|---|---|---|
| I am clear about what is expected of me from work. | 2,3 | 20,9 | 76,7 | < 0,00 |
| I know how to go about getting my job done. | 0,0 | 2,3 | 97,7 | < 0,00 |
| I am clear about what my duties and responsibilities are. | 0,0 | 11,6 | 88,4 | < 0,00 |
| I am clear about the goals and objectives for my department. | 4,7 | 20,9 | 74,4 | < 0,00 |
| I understand how my work fits into the overall aims of the hospital. | 0,0 | 18,6 | 81,4 | < 0,00 |

A large number (58,1%) of respondents were clear about their internal locus of control as shown in the statement on role ambiguity in which all affirmative responses were significant. The affirmative responses were independent of the grade of the respondents (grade 1: 27,9%; grade 2: 18,6%; grade 3: 27,9%).

When respondents were clear about the goals and objectives of their departments, they also had: fewer unachievable deadlines ($r$ = -0,314, $p$ < 0,01); less pressure to work long hours ($r$ = 0,425, $p$ < 0,01); more say in their work speed ($r$ = 0,319, $p$ < 0,01); more say over the way they worked ($r$ = 0,469, $p$ < 0,01); control over factors influencing their punctuality ($r$ = 0,380, $p$ < 0,01); increased flexibility of work time ($r$ = 0,379, $p$ < 0,01) .
Responses regarding how their work fitted into the overall aims of the hospital, correlated with: reduced pressure in working long hours ($r$ = -0,411, $p$ < 0.01); did not have to work very fast ($r$ = -0,361, $p$ < 0,01); time pressures were reasonable ($r$ = -0,312, $p$ < 0,01); clearer about the goals of their departments ($r$ = 0,532, p < 0,01); bullying at work was reduced ($r$ = -0,372, $p$ < 0,01); able to take enough leave days ($r$ = 0,389, $p$ < 0,01); colleagues could help when work got hard ($r$ = 0,328, $p$ < 0,01); permitted to take time off to respond to personal emergencies ($r$ = 0,411, $p$ < 0,01); work times were flexible ($r$ = 0,324, $p$ < 0,01); had a say over the way they worked ($r$ = 0,479, $p$ < 0,01); had control over their punctuality at work ($r$ = -0,394, $p$ < 0,01); had a choice in deciding how they did their jobs ($r$ = 0,338, $p$ < 0,01); had a say in their own work speed ($r$ = 0,532, $p$ < 0,01).

### 4.4.7 Organisational Change

The reliability coefficient for this construct with three statements was high (Cronbach's Alpha was 0,758). The distribution of responses across the choices was almost even ($p$ > 0,05). More than three quarters of the respondents agreed that staff were consulted about changes in their work place, In addition close to two fifths agreed that when changes were made, they were clear about how changes would work out in practice.


**Figure 5: Responses (%) to items related to Organisational Change.**

Respondents indicated that when they were consulted about changes in their departments they: felt like their work was not too intense ($r$ = -0,386, $p$ = 0,01); felt as if they did not have to work very fast ($r$ = -0,497, $p$ = 0,00); Shift duties did not add to their stress ($r$ = -0,481, $p$ = 0,00); had a say in their own work speed ($r$ = 0,331, $p$ = 0,03); had a choice in deciding how to do their work ($r$ = 0,360, $p$ = 0,02); had a say over the work they did ($r$ = 0,392, $p$ = 0,01); had a flexible work time ($r$ = 0,471, $p$ = 0,00); line managers could help them with their challenges ($r$ = 0,441, $p$ = 0,00); felt like there were opportunities for personal growth ($r$ = 0,302, $p$ = 0,05); could take time off work to respond to personal emergencies ($r$ = 0,445, $p$ = 0,00); had encouraging line managers ($r$ = 0,366, $p$ = 0,02); Were supported when there was emotionally demanding work ($r$ = 0,382, $p$ = 0,01) ;Were clearer about their departmental goals and objectives ($r$ = 0,355, $p$ = 0,02), Understood how their work contributed in advancing overall institutional aims ($r$ = 0,349,

$p$ = 0,02) and could question managers regarding work changes ($r$ = 0,346, $p$ = 0,02).

More correlation coefficients between responses regarding the opportunity of respondents to question their managers about changes in their respective departments and other related statements are presented in Table 10.

**Table 10: Correlations between the opportunity of radiographers to question their managers regarding work changes and other statements.**

| Statement | Pearson's correlation coefficient (r). | Correlating Statements |
|---|---|---|
| I have sufficient opportunity to question managers about changes at work. | $r$ = -0,432, $p$ = 0,00 | Shift duties add to my stress. |
| | $r$ = 0,303, $p$ = 0,05 | I have some say over the way I work. |
| | $r$ = 0,400, $p$ = 0,01 | Work time can be flexible. |
| | $r$ = 0,361, $p$ = 0,02 | I am given supportive feedback on the work I do. |
| | $r$ = 0,457, $p$ = 0,00 | I can rely on my line manager to help me. out with a problem. |
| | $r$ = 0,310, $p$ = 0,04 | I have opportunities for personal growth. |
| | $r$ = 0,516, $p$ < 0,00 | I can talk to my line manager about something that has upset or annoyed me about work. |
| | $r$ = 0,423, $p$ = 0,01 | My line manager encourages me at work. |
| | $r$ = 0,307, $p$ = 0,05 | If work gets hard, my colleagues will help me. |
| | $r$ = 0,332, $p$ = 0,03 | My colleagues are willing to listen to my work related problems. |
| | $r$ = 0,580, $p$ < 0,00 | I am supported through emotionally demanding work. |

### 4.4.8 Other Causes of Stress

Regarding statement 62 respondents had to list three main sources of stress experienced in their workplaces and 136 responses were received. The three other main sources of stress in order of response rate were workload, faulty equipment and staff shortages (Table 11). In addition to stressors recorded in Table 11, respondents also complained about non compensation of overtime, uncooperative patients, short breaks, irresponsibly staff and performance of old cases after hours.

**Table 11: Frequency of responses regarding other stressors.**

| **Stressor** | **Frequency in %** |
|---|---|
| Workload | 19,1 |
| Unnecessary requests | 7,4 |
| Staff shortages | 12,5 |
| Faulty equipment | 16,9 |
| Miscommunication | 2,2 |
| Poor management skills | 3,7 |
| Lack and inadequacy of supplies | 1,5 |
| Absenteeism from work | 3,7 |
| Long working hours/ shifts | 3,7 |
| Staff attitude e.g. punctuality, professionalism, tidiness/cleanliness | 1,5 |
| Very fast work pace | 1,5 |
| Lack of career progression | 2,9 |
| Incompetent staff members | 1,5 |
| Rude doctors and patients | 1,5 |
| Work strategies / patterns | 1,5) |
| Staff conflicts | 5 (3,7) |
| High staff turnover | 3 (2,2) |
| Lack of assistance after hours | 2 (1,5) |
| Lack of cooperation from support | 3 (2,2) |
| Lazy colleagues | 2 (1,5) |
| Lack of disciplinary actions. | 2 (1,5) |
| Demanding doctors | 2 (1,5 |

Sources of stress illustrated in Table 11 were further grouped into themes that were ambiguous enough to include a number of stressors and the theme sources of stress developed were demands, poor management skills, social support, staff attitudes, and control.

## 4.5 Objective 2: To determine the methods currently used to reduce occupational stress in diagnostic radiographers.

Responses received from the seven Likert scale items are provided in Table 12. In addition respondents were requested to state other methods used by employers to alleviate stress in their departments and responses are presented towards the end of this section. Two thirds of the respondents disagreed that employers had stress reducing strategies in place but more than half agreed that an Employee Assistance Programme (EAP) was in place. Almost half of the respondents maintained good physical health through exercise and just more than a half were engaged in creative activities outside their work places.

**Table 12: Responses for methods of reducing stress (%) with p-values.**

| **Responses** | **Disagree (%)** | **Neutral (%)** | **Agree (%)** | ***p*-value :scoring patterns** |
|---|---|---|---|---|
| My employer provides methods to alleviate stress. | 65,1 | 27,9 | 7,0 | 0,00 |
| There is gym facilities provided. | 65,1 | 20,9 | 14,0 | 0,00 |
| There is an Employee Assistance Programme in place. | 25,6 | 20,9 | 53,5 | 0,02 |
| The EAP meets the specific requirements of radiographers. | 41,9 | 34,9 | 23,3 | 0,32 |
| I maintain good physical health through positive nutritional programme. | 20,9 | 34,9 | 44,2 | 0,17 |
| I maintain good physical health through exercise. | 20,9 | 30,2 | 48,8 | 0,07 |
| I am engaged in creative activities outside work place. | 30,2 | 18,6 | 51,2 | 0,03 |

There was an association between the provision of methods to alleviate stress by the employer and years of experience as a qualified radiographer ($p$ = 0,02). A large number of respondents (65%) disagreed with the statement that their employers provided methods to alleviate their stress. On the other hand, more than a quarter of radiographers in the age group between 20 and 30 years and all those between 40 and 50 years (18,6%) agreed that there was an EAP in place. The rank of the radiographer ($p$ = 0,02) and the type of clinical facility in which they were employed ($p$ = 0,03) had an effect on their ability to maintain good physical health through a nutritional programme. More than a third of radiographers employed in regional hospitals agreed that they used a nutritious diet to maintain their health.

Correlation coefficients of variables further proved that when the employer provided methods to alleviate stress, respondents did not have to work very intensively ($r$ = -0,364, $p$ = 0,02) nor did they neglect some of their duties due to them having too much to do ($r$ = -0,382, $p$ = 0,01). Provision of methods of reducing stress also resulted in less pressure for working long hours ($r$ = -0,345, $p$ = 0,023) and work speed was reasonable ($r$ = 0,401, $p$ = 0,01). Time pressure on radiographers was also found to be reasonable (r = 0,366, $p$ = 0,02). Provision of stress calming methods also brought about reduced friction amongst colleagues ($r$ = -0,425, $p$ = 0,00) as well as less personal harassment in the form of unkind words ($r$ = -0,436, $p$ = 0,00).

When the employer provided methods to alleviate stress, employees were satisfied and had a say in their work speed (Table 13). There was also a positive correlation between provision of stress reducing methods by the employer and employees having time for personal growth.

**Table 13: Correlation of responses regarding "My employer provides methods to alleviate stress" and related statements.**

| Statement | Pearson's r.(p value) | Correlating statement/s |
|---|---|---|
| My employer provides methods to alleviate stress. | 0,401 (0,008) | I am satisfied with my job. |
| | 0,366 (0,016). | I have a say in my own work speed. |
| | 0,347 (0,023). | I am given supportive feedback on the work I do. |
| | 0,369 (0,015). | I can rely on my line manager to help me out with a problem. |
| | 0,400 (0,008). | I have time for personal growth. |
| | 0,423 (0,005). | I can talk to my line manager about something that has upset or annoyed me about work. |
| | 0,680 (0,00). | My line manager encourages me at work. |
| | 0,375 (0,013). | I get help and support I need from my colleagues. |
| | 0,520 (0,00). | I receive the respect I deserve from my colleagues at work. |
| | 0,477 (0,001). | I am supported through emotionally demanding work. |
| | 0,380 (0,012). | I have sufficient opportunity to question managers about changes at work. |

Table 14 illustrates the relationships between provision of gymnasium facilities, EAP and adequacy of the EAP. It can be noted that shift duties were less strenuous when the EAP met the specific needs of radiographers and vice versa.

**Table 14: Correlations of responses between variables measuring methods of reducing stress.**

| Variable | Pearson's correlation coefficient (r). | Correlating Statements. |
|---|---|---|
| There is gym facilities provided. | *r* =0,331, *p* = 0,030 | I can decide when to take a break. |
| | *r* = -0,305, *p* = 0,047 | I am clear about what my duties and responsibilities are. |
| There is an EAP in place. | *r* = 0,325, *p* = 0,033 | I have some say over the way I work. |
| | *r* = 0,302, *p* = 0,049 | I can rely on my line manager to help me out with a problem. |
| | *r* = 0,359, *p* = 0,018 | I am clear about the goals and objectives for my department. |
| | *r* = 0,383, *p* = 0,011 | I understand how my work fits into the overall aims of the hospital. |
| | *r* = 0,336, *p* = 0,028 | When changes are made at work, I am clear about how they will work out in practice. |
| The EAP meets the specific requirements of radiographers. | *r* = -0,363, *p* = 0,017 | My shift duties add to my stress at work. |
| | *r* = 0,345, *p* = 0,023 | I can rely on my line manager to help me out with a problem. |
| | *r* = 0,317, *p* = 0,038 | I have opportunities for personal growth. |
| | *r* = 0,459, *p* = 0,002 | I have time for personal growth. |
| | *r* = 0,364, *p* = 0,016 | When changes are made at work, I am clear about how they will work out in practice. |

All the correlations above are weak to bordering moderate but significant. Respondents also believed that the more they were involved in creative activities outside workplace the:

- Less they felt pressure in working long hours (*r* = -0,320, *p* = 0,04).
- More they had time for personal growth (*r* = 0,376, *p* = 0,01).
- More the colleagues were willing to listen to work related problems (*r* = 0,396, *p* = 0,01).

### 4.5.1 Other Methods of Reducing Stress

In statement 63 respondents were requested to state other methods currently used to reduce stress in the workplace. Table 15 illustrates responses obtained from this question. The frequencies at which they were cited are also shown and a total of 23 responses were received from all 43 respondents. A total of twelve methods were obtained from the responses to this question. Initiatives to reduce stress were either taken by the hospitals at large or departments and five respondents stated using physical exercises.

**Table 15: Responses in relation to methods currently used to reduce stress**

| Methods of coping with stress currently used | Frequency in % |
|---|---|
| Employee Assistance Programme (EAP) | 4,3 |
| Physiotherapy | 4,3 |
| Counselling | 13 |
| Hospital Wellness days | 13 |
| Physical exercises | 21,7 |
| Consultations with management | 4,3 |
| Team building | 13 |
| Managers answering patient queries | 4,3 |
| Swopping of shifts | 4,3 |
| Nurses assisting with critically ill patients | 4,3 |
| Weekly meetings | 8,7 |
| Ability to confide to one another | 4,3 |

Forty seven percent of respondents either did not answer the question or stated that they were not aware of any measures that were implemented to reduce stress in the work place.

## 4.6 Objective 3: To investigate methods that can be used to reduce occupational stressors in diagnostic radiographers.

Statement 64 requested respondents to state possible methods that could be used to reduce stress in their workplaces. Methods of reducing stress proposed by respondents are included in Table 16 including the frequencies at which they were suggested. Ninety four responses were received.

**Table 16: Responses in relation to proposed methods of reducing stress.**

| Proposed methods of coping with stress | Frequency in % |
|---|---|
| Change in management | 2,1 |
| Flexibility of working conditions and rosters. | 4,3 |
| Better equipment | 12,8 |
| More staff | 20,2 |
| More breaks (Night shift) | 2,1 |
| Teach radiation safety to doctors & Nurses | 2,1 |
| Team building exercises. | 9,6 |
| Better control of patients being referred to hospital. – Stick to referral system. | 3,2 |
| Improvement of tea room (Size, furniture | 2,1 |
| Provision of gym facilities | 2,1 |
| Reduce workload (by increasing overtime x2) | 5,3 |
| Making sure all staff members carry their weight. | 2,1 |
| Screen x-ray forms for unnecessary requests. | 2,1 |
| Consider CR /DR equipment | 4,3 |
| Management should be more understanding to staff and give them the respect and gratitude that they deserve. | 2,1 |

In addition to proposals suggested and reflected in Table 15 respondents also suggested streamlining of processes and review of protocols; increments in salaries; provision of in-service training; support by senior management; organisation of social events; improvement of communication between managers and employees, escorting of patients by nurses; provision of supplies; reduction in the number of ward examinations (Bed Side Units – BSU's) performed; ensuring effectiveness of all staff members; effective conflict resolution skills by managers; provision of proper restrooms; organisation and facilitation of stress management workshops and implementation of pre-employment medical examinations.

Forty four percent of radiographers suggested an increase in staff members whilst 28% suggested better equipment. The methods listed in Table 15 were further grouped into four themes of reducing stress in radiography departments and these included:

- Improving Management
- Reducing workload
- Improving equipment

### 4.7 Summary of Results

The average age of respondents was 31,7 years and the large majority of respondents were females (88,4%). The study revealed that most of the radiographers worked very intensively and in addition their shift duties added to stress. On the other hand, when deadlines were not met radiographers could not honour the demands made on them. More than a third of respondents had no say in their own work speed whilst only 20% of newly qualified (one to two years of experience) radiographers had a choice of deciding what they did at work. The majority of respondents had no time for personal growth and could also not take sufficient number of days of leave. All the constructs of stress investigated revealed that radiographers in the

public healthcare institutions in the eThekwini District were stressed by a variety of factors

The study also revealed that there was a moderate direct relationship between encouragement received from the manager at work and job satisfaction. Radiographers expressed that the more they received respect from their colleagues, the less they had to neglect their tasks. A low proportion of radiographers reported that there was often friction amongst colleagues at work. Open ended questions revealed further stressors which included demands, poor management, social support and staff attitudes.
About two thirds of the respondents did not agree that the employers offered methods of relieving stress whilst only half agreed that an Employee Assistance Programme was in place. Responses to open ended questions also revealed that physiotherapy; counselling and departmental meetings were used to alleviate stress.

Radiographers suggested improvement of management skills; reduction of workload; increment of staff; improvement of equipment and working conditions and career enhancement strategies as methods that could be used to reduce stress amongst them.

# CHAPTER 5

# DISCUSSION

## 5.1 Introduction

This chapter discusses the findings of the study as presented in chapter four. A quick discussion of the response rate is presented followed by a discussion on radiographer stressors. Causes, current methods of reducing stress as well as proposed methods of reducing stress are discussed with relevance to the study objectives. The fourth objective (to determine whether there are any significant differences between the variables producing occupational stress in radiographers) is addressed under each stressor. The chapter ends with a discussion on the three main causes of stress expressed by the respondents in response to an open ended question which is followed by the chapter summary.

## 5.2 The response rate

The response rate of 42,6% was found to be much lower than the acceptable norm of 60% (Polit and Hungler 1994: 177) and 59% proposed by Akroyd, Caison and Adams (2002: 220). This lower response rate was attributed to the research policy that is in place in one of the central hospitals within the eThekwini District which resulted in the researcher being unable to undertake the study amongst radiographers in that facility. However the response rate was almost similar to 45,2% recorded by Daugherty (2002: 310) in a study of sonographers.

Respondents were predominantly females (88,4%) and this is aligned to the gender profile of South African radiographers. Previous studies amongst South African radiographers have confirmed a higher proportion of females compared to males. Laurence, Poggenpoel and Myburgh (2011: 5) conducted a qualitative study and reported a sample size of four males and

nine females. This can also be compared to the seven males and 112 females in the quantitative study performed by Makanjee (2006: 121). The working experience of radiographers was found to be acceptable as almost a third have been working for sixteen years and above. In addition, it is always reassuring for junior employees to see that there are employees with adequate experience that they can rely on for guidance and support. In contrast, there was a small number of respondents that have been employed in their current hospitals for more than sixteen years.

One of the weaknesses of the current study was the uneven distribution of respondents in terms of their type of workplace. A large number of respondents (72%) worked in regional hospitals. The main reason for this was that access to one of the central hospitals which employed about thirty four radiographers could not be obtained. This resulted in the imbalance observed. However, only seven radiographers working in the other central hospital participated in the study. It can also be argued that the majority of hospitals in the eThekwini District are regional and therefore the views and opinions of radiographers that participated in the current study may to a certain extent represent the views and experiences of radiographers in this district.

## 5.3. Objective 1: To determine the causes of occupational stress among diagnostic radiographers.

Causes of stress were classified according to demands, control, manager's support, peer support, role ambiguity, organisational change, and other causes elicited from open-ended questions. All these categories are discussed below. Based on the Cronbach's alpha the tool used was adequate to examine the constructs in this study. Organisational support had very few statements but had a reasonable high Cronbach's alpha. This indicate that the statements used were highly adequate to examine this construct.

The sections on control and relationships had lower Cronbach's alpha scores. Amongst the reasons for this was that the section on relationships had a small number of items. However the respondents were given an option to express themselves by using open ended statements to address all ills prevailing in their departments.

### 5.3.1. Demands

High workload was identified as the major stressor in radiographers working in the eThekwini District. When respondents were requested to state three main sources of stress in their department, 26 of them mentioned workload. This was noted to be a trend in most radiography departments throughout the world (Daugherty 2002: 310, Kubik-Huch et al 2010: 380, Ugwu, Ahamefule and Nwobi 2008: 7, Verrier and Harvey 2010: 122).

The results suggested a high staff/patient ratio in the district. A significant number of respondents (n = 17) indicated staff shortages as a major stressor. This was however expected due to the high levels of workload as workload and staff numbers are usually inversely proportional to each other. This finding in the current study was not only unique to South African radiography departments as Akroyd, Caison and Adams (2002: 218) recorded a high staff patient ratio when investigating patterns of burnout amongst radiographers in

the United States. The correlation between this finding and other related findings from first world countries like America is an important one as it might be comforting for the radiographers in the eThekwini District to know that their circumstances are experienced by other radiographers elsewhere in the world. This should however not be interpreted in such a way that the researcher is recommending that nothing can be done about staff shortages. The respondents indicated that efficiency and effectiveness of their work was significantly compromised. Almost one fifth of the respondents often found it hard to manage demands from various people. The inability of radiographers to respond to demands from patients, doctors, nurses and other stakeholders in a healthcare setting can negatively affect patient care and service delivery.

A cross-sectional survey undertaken by Rothmann (2007:4) on South African hospital pharmacists revealed that job demands, pharmacy-specific stressors and a lack of resources were the major causes of stress. Other reasons for increased stress on personnel included service that is based on patient fulfilment (Ugwu et al 2007: 123), raised duties of healthcare workers and patient demands (Wu et al 2010: 161) and better informed patients (Saha, Sinha and Bhavsar 2011: 1). Unfortunately the respondents in the current study were not interviewed and therefore reasons (and sources) for increased demands could not be established.

The current study suggests that when there is a high patient to staff ratio, staff tend to work faster and more intensely to compensate for the staff shortages and high workload. A significant proportion of the respondents agreed that they had to work very intensively (74,4%) and very fast (62,8%) more often than not. These results were similar to those of a UK study amongst radiotherapists conducted by French (2004: 20) which found large volumes of patients to be adding to stress. Reasons for working intensively and fast as exposed in the current study could be caused by a number of factors and some have been confirmed in this study. These include

equipment faults and high workload coupled with severe staff shortages. Furthermore, the current study suggested that when radiographers experience too many demands they felt that they were working too fast and very intensively.

Respondents in the current study found shift duties to be a challenge. Nearly half of the respondents indicated that their shift duties added to their stress levels. This finding was expected because it was noted that a number of radiographers were working unacceptably long hours of night duty. Long working hours have been documented by some of the stress connoisseurs (Backe`et al 2012: 70, Wainwright and Calnan 2002: 24,) to be a major stressor among employees.

Ross and Altmaier (1994: 42) state that the prevalence of organising a working day into three different shifts has increased since the First World War. In addition the South African legislation (labour Relations Act, Act number 66 of 1995 and Basic Conditions of Employment Act, Act 85 of 1997), enforce that an employee should not work more than twelve consecutive hours at a time. Furthermore, working shifts in addition to the usual 08:00 am to 16:00 pm shift is another factor that may result in occupational stress. Radiography has responded to the demand for services by introducing shift work. Rajan (2012: 7) investigated the relationship between job stress and general health among radiographers in Tamil Nadu, and reported that shift work is a stressor.

### 5.3.2 Control

The results suggested that the autonomy of radiographers that participated in the current study was moderately low indicating that radiographers had average control over the circumstances involving their work. These results were however not surprising as most of the radiographers (65,1%) performed general radiography and thus have no control over the numbers and

conditions of patients presenting to them. These findings were similar to those of Kumar, Moro and Narayan (2004: 37) in which the respondents felt they were unable to control their work pace. The current study indicated that almost 50% of the participants could control their work speed whilst Kumar, Moro and Narayan (2004: 31) observed that only 39% of the respondents had control over their work pace.

Another stressor observed in this study was caused by the inability of radiographers to decide on break times. Almost two thirds of the respondents had the freedom to decide on when to take a break. Arnold (1997: 95) found that younger respondents had less control compared to their older counterparts and the low control indicated in this study could be influenced by the relatively young age of the respondents (Mean = 31,7). In contrast with the current study. Kumar, Moro and Narayan (2004: 31) found that more than 78% of the radiographers participating in their study could take breaks as scheduled.

It was found to be stressing for radiographers that they did not know which radiographic task was to be performed next. Only about nine percent of the respondents in the current study could decide what to do at work. These findings were similar to those of Polworth (1981: 100) who found radiographers to be stressed by their inability to know which tasks would be performed on the next patient. Young and inexperienced radiographers may therefore find these circumstances to be stressful and this could result in their dissatisfaction with the job (Tennant 2001: 699). On the other hand, radiographers participating in the study by Kumar, Moro and Narayan (2004: 32) revealed that trauma and emergency, general radiography, and ward (mobile) radiography were ranked to be the most difficult areas to work in. The reasons for high levels of stress when working in these areas of the department could result from the fact that patients in these areas are usually not booked and may present as emergency cases.

### 5.3.3 Manager's Support

Manager's support contributes to reassurance of worth and builds confidence in an individual. The current study revealed that the majority of respondents were unable to take time for personal growth and take sufficient days of leave. In addition, respondents could not talk to their managers about anything that annoyed them. These negative results could have been due to the autocratic styles of management within the eThekwini District. However, the most likely cause could be the shortage of radiographers and high levels of workload expressed earlier on. Whatever the reason could have been, these findings were certainly not in favour of a good working atmosphere and thus could have resulted in high levels of stress in radiographers.

Similar to the findings of Verrier and Harvey (2010: 121), the current study indicates a positive correlation between low levels of manager's support and factors negatively affecting radiographers. Amongst these was stress induced by shift duties. As previously pointed out, radiographers in some of the departments within the eThekwini District worked unacceptable long shifts.

Respondents who could take time off to respond to personal emergencies were more confident in rendering their duties. When managers are considerate of the worker's situations, the workers will perceive supervisors to provide positive support (Makanjee 2006: 124). In this study those employees who could take time off to respond to their emergencies felt that they had a say in their work speed as well as in deciding on how to go about doing their jobs. Radiography managers should always remember that innovative leadership brings about respect for the individual and their direct needs, appreciation and support for individuals and their wellness, as well as inspiration and role modelling of effective behaviour (Teasdale 2006: 252). When employees receive positive attitudes and behaviours from their

managers, the employees will also develop positive behaviours about their organisations.

Giving positive feedback to employees provides numerous benefits to both the manager and the organisation at large. The respondents in the current study felt that when they received less favourable feedback, their shift duties became more strenuous. This gives evidence to the belief that giving positive feedback to employees enhances their motivation and ability to think positively about their work. In addition to this, a South African study (Gibson, Palmer, Palmer and Schneider 2005: 1428) in 79 health clinics indicated that 68% of employees were stressed because they did not receive positive feedback from their managers. Staff evaluations should not only be used to identify areas in which radiographers are falling short but also those areas in which radiographers excel so as to motivate them where necessary.

The current study showed that there could be a moderate direct relationship between encouragement received from the manager at work and job satisfaction of radiographers. The commitment of managers to the welfare of their employees determines the employee satisfaction (Hutton et al 2014: 2). Radiography managers should adopt an inclusive leadership style so as to ensure that all members of staff are involved in decision making processes. Advantages of this leadership style are enhanced satisfaction, reduced stress, improved employee connection with the organisation, sharing of knowledge, innovation, and motivation (Iwu, Allen-lle and Ukpere 2012: 10501 and Jones et al 2013: 49). Managers need to make efforts to recognise good performance and use those observations to encourage radiographers. Encouragement can be applied using simple words such as thank you; well done; good; excellent and so forth. Use of kind words to staff members can enhance their performance quite significantly. It is however quite disturbing to note that there were only 16 respondents that reported encouragement from their managers.

Responses from open ended statements revealed areas that were not adequately dealt with by managers. Five respondents expressed high levels of absenteeism whilst another five found poor staff attitudes (e.g. punctuality and dress codes) to be stressful. Rude doctors, staff conflicts, irresponsibly and lazy staff were also some of the stressors mentioned by the respondents. These findings were similar to those of the study conducted by Rajan (2012:7) in Tamilnadu. Managers should be well trained to deal with these issues as inability to manage these factors may result to hire stress levels in radiography departments.

### 5.3.4 Peer Support

The findings of the current research indicated that the support amongst radiographers was fairly acceptable. Close to two thirds of the respondents expressed that they often received assistance from colleagues when work got difficult. The results of the current study are different to those of a study by French (2004: 18) which revealed lack of support amongst colleagues. McNeely (2005: 293) stated that work place support from supervisors and colleagues can outweigh the burden of work demands. In addition, Jones et al (2013: 49) reported that co-worker support was linked to reduced effort, better reward and improved gratification. The manager's support is much more effective than the support provided by colleagues. When employees do not get assistance from their colleagues, they tend to experience high stress levels and thus become unable to complete their tasks. The current study revealed a moderate proportional relationship between lack of eagerness by colleagues to assist when work gets difficult and inability of radiographers to complete their task.

In addition, there was a directly proportional relationship between the respect received by radiographers from their colleagues and neglecting of tasks by radiographers. The more the radiographers received respect from their colleagues, the less likely they would neglect their tasks. Respect by

colleagues is considered an integral component of promoting cooperation, peace and harmony amongst staff members. In addition respect by colleagues results in encouragement and enthusiasm thus productive personnel. The results of this study are in keeping with findings by Rutter and Lovegrove (2008: 141) which revealed that when stress levels were high due to other factors, peer support would help in reducing the perceived effects of stress. It is therefore very vital that radiographers support each other during the delivering of their duties. This study, however, found better levels of peer support when compared to the study conducted by Verrier and Harvey (2010: 121).

### 5.3.5 Relationships

Only four statements were used to measure this construct and this could have resulted in the moderate Cronbach's alpha recorded. The moderate reliability coefficient could also be as a result of inadequacy of the statements in measuring this construct.

Bullying and ill treatments have been reported in this study. A large number of respondents (Figure 4) reported that they were seldom subjected to personal harassment in the form of unkind words or behaviour. Close to three quarters felt that they were seldom exposed to bullying at work. Unfortunately there was no further prompting with regards to the exact sources of such treatment. The most likely sources of bullying and ill treatment in radiographers could be colleagues (for example lazy and rude staff members); doctors (for example reaction of radiologists when work is perceived to be inadequate, reactions of surgeons during an operation, demanding physicians etc.), nurses and other members of the healthcare team (e.g. refusal to assist when working with difficult patients), patients and members of the public as well as managers. It should also be noted that good relationships among staff in the workplace might have more influence than the job itself (Nakata et al 2004: 1728).

Bullying is a form of workplace violence (Beech and Leather 2006: 28) and as such employees and managers should take every effort to eradicate it from their departments. The findings of this study are also in keeping with the results of the study by Chang and Lu (2009: 599) which revealed that poor relationships between civil servants and others were a major cause of stress. Verrier and Harvey (2010:122) observed that high stress levels were likely to trigger bullying among radiographers.

The results of the current study suggest a directly proportional relationship between experiences of personal harassment and unrealistic time pressure. These findings are supported by a number of studies that have discovered that personal harassments can be predictors of stress, burnout and depression (Cho et al 2008: 53, Tennant 2001: 700 and Yeboah et al 2014: 148). Besides bullying discussed above, radiographers can experience personal harassment from other radiographers. A study conducted in Ghana that examined determinants of workplace stress in healthcare workers found that relationships with co-workers, physicians and other departments could cause occupational stress (Yeboah et al 2014: 145). Though in South Africa morbid rivalry amongst employees may result in poor communication and reduced morale, this is unlikely to be the case in radiographers due to severe staff shortages.

### 5.3.6 Role Ambiguity

Seventy four percent to 97,7% of the respondents responded positively to all statements examining this construct. This is an indication that radiographers within the eThekwini District were clear about what was expected of them at work. This is a very important finding as it is highly important that each employee be provided with a clear and simple job description (Mafuba 2012: 28). Clear understanding of job descriptions by both employers and employees results in less ambiguity about the performance of duties and this leads to reduced levels of stress (Marino 2005: 27). The results of the current study suggest that the understanding by radiographers of the goals of the hospital has positive influences in other aspects of the radiographers functioning. Most of the respondents (81%) understood how their work fitted into the overall goals and objectives of the entire hospital.

### 5.3.7 Organisational Change

Consultation of staff prior, during and after any changes in their work environment is paramount to management of change. It should therefore be remembered that when radiographers are aware of the consequences and benefits of change, they are more likely to cooperate with proposed changes (Yu 2009: 24). It is good to note that more than 75% of respondents in the current study reported that they were consulted about changes in their work place. The benefits of the results of the current study are that when employees feel positive about organisational change, their trust, organisational identification and job participation improve (Yu 2009: 24).

The finding of the current study was contrary to that of Verrier and Harvey (2010: 122), who found that radiographers were not consulted with regards to changes in their departments. In addition to the benefits of consultation, respondents indicated that when they were consulted about changes in their departments they felt as if their work was not too intense, they did not have to work very fast; Shift duties did not add to their stress; they had a say in their

own work speed; they had a choice in deciding how to do their work; they had a say over the work they did; they had a flexible work time; and line managers could help them with their challenges. These correlations were low and significant but they would add value in the management of stress amongst the radiographers in the eThekwini District.

## 5.4. Objective 2: To determine the methods currently used to reduce occupational stress in diagnostic radiographers.

Methods of reducing stress currently used in radiography departments and various hospitals within the eThekwini District are discussed below. In addition, methods of reducing stress that were elicited from an open ended statement (statement 64) are also discussed in this section of the study.

An organisation should put in place methods that can be employed by the workers in reducing stress and these must be communicated to the employees. In this study there was a significant number of respondents who disagreed that employers had stress reducing strategies in place. Availability of stress reducing methods can be communicated to radiographers through regular staff meetings suggested by Kubik-Huch et al (2010: 383) and use of notice boards and during formal and informal counselling sessions. It should also be remembered that radiographers like most health care workers, do not regard themselves as recipients of healthcare services but rather as providers thereof (Raj 2006: 117). It is therefore possible that some of the radiographers could be turning a blind eye to these methods of reducing stress or some could be switching off when such methods are intimated as they do not think that they may need them.

However, an open ended question posed to radiographers revealed that the Employee Assistance Programme (EAP), Physiotherapy, Counselling, wellness days, management consultations, team building exercises, flexible shifts, weekly meetings, ability to confide to one another, assistance (by nurses) with critically ill patients and involvement of managers with patient

queries were the methods used to reduce stress in various healthcare centers within the eThekwini District. These methods have been reported in a number of studies (Govender, Mutunzi and Okonta 2012: 6, Probst and Griffiths 2009: 153, Rutter and Lovegrove 2008: 140) to be effective in reducing stress amongst employees.

A well-resourced structured EAP can provide access to a host of other methods that can be used to reduce stress amongst employees, and this study revealed that more than half of the respondents agreed that an EAP was in place. In addition another South African study by Makanjee, Hartzer and Uys (2006: 123) revealed similar findings and added that when radiographers perceive positive institutional support, their commitment to the organisation was significantly increased. A study investigating the effects of institutional support amongst the teachers in the Gauteng province of South Africa (Chinimona and Moloi 2014: 311) found that the support offered by the Department of Education was instrumental in enhancing organisational commitment, job gratification and level of employee performance. The eThekwini District of KwaZulu-Natal is to be commended for ensuring the provision of the EAP in most healthcare centers as reported by the respondents in this study, however steps need to be taken in ensuring that EAP facilities are offered in all healthcare institutions and their availability should be properly communicated to all staff members. Ensuring good quality services in EAP facilities would be another strong point though there were no questions to elicit such information in the current study.

Almost half of the respondents in the current study maintained good physical health through physical exercises. Physical exercise is quite an effective method of reducing stress (McDonald and Hodgdon 1991: 23) and is used by some radiographers in diminishing the negative effects of stress (Eslick and Raj 2002: 50). In a study conducted amongst South African doctors in the rural areas of the Limpopo province (Kotzee and Couper 2006: 13) doctors

suggested provision of recreational facilities. Radiographers should be educated about the importance and benefits of using this method as it requires motivation and eagerness. In addition to exercising, just more than 50% of the respondents were engaged in creative activities outside their work places.

Almost a fifth of the respondents with zero to two years of experience of revealed that they were not aware of the methods provided by the employer to alleviate their stress. A large number of radiographers (65%) disagreed with this statement. On the other hand, more than a quarter of the radiographers in the age group between 20 and 30 years and all those between 40 and 50 years (18.6%) agreed that there was an EAP in place. It is quite clear from these results that the newly employed radiographers were not informed about the available methods of reducing stress.

## 5.5 Objective 3: To determine methods that can be used to reduce occupational stressors in diagnostic radiographers.

There were no closed ended statements used to fulfil this objective. Instead an open ended question required radiographers to state methods that could be used to reduce stress in their workplaces. Forty four percent of radiographers suggested an increase in staff members whilst 28% suggested better equipment. A total of 37 methods of reducing stress were proposed by radiographers. These were then grouped into three themes which were:

- Improvement of Management
- Reducing workload
- Improving equipment

### 5.5.1 Improvement of Management

Some of the respondents requested improvement in management and made a request for “change of manager”. This was a very harsh request and it could mean that these radiographers experience extreme stress. It is highly

likely that radiography managers are not complying with the findings of some of the studies including reassuring radiographers of their worth (Akroyed, Caison and Adams 2002: 221), providing support to radiographers (Ugwu, Ahamefule and Nwobi 2008: 28), mentoring and encouraging further studies by radiographers (Jasperse, Herst and Dungey 2013:6). Frustrating decisions may be taken especially when radiographers are not represented in decision making circles and decisions are taken without a basic understanding of radiography processes and procedures.

There was a request for "*Management should be more understanding to staff and give them the respect and gratitude that they deserve".* This is a clear indication of the probability that staff efforts are not being recognised and appreciated in some of the institutions. The statement also reflects a sense of bullying tactics used by managers and such attitudes by managers were found to be adding to stress (Gibbons 1998: 319).

Both of these claims are insignificant owing to low number of respondents that made them, however they are both quite serious and might result to ill health amongst the radiographers. It is therefore imperative that they be rooted out to ensure a safe workplace. There might be a need to train radiography managers in effective communication and other aspects of management. This finding is in keeping with that of Probst (2012: 763) which revealed that UK therapists reported increased levels of emotional exhaustion. This indicated that radiographers were of the view that their managers were lacking leadership qualities.

In support of the above, nine of the respondents called for team building exercises amongst radiographers. The results of the study by Verrier and Harvey (2010: 123) agreed with the current study as it found a lack of peer support to be a major stressor hence the call by the authors for promotion of team building exercises. Collaborative and team working is recommended in radiography departments due to the nature of radiography work.

Radiographers also need to look beyond just team building amongst themselves but with the entire healthcare team (including doctors, nurses, physiotherapists, porters, cleaners, clerical staff, darkroom operators etc.).

### 5.5.2 Reducing workload

High workload has been found to be a major stressor in most studies across healthcare workers (Chang and Lu 2009: 600, French 2004: 16 and Iwu et al 2012: 10500). Respondents in this study asked for strict referral systems to reduce the number of patients referred to their institutions. The request was made by individuals from the regional hospital and suggests that patient referral systems are not being adhered to. This could result in increased workload due to patients referring themselves to facilities that they perceive to be well equipped. Managers have a responsibility to monitor work levels in ensuring that workers are not overloaded or under loaded (Yeboah et al 2014:149). Other methods of reducing workload could be to introduce appointment systems where possible (Ugwu, Ahamefule and Nwobi 2008: 8), hire more radiographers (Probst and Griffiths 2008: 147, Rajan 2012: 8), and revision of work practices and protocols (Verrier and Harvey 2010: 121).

### 5.5.3 Improving equipment

Responses from the open ended questions also revealed a need to improve the state of equipment in radiography departments. Faulty equipment can be one of the greatest stressors in an x-ray department hence the proposal made by Makanjee, Hartzer and Uys (2006: 125) for radiography managers to ensure the existence of an effective quality control program. In addition to the quality control program, maintenance plan contracts should be in place to ensure speedy and efficient attention to equipment faults. These are particularly important for the eThekwini District as most of the hospitals in this district are training facilities and thus malfunctioning equipment also impacts negatively on the provision of training for radiography students. In addition equipment faults can result in staff turnover and one of the respondents in the current study stated that they had to leave their previous employer due to

broken equipment. Three of the respondents also called for Computed Radiography (CR) or Digital Radiography (DR) equipment to be put in place. However it was noted that most radiography departments had CR equipment installed and it is hoped that this initiative would be completed in all radiography facilities within the eThekwini District.

## 5.6 Summary

It is clear from this study that there is evidence of occupational stress among radiographers in the eThekwini District of KwaZulu-Natal. In keeping with literature, a number of factors have been found to be contributing to this finding. High workload was cited in this study to be the leading occupational stressor among radiographers and this requires urgent action as proposed in the next chapter. A range of methods used to reduce stress in radiographers in some hospitals is acceptable but will certainly need to be spread throughout the district.

# CHAPTER 6

# CONCLUSION AND RECOMMENDATIONS

## 6.1 Introduction

This chapter will provide conclusion, limitations of the study as well as recommendations.

## 6.2 Conclusion

The current study has revealed that public sector diagnostic radiographers working in the eThekwini District are stressed by a number of factors in their work places. High workload accompanied by low staff numbers, equipment faults, shift duties, radiography students and inadequate communication skills of radiography managers are some of the stressors. The consequences of these stressors have been the inability to take time to attend to personal emergencies, bullying at the work place, inability to take sufficient number of leave days and at times break times and many more.

These were exacerbated by the absence of Employee Assistance Programs and other methods of addressing stress in some institutions. It is however possible that EAP facilities are available but radiographers are not aware of their existence. Radiographers suggested various methods that could be used to reduce stress in their workplaces. These suggestions related to improvement of management, reducing workload and improving equipment.

## 6.3 Limitations and Future Studies

The generalizability of this study could be limited by the low response rate. The major contributing factor to this was that access into one of the central hospitals could not be obtained. The protocol used in this institution does unfortunately discourage any research activities to be undertaken within its

premises and staff. Another study with a larger sample size would be encouraged in the future.

Another limitation was that the study was only undertaken amongst the diagnostic radiographers in public health institutions. A future study including radiographers in all four disciplines of radiography in both public and private health institutions would be recommended. Some of the responses obtained needed some background and reasons for statements stated but such information was lacking due to the nature of the study. A study including a qualitative component would therefore be recommended for the future to afford radiographers a platform to express themselves more freely.

## 6.4 Recommendations

A number of stressors have been identified and solutions will require radiographers and employers to work hand in glove to find resolutions such as CPD activities and training of radiographers on interpersonal relations.

Though most of the stressors can be controlled by the organisation, there are a number of actions that will need to be taken by the radiographers themselves. Some of the solutions will require interventions by higher management structures like hospital managers, District managers and provincial authorities.

### 6.4.1 Recommendations to Radiographers

Radiographers should make use of physical exercises and a well-balanced diet to relieve stress. In addition, radiographers should take actions to empower / educate themselves about the new advances in equipment and techniques used in the field of radiography so that work would become less strenuous. Another advantage of this is that radiographers in training institutions will find it less frustrating to impart their knowledge and skills onto student radiographers and junior radiographers thus reducing stress levels.

On the other hand radiographers should make use of the opportunities made available by the employers to reduce stress in the work place. Workers must ensure that conflicts at personal level are resolved timeously and adequately

without spilling to the rest of the department. This can be achieved by organising conflict management workshops. Furthermore, radiographers are to take every possible step to ensure that all functions expected from each radiographer are carried out so that every individual fulfils their portion of the job. Lastly, radiographers should educate themselves about bullying and conduct themselves in a manner that is respectful and accommodative to others around them so as to demolish bullying in the workplaces.

### 6.4.2 Recommendations to Radiography managers and other managers at higher levels

Managers at all levels should be encouraged to enrol to register for management related qualifications. Some of the skills, knowledge and attitudes to be acquired during such programs may be communication skills, team building, and other stress coping mechanisms. It is very vital that team building initiatives be undertaken and radiographers be given opportunities to express themselves during such sessions. Weekly departmental meetings could be a good starting point for such initiatives and radiographers must be motivated to become a family away from home and in that way they will support each other.

Without properly functioning equipment there would be no service to be rendered by radiographers. It is therefore vital that equipment be serviced at all intervals as laid out by the national department of health's radiation control ambit. Effective regular quality control of all modalities ensures that faults are identified at an earlier stage without compromising services as these are usually scheduled for times when the departments are less occupied. Another advantage of this is to keep radiation dose at adequate levels as faulty equipment may results to x-ray tubes requiring use of high exposure factors. Maintenance contracts with equipment vendors are usually useful in this regard.

A three shift system should be implemented to ensure that radiographers work adequate number of hours without compromising their quality of life and production. The challenge of a two shift system currently used in most institutions is that one of the shifts is bound to be much longer than acceptable length of work hours. Radiographers should be engaged in deciding the nature and length of their shifts but parameters should be explained during such meetings to ensure compliance with legislation and reduction in interruption of services. In addition, managers should also ensure that all employees take reasonable breaks and leave so as to allow them time to attend to their own personal commitments.

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## Appendix A: classification of public healthcare centers offering radiography services in the eThekwini District

| HOSPITAL | LEVEL OF HEALTH CARE CENTER |
|---|---|
| Addington hospital | Regional Hospital |
| Clairwood hospital | Specialised Chronic Hospital |
| IALCH | Central Hospital |
| King Edward VIII hospital | Central Hospital |
| King Dinuzulu Hospital Complex | Regional Hospital |
| Mahatma Gandhi hospital | Regional Hospital |
| Osindisweni hospital | Medium District Hospital |
| Prince Mshiyeni hospital | Regional Hospital |
| RK Khan hospital | Regional Hospital |
| Wentworth hospital | Medium District Hospital |
| Cator Manor | Community Health Center |
| Inanda “C” | Community Health Center |
| KwaDabeka | Community Health Center |
| KwaMashu | Community Health Center |
| Phoenix | Community Health Center |
| Tongaat | Community Health Center |

## Appendix B: Questionnaire

DURBAN UNIVERSITY OF TECHNOLOGY

FACULTY OF HEALTH SCIENCES

Department of Radiography

TOPIC: OCCUPATIONAL STRESSORS IN DIAGNOSTIC RADIOGRAPHERS WORKING IN PUBLIC HEALTH FACILITIES IN THE ETHEKWINI DISTRICT OF KWAZULU-NATAL

RESEACHER: N. Gam Supervisor: Prof. T. Puckree & Co - supervisor: Mrs S. Naidoo

The purpose of this questionnaire is to gather information from radiographers in public health institutions within the EThekwini District regarding the factors that result to stress in their working environments as well as facilities for reduction of stress made available by employers and methods used by radiographers to reduce or prevent stress.

Your cooperation in completion of this questionnaire will assist in the advancement of the radiography profession and in my own personal development. Information stated in this questionnaire will be kept confidential and your participation will be valuable in my research findings.

The results of this survey or part thereof may be presented at a conference or be published in peer reviewed journal/s.

### SECTION A – DEMOGRAPHIC DATA

1. Age in years…….

   Please indicate your answers by placing a cross (X) in the appropriate box.

2. Gender:

| | |
|---|---|
| 1. | Male |
| 2. | Female |

3. Marital status:

| | | | |
|---|---|---|---|
| 1. | 2. | 3. | 4. |

| | | | |
|---|---|---|---|
| Single | Married | Divorced | Widowed |

4. Distance from residence to place of work:

| | | | | |
|---|---|---|---|---|
| 1.<br>0 – 5 Km | 2.<br>6 – 10 km | 3.<br>11 – 15 km | 4.<br>16 - 20 | 5.<br>Greater than 20 km |

5. Name of the hospital in which you are currently employed:…….

6. Highest level of qualification:

| | | | | |
|---|---|---|---|---|
| 1: National Diploma: Radiography | 2: BSc: Radiography | 3: BTech: Radiography | 4: Honours: Radiography | 5: Masters: Radiography |

7. Rank:

| | | |
|---|---|---|
| 1.<br>Level 1: Junior Radiographer | 2.<br>Level 2: Senior Radiographer | 3.<br>Level 3: Chief Radiographer |

8. Speciality area to which you are mostly allocated:

| | | | | | | |
|---|---|---|---|---|---|---|
| 1.<br>General | 2.<br>Ward & Theatre | 3.<br>Fluoroscopy | 4.<br>CT | 5.<br>MRI | 6.<br>Mammography | 7:<br>Trauma & Emergency |

9. Number of years of experience as a qualified radiographer:

| | | | | | |
|---|---|---|---|---|---|
| 1.<br>0 – 2 | 2.<br>3 – 5 | 3.<br>6 – 9 | 4.<br>10 – | 5.<br>16 – | 6.<br>20 |

| | | | | | |
|---|---|---|---|---|---|
| years | years | years | 15 years | 20 years | years and above |

10. Years of service at this hospital:

| | | | | | |
|---|---|---|---|---|---|
| 1.<br>0 – 2 years | 2.<br>3 – 5 years | 3.<br>6 – 9 years | 4.<br>10 – 15 years | 5.<br>16 – 20 years | 6.<br>20 years and above |

SECTION B - STRESSORS

Rate how you feel about work problems:

| In my department I feel that: | 1: Never | 2: Seldom | 3: Sometimes | 4: Often | 5. Always |
|---|---|---|---|---|---|
| 11. I am clear about what is expected of me at work. | | | | | |
| 12. I can decide when to take a break. | | | | | |
| 13. Different groups at work demand things from me that are hard to combine. | | | | | |
| 14. I know how to go about getting my job done. | | | | | |
| 15. I am subject to personal harassment in the form of unkind words or behaviour. | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| 16. I have unachievable deadlines. | | | | | |
| 17. If work gets difficult, my colleagues will help me. | | | | | |
| 18. I am given supportive feedback on the work I do. | | | | | |
| 19. I have to work very intensively. | | | | | |
| 20. I have a say in my own work speed. | | | | | |
| 21. I am clear about what my duties and responsibilities are. | | | | | |
| 22. I have to neglect some of my tasks because I have too much to do . | | | | | |
| 23. I am clear about the goals and objectives for my department. | | | | | |
| 24. There is friction or anger between colleagues. | | | | | |
| 25. I have a choice in deciding how I do my work. | | | | | |
| 26. I am unable to take sufficient breaks. | | | | | |
| | | | | | |

| At work: | 1: Never | 2: Seldom | 3: Sometimes | 4: Often | 5. Always |
|---|---|---|---|---|---|
| 27. I understand how my work fit into the overall aims of the hospital. | | | | | |
| 28. I am pressured to work long hours. | | | | | |
| 29. I have a choice in deciding what I do at work. | | | | | |
| 30. I have to work very fast. | | | | | |
| 31. I am subject to bullying at work. | | | | | |
| 32. I have unrealistic time pressures. | | | | | |
| 33. My punctuality at work is sometimes dependant on external factors beyond my control. | | | | | |
| 34. I can rely on my line manager to help me out with a work problem. | | | | | |
| 35. I have opportunities for personal growth. | | | | | |
| 36. I have time for personal growth. | | | | | |
| 37. I am allowed to take | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| time off work when personal emergencies occur. | | | | | |
| In my department I feel that: | 1.Strongly disagree | 2.Disagree | 3.Neutral | 4.Agree | 5.Strongly agree |
| 38. I get help and support I need from my colleagues. | | | | | |
| 39. I have some say over the way I work. | | | | | |
| 40. I have sufficient opportunities to question managers about changes at work. | | | | | |
| 41. I receive the respect I deserve from my colleagues at work. | | | | | |
| 42. Staff are always consulted about change at work. | | | | | |
| 43. I can talk to my line manager about something that has upset or annoyed me about work. | | | | | |
| 44. My work time can be flexible. | | | | | |
| 45. My colleagues are willing to listen to my work related problems. | | | | | |
| 46. When changes are made at work, I am clear about how they will work out inpractice. | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| 47. I am supported through emotionally demanding work. | | | | | |
| 48. Relationships at work are strained. | | | | | |
| 49. My line manager encourages me at work. | | | | | |
| 50. My employer provides methods to alleviate stress. | | | | | |
| 51. I am able to take sufficient number of leave days. | | | | | |
| 52. There is gym facilities provided. | | | | | |
| 53. There is an Employee Assistance Programme (EAP) in place. | | | | | |
| 54. The EAP meets the specific requirements of radiographers. | | | | | |
| 55. I maintain good physical health through positive nutritional programme. | | | | | |
| 56. I maintain good physical health through exercise. | | | | | |
| 57. I am engaged in creative activities outside work place. | | | | | |
| 58. I am satisfied with | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| my job. | | | | | |
| 59. Students in training add to my stress at work. | | | | | |
| 60. Students in training affect my ability to complete my work to my satisfaction. | | | | | |
| 61. My shift duties add to my stress at work. | | | | | |

62. List the three (3) main sources of stress in your department.

_____
_____
_____
_____
_____

63. What other methods of managing stress are used in your department or hospital.

_____
_____
_____
_____
_____
_____
_____
_____

64. What measures do you think can be used to reduce stress in your workplace?_____
_____
_____
_____

65.If you recently started working in your current workplace, state the reasons for leaving your previous employers:

_____
_____
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_____

Thanks for your valid input and time.

**Appendix C : Information letter**

Dear Colleague

**LETTER OF INFORMATION: OCCUPATIONAL STRESSORS IN DIAGNOSTIC RADIOGRAPHERS WORKING IN PUBLIC HEALTH FACILITIES IN THE ETHEKWINI DISTRICT OF KWAZULU-NATAL.**

**Principal Investigator/s/researcher:** Mr Nkululeko Phalson Gam, BTech: Radiography (D)

**Co-Investigator/s/supervisor/s:** Professor T. Puckree, PhD and Mrs S. Naidoo, Master's degree

**Brief Introduction and Purpose of the Study:**

Radiographers are currently experiencing a number of stressors that inhibit them from providing a high standard of service delivery and patient care. It is also quite a known fact that the number of practicing radiographers is insufficient to cope with the needs of the country. It is for this reason that the South African government has identified Radiography as one of the scarce skills.

This study investigates both the causes and the methods of reducing stress whilst it will also explore the methods currently used to manage stress in Radiography departments in the eThekwini District.

Therefore I need your assistance, as a participant, in this research study which is also a requirement for completion of master's degree in Radiography. **Please note that Community Service Radiographers may not participate in this study.**

**Outline of the Procedures**

If you agree to participate in this study, you will be required to sign the consent page and answer the attached questionnaire. This should take approximately 10 to 15 minutes to complete. The questionnaire will measure the causes of stress in diagnostic radiographers within the eThekwini District. It is important that you answer the questions as

openly and honestly as possible. Your questionnaire can only be scored if all the questions are answered so it is vital to answer all questions.

Once completed, the questionnaire and the signed consent page must be handed to the researcher no later than 15 February 2015. Should you wish to be informed of your scores and what they mean and or/ the results of this study, please supply me with your postal or e-mail address on the form provided.

**Risks or Discomforts to the Participant:**

There are no foreseeable risks or harm to you that will be imposed by the research study. The study involves completing the questionnaire about stress and demographic information. Some of the questions about your feelings and experience of work related situations may evoke emotions in you that may result to you feeling uncomfortable. You can choose at any time to withdraw from the study.

**Benefits:**

The results of this study will enable employers to implement intervention programs in diagnostic departments to help alleviate stress and improve emotional wellbeing of staff and service delivery. The researcher will benefit by obtaining a masters qualification and publishing in peer reviewed journals. The results will also be presented in conferences within South Africa and abroad.

**Reason/s why the Participant May Be Withdrawn from the Study**

You will not be advantaged or disadvantaged in any way should you choose to participate or not to participate in this study. A participant will be withdrawn from the study if they fail to sign and return the consent form or if any questions are left blank. If you decline to participate in this study, you may return the blank questionnaires. You may choose at any time to withdraw from the study as there is no

obligation to complete the study. Should you decide to withdraw from the study after the questionnaires are collected from your work place, please feel free to contact the researcher and your data will be returned to you or it will be destroyed at your request.

**Remuneration:**

You will not receive any monetary gift or remuneration of any kind for participation in this research study.

**Costs of the Study:**

You do not pay anything to participate in the study. The only cost for participating in this study is the time it will take you to complete the questionnaire.

**Confidentiality**

All information and data will be kept strictly confidential. All questionnaires are coded to facilitate recording but no names will be written on the questionnaires. The list of participant's names and their corresponding research number will be locked away in the filling cabinet with the researcher only having access to it. Questionnaires will be inserted into a locked suggestion box which will be situated within your department and only the researcher will hold the key to this box. Returned questionnaires will be kept in a fireproof locked filling cabinet with the researcher being the only person having access to it and will be scoring the participant's questionnaires. The consent page will be removed from the returned questionnaires and locked away in the filling cabinet to prevent linkage of the participants to their questionnaires. This will be done to maintain strict confidentiality. The data will be captured on spread sheets on the researcher's computer. The computer will be used solely for the purpose of this research and will be secured by password protection, , virus and spyware protection. Back up of data will be on a memory stick which will be

kept in a locked filling cabinet. The supervisor will only have access to the anonymous individual data on the researcher's computer and not the questionnaires and therefore will not be able to link the participant to their questionnaires. The research data, questionnaires and any other confidential information will be kept for five years thereafter it will be destroyed by the researcher with a shredder.

**Research-related Injury**

You will not incur any research related injury or adverse reaction in this study.

**Persons to Contact in the Event of Any Problems or Queries**

If you have any questions, concerns or problems at any time about the study or the procedures feel free to contact the researcher, Nkululeko Gam at 0737555563, or 031 3 (H), or 031 3732922 (W) or via email at nkululekog@dut.ac.za or my supervisor Prof L. Puckree at 031 373 2703. If you have any questions or concerns about ethical issues or your rights, or feel you have not been treated according to the descriptions in this form, or your rights as a participant in research have been violated during the course of this study, please feel free to contact the Institutional Research Ethics administrator on 031 373 2900. Complaints can be reported to the DVC: TIP, Prof F. Otieno on 031 373 2382 0r dvctip@dut.ac.za.

**General**

Your participation is completely voluntary and you will not be forced to participate. You are therefore under no obligations to participate. You may refuse to participate at any time during the study without penalty. Before you decide whether to accept this invitation to take part in this study please ask any questions that might come to mind. The approximate number of participants to be included in this study is 101. All participants will be issued with this information letter which does

not need to be returned to the researcher. The information letter and consent form will be in the primary spoken language of the research population, that is, English. Before signing the consent page, you must have had the opportunity to discuss your participation with the investigator and all your questions must have been answered in the terms you understand.

Thank you for taking the time to read this letter and if you are willing to participate thank you for your assistance in completing and returning the questionnaire. Your input will play a vital role in improving the quality of life for diagnostic radiographers and will thereby improve the quality of service delivery and patient care.

Warm Regards

N. Gam
Researcher

## Appendix D: CONSENT

**Statement of Agreement to Participate in the Research Study:**

I hereby confirm that I have been informed by the researcher, **Nkululeko Gam** about the nature, conduct, benefits and risks of this study - **Research Ethics Clearance Number: REC 78/13**. I have also received, read and understood the above written information (Participant Letter of Information) regarding the study.

I am aware that the results of the study, including personal details regarding my sex, age, date of birth, initials and diagnosis will be anonymously processed into a study report.

In view of the requirements of research, I agree that the data collected during this study can be processed in a computerised system by the researcher.

I may, at any stage, without prejudice, withdraw my consent and participation in the study.

I have had sufficient opportunity to ask questions and (of my own free will) declare myself prepared to participate in the study.

I understand that significant new findings developed during the course of this research which may relate to my participation will be made available to me.

_____ _____ _____ _____

**Full Name of Participant Date Time Signature / Right Thumbprint**

I, **Mr Nkululeko Gam** herewith confirm that the above participant has been fully informed about the nature, conduct and risks of the above study.

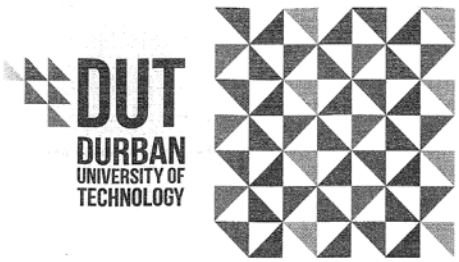
_____ _____ _____

**Full Name of Researcher Date Signature**

_____ _____ _____

**Full Name of Witness (If applicable) Date Signature**

## Appendix E: Letter of approval from Institutional Research Ethics Committee(DUT)



**Institutional Research Ethics Committee**
Faculty of Health Sciences
Room MS 49, Mansfield School Site
Gate 8, Ritson Campus
Durban University of Technology

P O Box 1334, Durban, South Africa, 4001

Tel: 031 373 2900
Fax: 031 373 2407
Email: lavishad@dut.ac.za
http://www.dut.ac.za/research/institutional_research_ethics

**www.dut.ac.za**

4 December 2013

IREC Reference Number: **REC 78/13**

Mr N P Gam
27 Brisbane Road
Umbilo
Durban
4001

Dear Mr Gam

**Work related psychosocial stressors in Diagnostic Radiographers working in public health facilities in the eThekwini District of KwaZulu-Natal**

I am pleased to inform you that Full Approval has been granted to your proposal REC 78/13.

The Proposal has been allocated the following Ethical Clearance number IREC 097/13. Please use this number in all communication with this office.

Approval has been granted for a period of one year, before the expiry of which you are required to apply for safety monitoring and annual recertification. Please use the Safety Monitoring and Annual Recertification Report form which can be found in the Standard Operating Procedures [SOP's] of the IREC. This form must be submitted to the IREC at least 3 months before the ethics approval for the study expires.

Any adverse events [serious or minor] which occur in connection with this study and/or which may alter its ethical consideration must be reported to the IREC according to the IREC SOP's. In addition, you will be responsible to ensure gatekeeper permission.

Please note that any deviations from the approved proposal require the approval of the IREC as outlined in the IREC SOP's.

**Please note that you may continue with validity testing and piloting of the questionnaire. Research on the proposed project may not proceed until IREC reviews and approves the final questionnaire. If there are no changes to the questionnaire kindly notify IREC in writing.**

Yours Sincerely

[redacted]

Prof J K Adam
Chairperson: IREC

## Appendix F: Permission letter from KwaZulu-Natal Department of Health

health
Department:
Health
PROVINCE OF KWAZULU-NATAL

Health Research & Knowledge Management sub-component
10 – 103 Natalia Building, 330 Langalibalele Street
Private Bag x9051
Pietermaritzburg
3200
Tel.: 033 – 3953189
Fax: 033 – 394 3782
Email.: hrkm@kznhealth.gov.za
www.kznhealth.gov.za

**Reference : HRKM 329/13**
**Enquiries : Mrs G Khumalo**
**Telephone : 033 – 395 3189**

Dear Mr NP Gam

**Subject: Approval of a Research Proposal**

1. The research proposal titled **'Work related psychosocial stressors in diagnostic radiographers working in public health facilities in the eThekwini district if KwaZulu Natal'** was reviewed by the KwaZulu-Natal Department of Health.

The proposal is hereby **approved** for research to be undertaken at Addington, Clairwood, Inkosi Albert Luthuli Central, King Edward VIII, King Dinuzulu Hospital Complex, Mahatma Gandhi Memorial, Osindisweni, Prince Mshiyeni Memorial, RK Khan and Wentworth Hospitals; Cato Manor, nanda, KwaDabeka, KwaMashu, Phoenix and Tongaat clinics

2. You are requested to take note of the following:
   a. Make the necessary arrangement with the identified facility before commencing with your research project
   b. Provide an interim progress report and final report (electronic and hard copies) when your research is complete.

3. Your final report must be posted to **HEALTH RESEARCH AND KNOWLEDGE MANAGEMENT, 10-102, PRIVATE BAG X9051, PIETERMARITZBURG, 3200** and e-mail an electronic copy to hrkm@kznhealth.gov.za

For any additional information please contact Mrs G Khumalo on 033-395 3189.

Yours Sincerely

[redacted]

**Chairperson, KwaZulu-Natal Health Research Committee**
**Date:** 24/07/2014.

**Appendix G: Letter of permission to KwaZulu-Natal Department of Health**


Health Research and Knowledge Management Component

Department of Health

Natalia Building

Room 102, South Tower

PIETERMARITZBURG

3200

Dear Dr Lutge

**REQUEST FOR PERMISSION TO CONDUCT RESEARCH**

I am currently registered as a master's student at the Durban University of Technology in the Department of Radiography within the Faculty of Health Sciences. I would like to embark on a research project towards a Masters degree in Radiography.

The proposed title of my study is Occupational Stressors in Diagnostic Radiographers Working in Public Health Centres in the eThekwini District of KwaZulu-Natal.

This is a quantitative descriptive study as it involves the use of structured questionnaires to collect data with regards to causes of stress in diagnostic radiographers; to identify work related factors contributing to stress and to identify the individual/ demographic

factors associated with stress in diagnostic radiographers. Following the analysis of data, strategies to manage or reduce stress in diagnostic radiographers will be suggested. I intend selecting at least 101 radiographers in the eThekwini District.

The study will not affect the normal work routine as the questionnaires will take approximately 10 minutes to complete which can be done during the radiographer‘s personal time at home or during lunch break at work. I plan to commence data collection in December 2013 and complete the entire research process by May 2014.

The executive dean of the Faculty of Health Sciences, Professor T. Puckree as well as Mrs S. Naidoo a senior lecturer and Head of Department of Radiography are supervising the study. The direct benefit from the study is that a summary of the research findings will be made available to the management of the employees. The long term benefits are that the research findings will be made available to formulate interventional programmes in diagnostic departments to help alleviate stress, improve the emotional wellbeing of staff and thereby improve their working life as well as improving service delivery for patients. Hence I strongly believe that this study will benefit both the patients and diagnostic radiographers.

The empirical evidence from this study will attempt to create awareness of the existence of stress or potential stress in order to improve service delivery. There will be no additional costs to the radiographer or the hospital.

The sample will be drawn from the public hospitals situated in this region. The institutions that will be eligible to take part in this study are Addington hospital, Clairewood hospital, Inkosi Albert Luthuli Central Hospital, King Edward VIII hospital, King Dinizulu Hospital Complex, Mahatma Gandhi hospital, Osindisweni hospital, Prince Mshiyeni hospital, R K Khan hospital, Wentworth hospital, Cato Manor Primary

Healthcare Center (PHC), Inanda PHC, KwaDabeka PHC, kwa Mashu PHC, Phoenix PHC and Tongaat PHC. All information will be treated in confidence and no reference will be made to a specific authority. Diagnostic radiographers will be classified by the level of the healthcare institution they work in.

My proposal has been reviewed by the Faculty of Health Sciences research committee and approved by the Institutional Research Ethics Committee at the Durban University of Technology.

Copies of my research proposal, support letter from eThekwini District and a letter of permission from the Institutional Research Ethics Committee of the Durban University of Technology have been attached for your perusal. Your support to perform this study will be greatly appreciated. Should you have any queries please do not hesitate to contact my supervisor Professor Puckree at 031 373 2703 or e-mail her at puckreet@dut.ac.za.

Many thanks for considering my request

Yours Sincerely

_____

Nkululeko Gam (Mr)

M.Tech Student at DUT

**Appendix H: Letter of permission to the eThekwini District**


Highway House

83 Jan Smuts Highway

Mayville

Durban

4001

Dear Ms. Hlazo

**REQUEST FOR SUPPORT LETTER: PERMISSION TO CONDUCT RESEARCH**

I am currently registered as a master's student at the Durban University of Technology in the Department of Radiography within the Faculty of Health Sciences. I would like to embark on a research project towards a Masters degree in Radiography.

The proposed title of my study is Occupational Stressors in Diagnostic Radiographers Working in Public Health Centres in the eThekwini District of KwaZulu-Natal.

This is a quantitative descriptive study as it involves the use of structured questionnaires to collect data with regards to causes of stress in diagnostic radiographers; to identify work related factors contributing to stress and to identify the individual/ demographic factors associated with stress in diagnostic radiographers. Following the analysis of data, strategies to manage or reduce stress in

diagnostic radiographers will be suggested. I intend selecting at least 101 radiographers in the eThekwini District.

The study will not affect the normal work routine as the questionnaires will take approximately 10 minutes to complete which can be done during the radiographer‘s personal time at home or during lunch break at work. I plan to commence data collection in December 2013 and complete the entire research process by May 2014.

The executive dean of the Faculty of Health Sciences, Professor T. Puckree as well as Mrs S. Naidoo a senior lecturer and Head of Department of Radiography are supervising the study. The direct benefit from the study is that a summary of the research findings will be made available to the management of the employees. The long term benefits are that the research findings will be made available to formulate interventional programmes in diagnostic departments to help alleviate stress, improve the emotional wellbeing of staff and thereby improve their working life as well as improving service delivery for patients. Hence I strongly believe that this study will benefit both the patients and diagnostic radiographers.

The empirical evidence from this study will attempt to create awareness of the existence of stress or potential stress in order to improve service delivery. There will be no additional costs to the radiographer or the hospital.

The sample will be drawn from the public hospitals situated in this region. The institutions that will be eligible to take part in this study are Addington hospital, Clairewood hospital, Inkosi Albert Luthuli Central Hospital, King Edward VIII hospital, King Dinizulu Hospital Complex, Mahatma Gandhi hospital, Osindisweni hospital, Prince Mshiyeni hospital, R K Khan hospital, Wentworth hospital, Cato Manor Primary Healthcare Center (PHC), Inanda PHC, KwaDabeka PHC, kwa Mashu PHC, Phoenix PHC and Tongaat PHC. All information will be treated

in confidence and no reference will be made to a specific authority. Diagnostic radiographers will be classified by the level of the healthcare institution they work in.

My proposal has been reviewed by the Faculty of Health Sciences research committee and approved by the Institutional Research Ethics Committee at the Durban University of Technology.

Copies of my research proposal and a letter of permission from the Institutional Research Ethics Committee of the Durban University of Technology have been attached for your perusal. Your support to perform this study will be greatly appreciated. Should you have any queries please do not hesitate to contact my supervisor Professor Puckree at 031 373 2703 or e-mail her at puckreet@dut.ac.za.

Many thanks for considering my request

Yours Sincerely

_____

Nkululeko Gam (Mr)

M.Tech Student at DUT

## Appendix I: Support letter from eThekwini Health District

health
Department:
Health
PROVINCE OF KWAZULU-NATAL

Postal Address: Private Bag X54318 Durban 4000
ss: 83 Jan Smuts Highway, Mayville, Durban 4091
Tel:031 2405308: Fax. 031 2405500
Email: nan.hoosain@kzn-health.gov.za
www.kznhealth.gov.za

Enquiries: Ms Jabu Hlazo
Tel: 031 240 5303
Date: 9 December 2013

Attention: Mr. N.P Gam

E-mail : nkululekop@dut.ac.za

**REQUEST TO CONDUCT RESEARCH:**

"Work related Psychosocial Stressors in Diagnostic Radiographers Working in Public Health Facilities in the eThekwini District of KwaZulu-Natal."

Support is hereby granted to conduct research on the above topic.

Please note the following:

1. Please ensure that you adhere to all the policies, procedures, protocols and guidelines of the Department of Health with regard to this research.
2. This research will only commence once this office has received confirmation from the Provincial Health Research Committee in the KZN Department of Health.
3. Please ensure that this office is informed before you commence your research.
4. The District Office will not provide any resources for this research
5. You will be expected to provide feedback on your findings to the District Office.

[redacted]

For: The District Manager
EThekwini Health District
Telephone: 031 2405303
Fax. 031 2405500
Email: jabulisiwe.hlazo@kznhealth.gov.za

**Appendix J: Letter of permission to Addington Hospital**


The Manager

Radiography Department

Addington Hospital

P O Box 977

DURBAN

4000

Dear Mrs Mfeka

**REQUEST FOR PERMISSION TO CONDUCT RESEARCH**

I am currently registered as a master's student at the Durban University of Technology in the Department of Radiography within the Faculty of Health Sciences. I would like to embark on a research project towards a Master's degree in Radiography.

The proposed title of my study is Occupational Stressors in Diagnostic Radiographers Working in Public Health Centres in the eThekwini District of KwaZulu-Natal.

This is a quantitative descriptive study as it involves the use of structured questionnaires to collect data with regards to causes of stress in diagnostic radiographers; to identify work related factors contributing to stress and to identify the individual/ demographic factors associated with stress in diagnostic radiographers. Following

the analysis of data, strategies to manage or reduce stress in diagnostic radiographers will be suggested. I intend selecting at least 101 radiographers in the eThekwini District.

The study will not affect the normal work routine as the questionnaires will take approximately 10 minutes to complete which can be done during the radiographer‘s personal time at home or during lunch break at work. I plan to commence data collection in January 2014 and complete the entire research process by May 2014.

The executive dean of the Faculty of Health Sciences, Professor T. Puckree as well as Mrs S. Naidoo a senior lecturer and Head of Department of Radiography are supervising the study. The direct benefit from the study is that a summary of the research findings will be made available to the management of the employees. The long term benefits are that the research findings will be made available to formulate interventional programmes in diagnostic departments to help alleviate stress, improve the emotional wellbeing of staff and thereby improve their working life as well as improving service delivery for patients. Hence I strongly believe that this study will benefit both the patients and diagnostic radiographers.

The empirical evidence from this study will attempt to create awareness of the existence of stress or potential stress in order to improve service delivery. There will be no additional costs to the radiographer or the hospital.

I hereby apply for permission to undertake this research amongst radiographers in your department. All information will be treated in confidence and no reference will be made to a specific authority. Diagnostic radiographers will be classified by the level of the healthcare institution they work in.

My proposal has been reviewed by the Faculty of Health Sciences research committee and approved by the Institutional Research Ethics Committee at the Durban University of Technology and permission to conduct the study has been obtained from the provincial department of health (see copy of permission letter attached). In addition a support letter has also been received from the eThekwini District (copy attached).

A copy of my research proposal has been attached for your perusal. Your support and permission to perform this study will be greatly appreciated. Should you have any queries please do not hesitate to contact me or my supervisor Professor Puckree at 031 373 2703 or by e-mailing her at puckreet@dut.ac.za.

Many thanks for considering my request

Yours Sincerely

_____

Nkululeko Gam (Mr)

M.Tech Student at DUT

**Appendix K: Letter of permission to King Edward VIII Hospital.**

The Manager

Radiography Department

King Dinuzulu Hospital Complex

P O Box Dormerton

DORMERTON

4015

Dear Ms Naidoo

**REQUEST FOR PERMISSION TO CONDUCT RESEARCH**

I am currently registered as a master's student at the Durban University of Technology in the Department of Radiography within the Faculty of Health Sciences. I would like to embark on a research project towards a Master's degree in Radiography.

The proposed title of my study is Occupational Stressors in Diagnostic Radiographers Working in Public Health Centres in the eThekwini District of KwaZulu-Natal.

This is a quantitative descriptive study as it involves the use of structured questionnaires to collect data with regards to causes of stress in diagnostic radiographers; to identify work related factors contributing to stress and to identify the individual/ demographic

factors associated with stress in diagnostic radiographers. Following the analysis of data, strategies to manage or reduce stress in diagnostic radiographers will be suggested. I intend selecting at least 101 radiographers in the eThekwini District.

The study will not affect the normal work routine as the questionnaires will take approximately 10 minutes to complete which can be done during the radiographer‘s personal time at home or during lunch break at work. I plan to commence data collection in January 2014 and complete the entire research process by May 2014.

The executive dean of the Faculty of Health Sciences, Professor T. Puckree as well as Mrs S. Naidoo a senior lecturer and Head of Department of Radiography are supervising the study. The direct benefit from the study is that a summary of the research findings will be made available to the management of the employees. The long term benefits are that the research findings will be made available to formulate interventional programmes in diagnostic departments to help alleviate stress, improve the emotional wellbeing of staff and thereby improve their working life as well as improving service delivery for patients. Hence I strongly believe that this study will benefit both the patients and diagnostic radiographers.

The empirical evidence from this study will attempt to create awareness of the existence of stress or potential stress in order to improve service delivery. There will be no additional costs to the radiographer or the hospital.

I hereby apply for permission to undertake this research at King Dinuzulu hospital. All information will be treated in confidence and no reference will be made to a specific authority. Diagnostic radiographers will be classified by the level of the healthcare institution they work in.

My proposal has been reviewed by the Faculty of Health Sciences research committee and approved by the Institutional Research Ethics Committee at the Durban University of Technology and permission to conduct the study has been obtained from the provincial department of health (see copy of permission letter attached). In addition a support letter has also been received from the eThekwini District (copy attached).

A copy of my research proposal has been attached for your perusal. Your support and permission to perform this study will be greatly appreciated. Should you have any queries please do not hesitate to contact me or my supervisor Professor Puckree at 031 373 2703 or by e-mailing her at puckreet@dut.ac.za.

Many thanks for considering my request

Yours Sincerely

_____

Nkululeko Gam (Mr)

M.Tech Student at DUT

**Appendix L: Letter of permission to Prince Mshiyeni Memorial Hospital.**


The Manager

Radiography Department

Prince Mshiyeni Memorial Hospital

Private Bag X07

MOBENI

4060

Dear Mr Mthethandaba

**REQUEST FOR PERMISSION TO CONDUCT RESEARCH**

I am currently registered as a master's student at the Durban University of Technology in the Department of Radiography within the Faculty of Health Sciences. I would like to embark on a research project towards a Master's degree in Radiography.

The proposed title of my study is Occupational Stressors in Diagnostic Radiographers Working in Public Health Centres in the eThekwini District of KwaZulu-Natal.

This is a quantitative descriptive study as it involves the use of structured questionnaires to collect data with regards to causes of stress in diagnostic radiographers; to identify work related factors contributing to stress and to identify the individual/ demographic

factors associated with stress in diagnostic radiographers. Following the analysis of data, strategies to manage or reduce stress in diagnostic radiographers will be suggested. I intend selecting at least 101 radiographers in the eThekwini District.

The study will not affect the normal work routine as the questionnaires will take approximately 10 minutes to complete which can be done during the radiographer‘s personal time at home or during lunch break at work. I plan to commence data collection in January 2014 and complete the entire research process by May 2014.

The executive dean of the Faculty of Health Sciences, Professor T. Puckree as well as Mrs S. Naidoo a senior lecturer and Head of Department of Radiography are supervising the study. The direct benefit from the study is that a summary of the research findings will be made available to the management of the employees. The long term benefits are that the research findings will be made available to formulate interventional programmes in diagnostic departments to help alleviate stress, improve the emotional wellbeing of staff and thereby improve their working life as well as improving service delivery for patients. Hence I strongly believe that this study will benefit both the patients and diagnostic radiographers.

The empirical evidence from this study will attempt to create awareness of the existence of stress or potential stress in order to improve service delivery. There will be no additional costs to the radiographer or the hospital.

I hereby apply for permission to undertake this research at Prince Mshiyeni Memorial hospital. All information will be treated in confidence and no reference will be made to a specific authority. Diagnostic radiographers will be classified by the level of the healthcare institution they work in.

My proposal has been reviewed by the Faculty of Health Sciences research committee and approved by the Institutional Research Ethics Committee at the Durban University of Technology and permission to conduct the study has been obtained from the provincial department of health (see copy of permission letter attached). In addition a support letter has also been received from the eThekwini District (copy attached).

A copy of my research proposal has been attached for your perusal. Your support and permission to perform this study will be greatly appreciated. Should you have any queries please do not hesitate to contact me or my supervisor Professor Puckree at 031 373 2703 or by e-mailing her at puckreet@dut.ac.za.

Many thanks for considering my request

Yours Sincerely

_____

Nkululeko Gam (Mr)

M.Tech Student at DUT

**Appendix M:Letter of permission to R K Khan Hospital.**


The Manager

Radiography Department

R K Khan Hospital

Private Bag X004

CHARTSWORTH

4030

Dear Mr Selvin

**REQUEST FOR PERMISSION TO CONDUCT RESEARCH**

I am currently registered as a master's student at the Durban University of Technology in the Department of Radiography within the Faculty of Health Sciences. I would like to embark on a research project towards a Master's degree in Radiography.

The proposed title of my study is Occupational Stressors in Diagnostic Radiographers Working in Public Health Centres in the eThekwini District of KwaZulu-Natal.

This is a quantitative descriptive study as it involves the use of structured questionnaires to collect data with regards to causes of stress in diagnostic radiographers; to identify work related factors contributing to stress and to identify the individual/ demographic

factors associated with stress in diagnostic radiographers. Following the analysis of data, strategies to manage or reduce stress in diagnostic radiographers will be suggested. I intend selecting at least 101 radiographers in the eThekwini District.

The study will not affect the normal work routine as the questionnaires will take approximately 10 minutes to complete which can be done during the radiographer‘s personal time at home or during lunch break at work. I plan to commence data collection in January 2014 and complete the entire research process by May 2014.

The executive dean of the Faculty of Health Sciences, Professor T. Puckree as well as Mrs S. Naidoo a senior lecturer and Head of Department of Radiography are supervising the study. The direct benefit from the study is that a summary of the research findings will be made available to the management of the employees. The long term benefits are that the research findings will be made available to formulate interventional programmes in diagnostic departments to help alleviate stress, improve the emotional wellbeing of staff and thereby improve their working life as well as improving service delivery for patients. Hence I strongly believe that this study will benefit both the patients and diagnostic radiographers.

The empirical evidence from this study will attempt to create awareness of the existence of stress or potential stress in order to improve service delivery. There will be no additional costs to the radiographer or the hospital.

I hereby apply for permission to undertake this research at R K Khan hospital. All information will be treated in confidence and no reference will be made to a specific authority. Diagnostic radiographers will be classified by the level of the healthcare institution they work in.

My proposal has been reviewed by the Faculty of Health Sciences research committee and approved by the Institutional Research Ethics Committee at the Durban University of Technology and permission to conduct the study has been obtained from the provincial department of health (see copy of permission letter attached). In addition a support letter has also been received from the eThekwini District (copy attached).

A copy of my research proposal has been attached for your perusal. Your support and permission to perform this study will be greatly appreciated. Should you have any queries please do not hesitate to contact me or my supervisor Professor Puckree at 031 373 2703 or by e-mailing her at puckreet@dut.ac.za.

Many thanks for considering my request

Yours Sincerely

_____

Nkululeko Gam (Mr)

M.Tech Student at DUT

**Appendix N: Letter of permission to Inkosi Albert Luthuli Central Hospital.**


The Manager

Radiography Department

Inkosi Albert Luthuli Central Hospital

Private Bag X 03

MAYVILLE

4058

Dear Mr Mathews

**REQUEST FOR PERMISSION TO CONDUCT RESEARCH**

I am currently registered as a master's student at the Durban University of Technology in the Department of Radiography within the Faculty of Health Sciences. I would like to embark on a research project towards a Master's degree in Radiography.

The proposed title of my study is Occupational Stressors in Diagnostic Radiographers Working in Public Health Centres in the eThekwini District of KwaZulu-Natal.

This is a quantitative descriptive study as it involves the use of structured questionnaires to collect data with regards to causes of stress in diagnostic radiographers; to identify work related factors

contributing to stress and to identify the individual/ demographic factors associated with stress in diagnostic radiographers. Following the analysis of data, strategies to manage or reduce stress in diagnostic radiographers will be suggested. I intend selecting at least 101 radiographers in the eThekwini District.

The study will not affect the normal work routine as the questionnaires will take approximately 10 minutes to complete which can be done during the radiographer‘s personal time at home or during lunch break at work. I plan to commence data collection in January 2014 and complete the entire research process by May 2014.

The executive dean of the Faculty of Health Sciences, Professor T. Puckree as well as Mrs S. Naidoo a senior lecturer and Head of Department of Radiography are supervising the study. The direct benefit from the study is that a summary of the research findings will be made available to the management of the employees. The long term benefits are that the research findings will be made available to formulate interventional programmes in diagnostic departments to help alleviate stress, improve the emotional wellbeing of staff and thereby improve their working life as well as improving service delivery for patients. Hence I strongly believe that this study will benefit both the patients and diagnostic radiographers.

The empirical evidence from this study will attempt to create awareness of the existence of stress or potential stress in order to improve service delivery. There will be no additional costs to the radiographer or the hospital.

I hereby apply for permission to undertake this research at Inkosi Albert Luthuli Central Hospital.

All information will be treated in confidence and no reference will be made to a specific authority. Diagnostic radiographers will be classified by the level of the healthcare institution they work in.

My proposal has been reviewed by the Faculty of Health Sciences research committee and approved by the Institutional Research Ethics Committee at the Durban University of Technology and permission to conduct the study has been obtained from the provincial department of health (see copy of permission letter attached). In addition a support letter has also been received from the eThekwini District (copy attached).

A copy of my research proposal has been attached for your perusal. Your support and permission to perform this study will be greatly appreciated. Should you have any queries please do not hesitate to contact me or my supervisor Professor Puckree at 031 373 2703 or by e-mailing her at puckreet@dut.ac.za.

Many thanks for considering my request

Yours Sincerely

_____

Nkululeko Gam (Mr)

**Appendix O Letter of permission to Wentworth Hospital**

The Manager

Radiography Department

Wentworth Hospital

Private Bag Jacobs

JACOBS

4026

Dear Mrs G. Cotchobos

**REQUEST FOR PERMISSION TO CONDUCT RESEARCH**

I am currently registered as a master's student at the Durban University of Technology in the Department of Radiography within the Faculty of Health Sciences. I would like to embark on a research project towards a Master's degree in Radiography.

The proposed title of my study is Occupational Stressors in Diagnostic Radiographers Working in Public Health Centres in the eThekwini District of KwaZulu-Natal.

This is a quantitative descriptive study as it involves the use of structured questionnaires to collect data with regards to causes of stress in diagnostic radiographers; to identify work related factors contributing to stress and to identify the individual/ demographic

factors associated with stress in diagnostic radiographers. Following the analysis of data, strategies to manage or reduce stress in diagnostic radiographers will be suggested. I intend selecting at least 101 radiographers in the eThekwini District.

The study will not affect the normal work routine as the questionnaires will take approximately 10 minutes to complete which can be done during the radiographer‘s personal time at home or during lunch break at work. I plan to commence data collection in January 2014 and complete the entire research process by May 2014.

The executive dean of the Faculty of Health Sciences, Professor T. Puckree as well as Mrs S. Naidoo a senior lecturer and Head of Department of Radiography are supervising the study. The direct benefit from the study is that a summary of the research findings will be made available to the management of the employees. The long term benefits are that the research findings will be made available to formulate interventional programmes in diagnostic departments to help alleviate stress, improve the emotional wellbeing of staff and thereby improve their working life as well as improving service delivery for patients. Hence I strongly believe that this study will benefit both the patients and diagnostic radiographers.

The empirical evidence from this study will attempt to create awareness of the existence of stress or potential stress in order to improve service delivery. There will be no additional costs to the radiographer or the hospital.

I hereby apply for permission to undertake this research in the Radiography department in your institution. All information will be treated in confidence and no reference will be made to a specific authority. Diagnostic radiographers will be classified by the level of the healthcare institution they work in.

My proposal has been reviewed by the Faculty of Health Sciences research committee and approved by the Institutional Research Ethics Committee at the Durban University of Technology and permission to conduct the study has been obtained from the provincial department of health (see copy of permission letter attached). In addition a support letter has also been received from the eThekwini District (copy attached).

A copy of my research proposal has been attached for your perusal. Your support and permission to perform this study will be greatly appreciated. Should you have any queries please do not hesitate to contact me or my supervisor Professor Puckree at 031 373 2703 or by e-mailing her at puckreet@dut.ac.za.

Many thanks for considering my request

Yours Sincerely

_____

Nkululeko Gam (Mr)

M.Tech Student at DUT

e-mail: nkululekog@dut.ac.za

## Appendix P: Permision letter from R.K. Khan Hospital

health
Department:
Health
PROVINCE OF KWAZULU-NATAL

R.K.KHAN HOSPITAL/ETHEKWINI DISTRICT
OFFICE OF THE CEO
PRIVATE BAG X004
CHATSWORTH
4030

Tel.: 031-4596001
Fax. No. 031-4011247
Email: reena.ramcharan@kznhealth.gov.za
www.kznhealth.gov.za

**ENQUIRIES: DR P.S. SUBBAN**

**21 JANUARY 2014**

Mr N. Gam
Department of Radiology
Durban University of Technology
DURBAN

Dear Mr Gam

**RE: RESEARCH STUDY : WORK RELATED PSYCHOSOCIAL STRESSORS IN DIAGNOSTIC RADIOGRAPHERS WORKING IN PUBLIC HEALTH FACILITIES IN THE ETHEKWINI DISTRICT OF KZN**

Permission is granted to conduct your study at this institution.

Please note the following:

1. Please ensure that you adhere to all the policies, procedures, protocols and guidelines of the Institution with regards to this research.
2. Please ensure this office is informed before you commence your research.
3. The Hospital will not provide any resources for this research.
4. You will be expected to provide feedback on your findings to this institution.
6. Kindly liaise with Mr Selvam Pillay, Radiography Manager, Ext. 6130.

Yours faithfully

[redacted]

**DR P.S. SUBBAN**
**HOSPITAL CEO**

## Appendix Q: Permission letter from King Edward VIII Hospital

health
Department:
Health
PROVINCE OF KWAZULU-NATAL

**OFFICE OF THE HOSPITAL CEO**
KING EDWARD VIII REGIONAL HOSPITAL
Private Bag X02, CONGELLA, 4013
Corner of Rick Turner & Sydney Road
Tel.031-3603853/3015; Fax.031-2061457:
Email.rejoice.khuzwayo@kznhealth.gov.za:
www.kznhealth.gov.za

**Ref.: KE 2/7/1/ (05/2014)**
**Enq.: Mrs. R. Sibiya**
**Research Programming**

5 February 2014

Mr. NP Gam
27 Brisbane Road
Umbilo
**DURBAN**
4001

Dear Mr. Gam

**Protocol: Work related psychosocial stressors in Diagnostic Radiographers working in Public Health Facilities in the eThekwini District of KwaZulu-Natal**

Your request to conduct research at King Edward VIII Hospital has been approved.

Please ensure the following:

- That King Edward VIII Hospital receives full acknowledgment in the study on all publications and reports and also kindly present a copy of the publication or report on completion.

- Before commencement:

* Discuss your research project with our relevant Directorate Managers
* Sign an indemnity form at Room8, CEO's Complex, Admin. Block.

The Management of King Edward VIII Hospital reserves the right to terminate the permission for the study should circumstances so dictate.

Yours faithfully

**SUPPORTED/~~NOT SUPPORTED~~**

[redacted]

07/04/2014

**DR. OSB BALOYI**
**ACTING CHIEF EXECUTIVE OFFICER**

**DATE**