



Cape Peninsula
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PAIN ASSESSMENT: THE ROLE OF THE RADIATION THERAPIST

By

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DECLARATION

I, Kofi Adesi Kyei, declare that the content of this thesis represents my own work, and that the thesis has not previously been submitted for academic examination towards any qualification. Furthermore, it represents my own opinions and not necessarily those of the Cape Peninsula University of Technology.

Signed

Date

ABSTRACT

The focus of this study is the role of the Radiation Therapist (RTT) in the assessment of pain in cancer patients. The study was carried out at a Radiotherapy Department of a large Teaching Hospital in Ghana and addressed the following research questions; 1) What is the role of the RTT in the assessment of pain in cancer patients, 2) Why should the RTTs' role be extended to include pain assessment, 3) What are the challenges for the RTT when taking on the role of pain assessment in radiation oncology and 4) How can pain assessment become a routine role for the RTT in a busy radiation oncology department? 5) How would this extended role of the RTT assist management of patient?

This study was conducted because many cancer patients suffer pain and to many, it can be more debilitating than the primary disease itself. The RTTs who are involved in the daily management of cancer patients during their radiation treatment can find it stressful to witness their patients going through such pain particularly when they do not have a role in the management of pain. In Ghana, there are few radiation oncologists (ROs) and therefore an extended scope for RTTs, that includes pain assessment and a meaningful contribution to the management of their patients' pain, would be advantageous to all.

A mixed method research approach was adopted for gathering quantitative and qualitative data. This included data collection of; interview, observation and review of existing document. A pain questionnaire SF-MPQ-2 by Melzack (2009) was adapted as a tool for assessing pain in the study participants. RTTs administered the questionnaire and experienced the role of pain assessment being included in their daily routine. Ninety patients were asked to complete the questionnaire after carefully and willingly consenting to participate in the study.

The findings of this study built knowledge on pain in cancer patients through research in a radiotherapy department in Ghana. This included gaining a deeper understanding of how patients describe their pain and how location, site and other factors increase or decrease their pain. Data analysis further revealed and confirmed that RTTs have a role in the assessment of pain which will contribute to the management of that pain and that pain assessment can be included in the RTTs role in a busy radiation oncology unit. The extended role recommended due to the findings of this study are that RTTs can: administer a limited pain questionnaire, use this for clinical assessment of patients with pain, refer patients who need urgent medical attention to the doctors, monitor the patients daily especially those on 'watchful waiting' and those receiving chemotherapy alongside radiotherapy, provide meaningful suggestions to the multidisciplinary team on the management of the pain, give reassurance and support to patients regarding their pain, offer careful monitoring to patients undergoing radiotherapy, promote planning as a routine practise in the department, educate and counsel patients and their relatives or care givers about pain, and provide appropriate positioning during simulation and treatment for patients suffering with pain.

It is evident that extending the RTTs' role is a need in the radiotherapy department in Ghana and by so doing, the quality of care to patients will be improved. Role extension will lead to reduction of the workload of the few oncologists as well as reduce patients' waiting time. This will further improve patient satisfaction and staff job satisfaction. The research suggests and recommends ways of achieving this extended role such as the regularization of pain assessment into the existing roles of the RTT through the appropriate professional body and use of the new pain assessment tool that was developed through the study.

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DEDICATION

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ACRONYMS/ABBREVIATIONS

ASRT:	American Society of Radiation Technologist
CARMT:	Canadian Association of Medical Radiation Technologists
CoR:	College of Radiographers
GAEC:	Ghana Atomic Energy commission
HPC:	Health Professional Council
IAEA:	International Atomic Energy Agency
ISSRT:	International Society of Radiographers and Radiologist Technologists
KATH:	Komfo-Anokye Teaching Hospital
KBTH:	Korle-Bu Teaching Hospital
MRT:	Medical Radiation Technologist
NCCN:	National Comprehensive Cancer Network
NHIS:	National Health Insurance Scheme
NHS:	National Health Service
NZIMR:	New Zealand Institute of Radiation Technologist
RCR:	Royal College of Radiologist
RTD:	Radiotherapy department
RTT:	Radiation therapist
SCoR:	Society and College of Radiographers
RO:	Radiation Oncologist

CHAPTER ONE

INTRODUCTION: ROLE OF RADIATION THERAPIST IN PAIN ASSESSMENT

1.1 Introduction

The scope of this research was to explore the role of RTTs in Ghana in pain assessment in cancer patients. The study was conducted in the Radiotherapy Department (RTD) of a Teaching Hospital in Ghana. The study employed a mixed method design involving a pain questionnaire survey and a case study approach. Through individual and focus group interviews, document reviews and the application of a patient survey, investigations were conducted to build understanding of pain assessment in radiotherapy. The study aim was to enable the RTT in Ghana to contribute to the management of pain in order to improve the quality of care of the patients undergoing radiotherapy.

1.1.1 The Radiation Therapist

The RTT is a health care professional who prepares and administers high doses of radiation mainly for the treatment of cancer. RTTs receive formal education including studies of physics, radiation safety, human anatomy, physiology, pathology and patient care (Johnson, Roberts, Trotti & Greenberg, 1998). The RTT, also sometimes called a therapy radiographer or radiation therapy technologist, is a key member of the radiation oncology team who works closely with ROs, medical physicists and other members of the healthcare team to provide a supportive patient-centred service (American Society of Radiologic Technologists, 2007).

1.1.2 Qualities of the Radiation Therapist

Although the RTT works in a highly technical environment, they remain aware of their role in providing patient care and take appropriate steps to ensure that they can assist patients in feeling comfortable during their radiation therapy (Cardiff University, 2007).

According to the Cardiff University (2007), the RTT possesses a high level of competence and is confident in handling sophisticated technological devices such as the Cobalt-60 machine, Computer Tomography Simulator and Linear Accelerator. In

addition to this, the RTT must enjoy working in a team, always work safely, quickly and accurately and must always be willing to take responsibility. The RTT is someone who is able to make decisions, is caring and compassionate in nature, has good communication skills, and is physically fit (CoR, 2000).

1.1.3 Research focus

The RTT's role is focused on the preparation of patients and the delivery of external beam radiotherapy. Within this highly technical role, there is the important extended role of patient care. The RTT must at all time practice, being aware of the patients need and since many patients in Ghana suffer diseases and/or treatment related pain, patient care must include awareness of pain. In Ghana, the role of pain assessment is unstructured and without any protocol or tools that facilitate routine pain assessment. This study therefore sought to investigate and understand the role of the RTT in the assessment of pain in order to improve the contribution of the RTT as a member of the multi-disciplinary team with regard to pain management for the benefit of the patients and the radiation oncology team. This was done through a case study and by testing RTT's administration of a pain questionnaire to a patient sample.

1.1.4 Research questions

The research questions of the study were;

- a. What is the role of the RTT in the assessment of pain in cancer patients? [Research methods used to answer this question were prospective data gathering through RTTs actually administering a pain questionnaire as well as generation of text data through observations and interviews with RO, a nurse and RTTs].
- b. Should the RTT's role be extended to include pain assessment? [This question was answered through the case study including interviews with RO, nurse and RTTs].
- c. What are the challenges for the RTT when taking on the extended role of pain assessment in radiation oncology? [The research method used was to obtain feedback from the RTTs during the administration of the patient questionnaire survey].

d. Can pain assessment become a routine role for the RTTs in a busy radiation oncology department? [The research method used to answer this question was a case study comprising of interviews and observation].

e. How would this extended role of the RTT assist management of the patient? [The research method used was a patient survey to “trial” the actual pain questionnaire by the RTTs and integration of case study data].

1.1.5 Research objectives

a. To identify the role of the RTT in the assessment of pain in radiation oncology.

b. To investigate whether there is a need for role extension for RTTs to include pain assessment as a routine role.

c. To uncover the challenges faced by RTTs when taking on pain assessment as a role.

d. To develop a tool to guide pain assessment of patients with cancer by RTTs and allow the RTT to incorporate pain assessment as a routine function.

e. To describe a structure that will allow RTTs in Ghana to take an active part in the extended role of pain assessment in order to improve patient management.

1.2 Rationale

Pain is a known problem associated with many cancer patients in Ghana and as in other countries pain may undermine the quality of life of a patient and profoundly burden the family and the carer (Wells, 2003).

Despite advances in the understanding of pain and pain management, pain control remains a significant problem for patients with cancer (National Cancer Institute, 2009; Wells, Dryden, Guild, Levack, Farrer, & Mowat, 2001; Rogers & Todd, 2000).

Eighty eight percent of patients with advanced cancer have pain and for these patients, controlling the pain and managing the symptoms are important goals of treatment (Zech, Grond, Lynch, Hertel & Lehmann, 1995). Cancer pain management

is essential and it depends on the ability of the staff to conduct a comprehensive assessment (Cleary, 2000).

RTTs in Ghana do not have an official role in the management of pain, yet they spend most time with the patients during the period of radiotherapy and are in the best position to care for them. The waiting periods for patients visiting the doctors for review are long due to the small number of doctors in the department. Patients were aware of the long waiting time but still wanted to see the doctor. It is therefore heartbreaking to hear from some patients that they left the hospital without being attended to by a doctor in order to catch a bus.

A study conducted at the same department in 2008 showed that patients were satisfied with the care they received from the staff (Kyei, Arthur, Vanderpuye & Antwi, 2008). However, as the workload of the doctors continues to increase in the department, it has been observed that quality of care delivered to patients has been affected. Pain assessment has therefore become a recognised area where the RTTs can take on an extended role which could have a positive impact on the team and improve the quality of care delivered to the patients during radiation treatment. Patients spend more time with the RTT than any other healthcare practitioner in the radiation oncology department, hence extending the RTTs role to include assessment of pain and its management could further increase patient satisfaction.

The aim of this study was to identify the role of the RTT in the assessment pain. The outcome of this study can be used to guide the multi-disciplinary team towards achieving the goal of good pain management in radiation oncology to the benefit of patients and staff.

1.3 Background to the study

This section presents a brief overview of pain, a short history of Ghana, radiotherapy sciences in Ghana and the professional scope of RTTs in Ghana.

1.3.1 Pain

It is often assumed that the greatest problem the cancer patient must deal with is diagnosis, but for many patients, the pain associated with their disease makes daily life more difficult and unbearable than the cancer itself (Wells, 2003).

Studies of various populations suggest that 55% of all cancer patients experience pain (Higginson & Edmonds, 2000). Studies, with similar findings state that, approximately 30% to 50% of people with cancer experience pain while undergoing radiation treatment, whereas 70% to 90% of people with advanced cancer experience pain (Pauline & Portenoy, 1999; Portenoy, Thaler, Kornblith, Lepore, Friedlander-Klar & Coyle, 1994). The high incidence of pain with advanced disease is relevant since the patient data of the study site shows that the majority of patients treated between the years 2005-2008 presented with advanced cancer.

According to Zech, *et al.*, (1995), two-thirds of cancer patients who experience severe pains have their pain effectively controlled with radiotherapy. Effective management of pain is dependent on a thorough assessment of the patient's experience of pain, including the type, duration, severity and the manifestation of the symptom (Faithfull & Wells, 2003). Successful management of cancer pain is therefore essential and can allow more effective administration of radiotherapy (McQuay, Carroll & Moore, 1997).

In order to provide a patient-centred service that offers a supportive environment for our patients with pain, it is necessary that the RTT contributes to pain management as a member of the multidisciplinary healthcare team.

1.3.2 Ghana

Like any other country, Ghana is faced with various diseases that pose a threat to the health of the people living there. Diseases are categorized into, 1) Food or waterborne diseases such as bacterial and protozoa diarrhoea, hepatitis A, and typhoid fever; 2) Vector borne diseases such as malaria; 3) Water contact disease such as schistosomiasis; 4) Respiratory disease such as tuberculosis and 5) Animal contact disease such as rabies (The World Factbook, 2009).

In 1993, the World Health Organization (WHO) and the International Atomic Energy Agency (IAEA) estimated that Ghana had over ten thousand cases of cancer. Over the past fifteen years, the number of new cancer cases presenting at the Oncology Unit of the nation's biggest hospital increased from 700 in the year 2000 to over 1800 in the year 2008 according to patient data for the only radiotherapy department in Accra, Ghana.

Socio-economic problems in Ghana over the recent years, which impact on the cancer patients, include; illiteracy, poverty, ignorance about the disease, late referrals, lack of early detection programmes and lack of effective cancer control and education programmes. Most of the treatments are therefore palliative and according to patient data in the department, pain affects a significant number of the patients.

More than 250 languages and dialects are spoken in Ghana (Ghana Home, 2009). English is the country's official language and is mostly used in government and business affairs. It is also the standard language used for educational instruction (Ghana-Wikipedia, 2009). Local Ghanaian languages are divided into two different groups of family (The Commonwealth Youth Exchange Council, 2009). Languages belonging to the Kwa subfamily are found mostly to the south of the Volta River, while those belonging to the Gur subfamily are found mainly to the north. The Kwa group, which is spoken by about 75% of the country's population, includes the Akan, Ga-Dangme, and Ewe languages. The Gur group includes the Gurma, Grusi, and Dagbani languages (LaVerle, 1995). According to Ghana-Wikipedia, (2009), nine languages have the status of government-sponsored languages: Akan (specifically Ashanti Twi, Fanti, Akuapem Twi and Akyem), Kwahu, Nzema, Dagaare/Wale, Dagbani, Dangme, Ewe, Ga, Gonja/Kasem. Though not an official language, Hausa is the lingua-franca spoken among Ghana's Muslims who comprise about 16% of the population (Hausa language, 2009).

1.3.3 Radiotherapy in Ghana

In October 1997, Radiotherapy began in Ghana, with the help of the International Atomic Energy Agency (IAEA) and the Ghana Atomic Energy Commission (GAEC) in collaboration with the Ministry of Ghana. The first department was in Korle-Bu

Teaching Hospital (KBTH) the nation's biggest teaching hospital. The equipment was a Cobalt-60 machine, an Orthovoltage machine, a Simulator, a low dose-rate after loading caesium brachytherapy unit and a mould room. The human resources were three ROs, two RTTs and a medical physicist as at 2000.

According to the information received from the head of department, the human resources increased from one RO in 1997 to three in 2000 and one RTT in 1997 to two in 2000. Also according to the head of department, referrals of patients were initially from regional hospitals in the country but later there were referrals from the neighbouring countries of Togo, Benin, Cote D'Ivoire, Burkina Faso, Liberia and others.

Efforts were put in place to open a second centre to serve the northern sector leaving Korle-Bu Teaching Hospital to serve the southern sector. In 2004 a radiotherapy centre was commissioned at the Komfo Anokye Teaching Hospital (KATH) in the Ashanti Region. This is the nation's second biggest hospital. There was a delay in commencement due to a lack of staff especially ROs and RTTs. The Ministry of Health decided that one of the three ROs should move to KATH to solve the need for RTTs, help was sought from the Sudanese Government to release two RTTs to start the centre.

With the introduction of the training of RTTs in 2002, Ghana can now boast many RTTs as at 2009. This however is not the case with the ROs since they are still the same number that began in 2000. This has increasingly brought pressure on the doctors and has unavoidably affected the quality of care of patients undergoing radiotherapy.

1.3.4 The Radiography profession in Ghana

In the 1980s the Ministry of Health in collaboration with the Ministry of Education in Ghana and the Korle-Bu Teaching Hospital started a two-year programme to train Diagnostic Radiographers. The qualified personnel were called X-ray Technicians and they were awarded a certificate. This trend changed in the 1990s with the introduction of a 3-year Diploma programme at the University of Ghana which subsequently transformed to a 4-year Degree program in the year 2000. Graduate

radiographers undertake one year internship as a further training in order to become fully competent in their new profession.

Due to the compounding problems encountered by the Government of Ghana as a result of an inadequate number of RTTs to meet the needs, the Ministry of Health, in 2002, through the School of Allied Health Sciences of the University of Ghana began a 4-year Degree programme in Therapy Radiography. The first group of students graduated in 2006 and after completing their internship were quickly absorbed by the two hospitals. Just three years after the first graduation, Ghana can boast a staff of eleven RTTs in KBTH and four in KATH with fifteen students in the programme at the University.

Radiography is a growing profession in Ghana and all efforts are still on going towards the establishment of a Council for the Allied Health Professions. The Association of Radiographers and RTTs in Ghana is also still struggling to gain roots in the country as it lacks dedicated persons and a defined body to manage its affairs.

1.3.5 The scope of the radiation therapy profession in Ghana

The scope of the profession of radiation therapy is regulated by the Ministry of Health in Ghana since radiography has no professional council. The Ministry has defined regulations for the profession to prevent unqualified persons from illegally practicing within the scope. RTTs can therefore not practice anywhere in Ghana apart from the two available radiotherapy centres.

The professional scope of the RTTs defined by the Ministry of Health consists of; delivery of treatment, localization of tumours (simulation), preparation of cast and moulding of customized blocks (mould room), care of patients, keeping of patient records, performing quality assurance, and radiation protection. At the moment, efforts are still ongoing to get an official scope of practice through the Council of Allied Health Professions which is on the verge of establishment.

1.3.6 The taxonomy of radiation therapist

The taxonomy of RTTs varies from country to country (Raymond, O'Brien, Laplander, & Harris, 2005). Previously the term radiotherapists was used to refer to specialist doctors in radiation oncology; now designated RO. Radiotherapy

radiographer and therapy radiographer were the terms in use and are still often used. In Ghana and across Africa, therapy radiographer, radiation therapy technologist and radiation therapist (RTT) are commonly used within clinical departments and the profession.

The International Atomic Energy Agency (IAEA), which is extensively involved in the training of RTTs and which supports radiotherapy departments through provision of training and facilities in member countries, recently adapted radiation therapy technologist or radiation therapist (Coffey, Engel-Hills, El-Gantiry, Benjaafar, Wilkinson & Vikram, 2006).

In the UK, the term therapeutic radiographer is chosen for official use by the Health Professions Council (2003). In Canada, the Canadian Association of Medical Radiation Technologists (CAMRT) uses the term medical radiation technologist (MRT) in official documents (CAMRT, 2007). In the USA, however, the taxonomy is used to differentiate separate job descriptions. RTT refers to radiographers involved exclusively in the care and treatment of cancer patients whereas medical dosimetrists are responsible for the planning of the treatment of cancer patients. This is in contrast to many countries such as; the UK, Canada, South Africa and Ghana where therapy radiographers receive qualifications to practice in the care, planning and treatment of the cancer patients.

For the purposes of this thesis, the term RTT is used to describe a practicing therapy radiographer. The terms radiographer and radiography are used in this thesis when the discussion covers all radiographers or the profession of radiography.

1.4 Overview of thesis

A brief outline of each of the chapters of this thesis is given below.

1.4.1 Chapter 2- Literature review: Radiographers and their role

In the next chapter the literature on radiography is outlined. This includes literature on the discovery of X-rays, radiography categories and the role of the RTT. It further discusses role extension in both diagnostic radiography and radiation therapy and barriers to role extension. This chapter ends with literature on the training and

education suggested in several studies to be helpful in role extension for radiographers in Ghana.

1.4.2 Chapter 3- Literature review: Pain

Chapter three presents the reader with literature on pain. It describes the nature of pain and gives classifications and descriptions of pain. The management of pain which includes assessment and treatment modalities used for pain such as medication, radiotherapy, physical therapy, nerve blocks, psychosocial, and other supportive therapies are presented. The various methods of pain assessment are summarized in a tabular form.

1.4.3 Chapter 4- Research Methodology

This chapter presents the research design for this study. A mixed method design using qualitative and quantitative data is discussed. The methodology was a case study, including individual and focus group interview, documents, observation and a pain questionnaire. Details such as selection criteria of participants, the site and research assistants is described as well as data collection methods, data analysis and ethical considerations.

1.4.4 Chapter 5- Findings: Pain assessment and RTTs Role

In chapter five, the individual and focus group interviews, observations and text information are presented. Findings from the patient pain survey are also presented in both graphical and tabular form.

1.4.5 Chapter 6- RTTs role in pain assessment

In the final chapter, the role of the RTTs in the assessment of pain in cancer patients is discussed including other relevant variables on patient's pain. Several recommendations from the findings are made and possible areas for further research are outlined. The research questions are addressed and in conclusion, a simple tool for assessing patient's pain, developed through the study, is presented.

CHAPTER TWO

LITERATURE REVIEW: RADIOGRAPHERS AND THEIR ROLE

2.1 Introduction

It was not long after the discovery of X-rays, in 1895, that X-rays were used for diagnosis and treatment in medicine. This was the beginning of the profession of radiography. The enormous value of X-rays to medical science ensured their continued use even though it preceded knowledge of the dangers of ionizing radiation (Radiography-Wikipedia, 2009) and learning about radiation safety came at a cost to the practitioners.

Radiography has taken two distinct directions, diagnosis and treatment. Radiation therapy is the category that deals with the use of ionizing radiation for the treatment of tumours. High technology equipment, including the linear accelerator and cobalt-60 external beam units, and brachytherapy machines are operated by well trained professional RTTs. The role of these RTTs is the focus of this research.

2.2 The Role of the Radiation Therapist (RTT)

The RTT is an important member of the radiation oncology team (CoR, 2005a). They develop a supportive relationship with the patients and their families (Bureau of Labour Statistics, 2007) and contribute to patient management through provision of pre-treatment information, management of radiotherapy side effects, assessment of the patients' psychosocial and physical status during treatment and referral of patients to other care providers when necessary (Leaver and Teresa, 2000; CAMRT, 1998).

The RTT prepares the radiation therapy treatment through simulation and planning, in collaboration with the RO and medical physicist (Cardiff University, 2007). They are also responsible for the administration of the treatment. As part of this responsibility; they exercise judgment in several areas, such as, identifying and documenting any error to the expected treatment outcome (Leaver and Teresa, 2000).

RTTs therefore require a unique combination of technical, clinical and interpersonal skills (Bureau of Labour Statistics, 1998-99). They must be knowledgeable and understand the history of the cancers they encounter so that they can communicate

effectively and advise patients and their families on their diverse problems that confront them (University of Liverpool, 2008).

2.3 Role extension in radiography

In order to enhance understanding of role extension within the context of this research it is discussed by way of an introduction for diagnostic radiography and then in more detail as it applies to radiation therapy. For this discussion the term ‘radiographer’ is used for the diagnostic radiographer and RTT for the radiographer in radiation oncology.

2.3.1 Introduction

Development within health professions occurs as a response to a diversity of external and internal forces such as policy initiatives, technological advancement, pressure to reduce workloads on the staff and attempts to reduce patient waiting times. Although it can be argued that some developments are the natural advancement of a maturing profession, the majority of them are as a result of these forces (Cameron & Masterson, 2000).

The term extend is defined as ‘to stretch or continue to add something in order to make it bigger or longer’. The terms ‘extension’ is commonly used to describe the clinical practitioner role (Hardy & Snaith, 2006). Such role extension in healthcare practitioners implies supplementary skills and responsibilities that extend beyond the statutory responsibilities and competencies at the point of professional registration (White & McKay, 2003; Dimond, 2002).

Role development, another term for role extension, is about making a positive impact on patient care. It involves increasing professional scope so that the services are more patient-centred. Through this health and well-being and clinical effectiveness is improved (Lunday, 2005). Role development must build on what has already been achieved in order to offer a better service to the public and new opportunities to staff at all levels of the workforce. It also furthers the skills and knowledge of the individual staff involved (Department of Health, 2004).

The College of Radiographers’ publication *Role Development in Radiography* (1996a) defined role development as representing quantitative and qualitative change

in the way radiographers contribute to patient management and health care services. In the United Kingdom, the concept of role development was introduced into the career structure for the Radiographers in the year 2000 with the Educational and Professional Development Strategy (CoR, 2000). This concept supported ways of improving Radiographers' service to patients. Subsequently, radiographers have responded to the continuous need of service and have extended their scope of practice in recent years to meet the multiplicity and complexity of health care (CoR, 2003a).

Generally role extension in radiography is the inclusion of new activities which were not part of the usual role of radiographers (and perhaps used to be done by other professionals such as radiologists, oncologists or physicists) (CoR, 2003a). Paterson (1995) concluded therefore that some activities that may have been considered role development in the past, and which had become normal roles for radiographers, would not then be considered as role developments.

In the UK, the Society and College of Radiographers supports radiographers who wish to undertake role development (CoR, 2003b) and as a result, new roles have now emerged that involve the radiographers working outside their field and beyond normal professional boundaries (Colyer, 2000). In America, the American Society of Radiologic Technologists (ASRT) has begun discussions with other organizations to develop advanced clinical roles for registered radiographers which will support role development (May, Martino & McElveny, 2008). In Canada, The Canadian Association of Medical Radiation Technologists (CAMRT) has adopted the degree programme as the entry qualification to develop an advanced practice role in order to encourage role development among radiographers (Robertson, 2007).

In Australia, little progress has been made towards the development of advanced practice for radiographers (Australian Institute of Radiography, 2005a). Many radiographers in Australia however argue that there are elements of advanced practice hidden in their clinical roles (Smith, Yelder, Ajibulu & Caruana, 2008). In a survey of members of the Australian Institute of Radiography (AIR) (2005a), 54% of the 1186 diagnostic radiographer respondents said that they unofficially interpret trauma images for doctors. Meanwhile, 40% of the 169 RTT respondents said that a senior or chief RTT approves the final treatment plan in their department, rather than a RO

(Australian Institute of Radiography, 2005b). According to the radiographers, such duties are inherent roles that have not yet been made official hence the report of little progress by the AIR.

Role development for radiographers in New Zealand was also informal, until in 2005, the New Zealand Institute of Medical Radiation Technology (NZIMRT) established a national approach towards role development, which have so far received support and input from the Government and other major stakeholders in the country (Smith, *et al.*, 2008).

A survey carried out in 2004 by the International Society of Radiographers and Radiological Technologists (ISRRT) on the “Conditions for the Education of Radiographers in Africa” has provided insight into the level of education in Africa towards role advancement (International Society of Radiographers and Radiological Technologists, 2005). For example, there are differences such that there is a 6-month in-service training programme in the Democratic Republic of Congo and 3- to 4-year University programmes in South Africa, Kenya, Ghana, Nigeria and Uganda. These countries are amongst the leaders in Africa in the development of advanced roles for radiography (Cowling, 2008).

In South Africa, the Professional Board for Radiography and Clinical technology of the Health Professions Council of South Africa (HPCSA) has endorsed two important role extension activities within the scope of radiographers; pattern recognition and reporting by a sonographer on ultrasound investigations if a radiologist is not available (Government of South Africa, 1999). Williams (2006) commented in her article that evidence has established the benefit of role extension to the patient, and that South Africa should be able to benefit by the extension of radiographers’ role.

In Uganda, the Allied Health professional Council, with support from the Ministry of Health have endorsed a Pattern Recognition Curriculum with a one-year postgraduate diploma programme that allows radiographers to provide an opinion on plain chest, skeletal and abdominal radiography (Bule, 2007). These they believe have been embraced by many Radiographers in the country and have contributed to role development in the profession.

In Kenya, an RTT commented on the situation in Africa that; “for radiography to be at par in all regions of the world and relative and relevant to other health professions, concerted and deliberate effort and provision has to be made through strategies such as peer review mechanisms, partnerships, integration, human capacity and technological development, to provide a seamless service throughout the world” (Barare, 2008).

In Ghana not much has been seen in role development in radiography. This study seeks to set a foundation for role extension in the country. Evidence from studies in UK show that doctors and even some patients accept that other health professionals can, with appropriate training gain the necessary skill to undertake new roles without compromising the quality of care provided (Spencer, 2003; Saxton, 1992).

2.3.2 Diagnostic radiography

Role extension in diagnostic Radiography has seen growth since its introduction, especially in the United Kingdom, to the extent that The Royal College of Radiologists (RCR) in the UK have acknowledged that some tasks could be delegated to competent Radiographers (The Royal College of Radiologist, 1996). As a result of this recognition by the RCR, The College of Radiographers continues to encourage its members to seize these opportunities since it would benefit patients care (CoR, 2003a).

A survey in diagnostic radiography by Paterson (1995) came to a conclusion that role development would be unstoppable looking at the trend of growth. In 1996, the revised Code of Professional Conduct in UK encouraged the diagnostic radiographers to continue in the development of their professional role and that they should initiate and participate in role development activities (CoR, 1996b). The College of radiographers has since supported the idea of professional development in the role of radiographers. According to them, it would benefit the patients, the profession and even encourage other radiographers to seize all opportunities for role development presented to them (CoR, 1996a).

In 1997, *Reporting by Radiographers: Vision Paper* (CoR, 1997) further encouraged diagnostic radiographers to advance their roles in the profession. The paper also stated that reporting by radiographers was not an option for the future, but a

requirement. Four years later, *Prescribing by Radiographers: another Vision Paper* (CoR, 2001) followed a similar format to inform radiographers of the imminent opportunities in the prescribing, supply and administration of medicines. Other radiography journals such as *Radiography Synergy* and magazines such as *Synergy News* have several articles and news items on role development, demonstrating the developing nature of the work of radiographers. For example, December 2002 *Synergy* contained articles on role development for radiographers working in Accident and Emergency and *Synergy News* contained news of the introduction of a system to reward radiographers for their many and continuing role extensions (Stelmach, 2002).

2.3.3 Specific areas of role extension and specialization in diagnostic radiography

Areas such as ultra-sonography, administration of intravenous injection, prescribing, gastro-intestinal radiography, reporting, urology/vascular and nuclear medicine have become role extension in diagnostic radiography (CoR, 2003a).

Ultrasound is a branch in radiography where radiographers have worked independently for a number of years issuing diagnostic report with recommendations for treatment and referral (CoR, 2003a). Obstetric scanning, including independent reporting was one of the first recognized radiographer led services which unlocked several current roles in radiography (CoR, 2003a).

Another area that has provided role development opportunities for radiographers is the administration of injections especially to those working in gastro-intestinal, urological and nuclear medicine departments. The College of Radiographers' Certificate of Competence in Administering Intravenous Injections was introduced in 1996 (CoR, 1996b).

In 1997, the Gastro Intestinal Radiographers Special Interest Group (GIRSIG) was set up in UK to provide a forum for radiographers in gastro-intestinal radiography (CoR, 2002). Role development in this speciality however began in 1998 with radiographers conducting barium enemas, upper gastro-intestinal fluoroscopy and other examinations (CoR, 2002). These examinations have now become a recognised role for radiographers in the UK with minimal input from doctors (CoR 2003a). According to The College of Radiographers (2003a), radiographers in some

developed countries like the UK and the USA, now undertake paediatric micturating cystograms (including catheterisation), adult cystograms and nephrostograms in urology. Similarly, Venography has also become a well established area for radiographers in the developed countries and there is an involvement of radiographers in all aspects of vascular interventional work within the health care team (CoR, 2002).

According to Hogg & Holmes, (2000), an increasing number of trained radiographers other than the Nuclear Medicine Physicians/radiologists are increasingly interpreting nuclear medicine studies.

Reporting by radiographers in the developed countries begun with plain film, chest radiography, skeletal appendicular and axial reporting according to CoR, (2002).

Radiographers now report in a wide range of areas including ultrasound, mammography, magnetic resonance imaging, computer tomography, nuclear medicine, gastro-intestinal, and all general and accident and emergency radiography (CoR, 2002).

2.3.4 Radiation therapy

The Board of faculty of Clinical Oncology (2002) in the UK reported and recommended some roles for its department and were supported by the College of Radiographers (2003a). This report suggested that each department of radiation oncology must:

- develop new roles crossing traditional professional boundaries and widen opportunities for professional development (CoR, 2003a)
- extend the role of staff to improve communications with patients (CoR, 2003a),
- develop new roles that cross existing boundaries, including the provision of care (CoR, 2003a),
- encourage extension of roles in radiotherapy planning, delivery, ‘on treatment’ review and follow-up (CoR, 2003a).

In a survey by Treeby (2008) on patient satisfaction, it was reported that many radiographers were now working beyond their traditional boundaries and as a result have absorbed wider responsibilities. Richards, (2007) commented that extending the role of RTTs in cancer departments will, improve service and contribute to quality patient care whilst enabling both personal and career development for those involved. Cameron (2004) highlighted also that with this potential for role development, RTTs may increase their job satisfaction and aid future recruitment.

Recently in the United Kingdom, the Department of Health (2007) reported that approximately 80% of the cancers to be treated by radiotherapy could be managed by RTTs whereas the remaining 20% of complex cases may need direct input from the RO.

In recent times, there has been expansion of 'new' or extended RTT roles such as running of review clinics (University of Liverpool, 2008; Cameron, 2004), giving clinical advice to patients and formal counselling of patients (Cameron and Masterson, 2002).

2.3.5 Specific areas of role extension and specialization in radiation therapy

Dosimetry (planning)

Dosimetry or planning is an example of a long established role development for the RTTs which have now become a recognised role in many developed countries (CoR, 2002). In Ghana, ROs and medical physicists are the professionals involved in planning and this role has not yet been formally added to the scope of the RTTs. It is therefore considered as role development for RTTs in Ghana and other countries with a similar situation.

Treatment review and assessment clinics

Reports from the CoR, (2002), confirms that RTTs in radiation oncology in many developed countries are involved in leading treatment reviews, assessment clinics and even prescribe medication for treatment related conditions, for example, skin reactions and nausea. According to their reports, the service is well liked by patients and helps provide a beneficial approach to patient care (CoR, 2002).

Site specialization

Another new role that has been introduced is RTTs operating autonomously as site specialists. A site specialist leads a care team and amongst other roles also organizes and plans palliative care for their own patients (CoR, 2002). A specialist in palliative care focuses on the management of pain and its related symptoms (Faithfull and Wells, 2003). Examples are Gynaecology, Neurology and Breast site specialists (Hornsby & Fletcher, 2008)

Counselling

In recent years, RTTs have developed an important role in counselling of their patients undergoing treatment (CoR, 2002). This role has progressed very fast in the profession through education such that it is no longer seen as role development in many countries but as a normal part of the RTT's role (CoR, 2003a). For a country like Ghana, counselling is seen as role extension for RTTs since officially counselling is done by doctors.

Research and trial co-ordinators

Research RTTs are engaged as independent professionals committed entirely to research in radiation oncology (CoR, 2003a). Their duty includes developing a research design and publication of project work which include clinical trials and research of work where they serve as coordinators (CoR, 2002).

Conformal radiotherapy

The introduction of 3-Dimensional conformal radiotherapy, has led to RTTs being involved in the operation of highly sophisticated equipment within the radiation oncology team (CoR, 2002).

Palliative care

Another area where RTTs have extended their role is in palliative care. The role of the RTTs in this area is to perform pre-treatment work, like simulation for field placements and prescribing of radiation doses to protocol which were previously roles of the ROs (CoR, 2002).

Dedicated liaison

Liaison RTTs are dedicated to the role of taking the responsibility for supporting patients throughout treatment, organising appointments and coordinating across different departments. They are also involved in discussions with the patients at the start, during and at completion of treatment and play an important role in their review clinics (CoR, 2002).

Quality assurance

Quality assurance has become an important area in radiation oncology due to the nature of technology advancement and the quest for accurate delivery of treatment (CoR, 2003a). The move to formal quality accreditation of services in the UK, has allowed many hospitals to employ a quality assurance co-ordinator or manager, a role now normally taken by RTTs (CoR, 2002).

2.4 Barriers to role extension in radiography

2.4.1 Introduction

Barriers to role extension differ from one department to the other. In some departments there is resistance to a specific area of radiography activity but there can also be more a generalised and hostile environment in other places. A study conducted in UK in 2008 on the scope of radiographic practise revealed some barriers to introducing extended roles such as; lack of support by radiologists, limited funding, restricted training opportunities, unenthusiastic radiographers and poor staffing levels (Society and College of Radiographers, 2008). In the same study, the barriers were categorized into those within the profession of radiography itself, inter-professional barriers, management and government level issues and barriers within training and education (Society and College of Radiographers, 2008). In this section these barriers will be discussed.

2.4.2 Specialist doctors as a barrier

A major barrier identified by many radiographers both in the UK and in the US is specialist doctors such as the radiologist (Price & Le Masurier, 2007; Price, High, & Miller 1997).

In the study, it was reported that some of the radiologists disapproved reported films by radiographers, showed no interest in overseeing radiographers and demonstrated resistance to radiographers training in reporting, especially to CT reporting. For example, some radiologists noted that new roles were not required for radiographers and others gave excuses that they were occupied in the training of junior doctors and had no time to help in the training of radiographers (Society and College of Radiographers, 2008).

2.4.3 Funding

Another barrier noted by the Society and College of Radiographer (2008) in the study was the reluctance of management to support staff with funds for studies or activities towards role extension. In one instance they reported there was lack of flexibility in releasing funds from the management (Society and College of Radiographers, 2008).

2.4.4 Staffing

The study also reported a shortage of radiographers in some departments as hindering the progress towards extended roles (Society and College of Radiographers, 2008).

2.4.5 Attitudes

The attitudes of some radiographers such as lack of passion and interest for the profession, lack of motivation, lack of vision and resistance to change have been identified as barriers towards role development in the profession (Society and College of Radiographers, 2008). For example, it was reported by the Society and College of Radiographers, (2008) that the attitudes of some individuals in the profession did not readily encourage role development. A typical argument raised by one respondent was that there is a difference in attitude between radiographers and nurses and that if you were to offer staff development for an advanced practitioner role to a nurse they would jump at the opportunity, but a radiographer would first consider the benefits and disadvantages and give excuses for not taking up the opportunity (Society and College of Radiographers, 2008).

Another respondent stated that he had to advertise positions externally since it did not appeal to any of the internal staff. Some respondents also described how the nature of the radiation therapy department could result in individuals being isolated resulting in less peer support thereby restricting research and skill development and impeding the

individual from having drive towards role expansion (Society and College of Radiographers, 2008).

2.4.6 Management and government level barriers

Several barriers identified through the study related to the management and the government. These included lack of resources and equipment, pressure on staff (Society and College of Radiographers, 2008) and the remoteness of some radiation oncology and cancer centres which hindered interested staff from taking advantage (Price & Le Masurier, 2007).

2.4.7 Training and educational barriers

The final area identified as barriers to role development in radiography was within training and education. Training and educational barriers comprises of the lack of resources, lack of effective leadership and lack of a professional research base (Kelly, Piper & Nightingale, 2008).

Lack of resources

Studies show that radiography professionals are disadvantaged compared to other professionals when it comes to the provision of Continuous Professional Development (CPD) (Read, Jones, Doyal & Vaughan, 2001; Henwood & Benwell, 1998). Resources such as journals, books and human resources which are key requirements that facilitate role development within the clinical environment limit role development (Kelly, Piper & Nightingale, 2008). Radiographers attempting to advance their role indicated the need to raise their own funds for this (Williams, 2003; Kelly & Hogg, 2005).

Lack of effective leadership

Much of the literature pertaining to role extension stresses the importance of the need for trainers to demonstrate effective clinical and professional leadership in order to motivate and inspire others (Society and College of Radiographers, 2005; Snaith & Hardy, 2007; Nightingale & Hogg, 2003). Trainers are mostly clinical experts but their role may also include management as well as research and education (CoR, 2003c).

Leadership training, in preparation for their role extension, has not been a priority for radiographers though evidence shows that adequate leadership is necessary for role advancement (Kelly, Piper & Nightingale, 2008).

Lack of a professional research base

Studies have shown that although research has been stressed as important to a profession, and radiographers have been encouraged to engage in research activities, the radiography profession has still not developed a strong research base (Adams & Smith, 2003; Williams, 2002). Kelly *et al*, (2008) stated that had radiography been built on a strong research base, the radiographers would have been better placed to gain the respect of the medical profession and advance role development more effectively.

Hence, research deficits in radiography may restrict career progression and the chance to improve patient services (Snaith & Hardy, 2007). Several efforts have been made by The Society and College of Radiographers to bridge this gap including the establishment of a research group to actively support research amongst its members (CoR, 2005c). Also, in the UK, it is mandatory as a consultant radiographer to contribute to research (Department of Health, 2001).

2.5 Training and Education for role development

The introduction of extended roles in radiography has called for the attainment of advanced clinical skills and competencies in the profession (Ruchmer & Pallis, 2002). In an article on the Role Extension for the Radiographer in the New Millennium held in Uganda, three R's were identified as steps in Role Extension for Radiographers (Kawooya, 2008).

The first 'R' represents Research or Re-evaluate. The aim of this re-evaluation is to identify whether patient's needs are being met or not and if they are being met, how efficiently. This will involve researching the skills and knowledge base of staff and building on them to provide better services for the future.

The second 'R' represents Re-structuring of existing policies and Re-organization of standards in the profession. According to Kawooya, (2008) re-structuring will result in the definition of new evidence-based roles for the radiographer in the new millennium.

The final ‘R’ is Re-training of radiographers in the profession. By continuous education and training, radiographers would be able to take up new roles that are identified for them. According to CoR, (2005b), re-training may be achieved by supporting the radiographic workforce in skills development.

A survey was conducted in Canada among 102 RTTs on Needs Assessment towards the development of new roles through education and training (Cancer Care Nova Scotia, 2004). This has been summarized in table 2.1.

Table 2.1 Topics considered by RTTs for continuous education and training (n=77) (Cancer Care Nova Scotia, 2004).

Topic	% RTTs who rated it “very important”
Radiation techniques (new/standard/current)	99%
Management of treatment side effect	79%
Pain management	69%
Supportive and palliative care	64%
Chemotherapy	60%
Clinical trials and research	49%
Medication (knowledge, administration, counselling)	47%
Diet and cancer	47%
Multi-disciplinary team	47%
Hormone therapy	45%
Supportive therapies	24%
Patho-physiology of cancer	23%

2.6 Supporting role development

The researcher could identify methods that are considered helpful in supporting role development in radiography (CoR, 2004; Orhling & Hallberg, 2001). These are preceptorship, clinical supervision and continuous professional development.

2.6.1 Preceptorship:

The term preceptor was derived from a Latin noun *praeceptor* which means ‘teacher or instructor’ (Klein 1971). A preceptor is an experienced and competent role model with good communication skills, knowledge in their field of expertise and who is able to facilitate the process of learning (Knight, 2001). A preceptor has the ability to teach and offer learning opportunities as well as assess individual’s practice and give them feedback on their performance (Nisbet, 2008; Billay & Yonge, 2004).

The College of Radiography (2004), defined preceptorship as a short-term process of support and guidance offered to an individual during the first months of a new or significantly different role. Other authors in a related journal defined preceptorship as the linking of theory and practice in order to boost confidence in an individual (Orhling & Hallberg, 2001).

Similarly, Kaviani & Stillwell (2000) stated that preceptorship will enable newly qualified practitioners to merge their knowledge and reflect on their practice, thus promoting independence and clinical proficiency. The purpose of preceptorship according to Kaviani & Stillwell (2000) is to integrate, support and assist the development of professional competence among individuals. Preceptorship can be usefully applied to support staff throughout their career framework (Department of Health, 2003).

2.6.2 Clinical supervision

Clinical supervision refers to a formal and structured process of professional support which aims to assist individuals to understand clinical practice in order to gain new insights in the development of their new knowledge and skills (Clinical Supervision Guidelines, 2005). Through clinical supervision, individuals can benefit from peer support, review and guidance directed towards maintaining and developing the individual’s excellence and independence in a particular role (CoR, 2003c).

2.6.3 Continuing professional development (CPD)

CPD can be defined as the conscious updating of professional knowledge and the improvement of professional competence throughout a person's working life (Department of Health, 2000). CPD can also be defined as a lifelong process of continuous learning arising from structured reflection on current practice (CoR, 2003c). According to the College of Radiographers (2003c), there is a professional requirement for all radiographers to maintain competence to practice. A study to investigate the importance of CPD in twelve countries in Europe revealed that CPD was important to most radiographers, although many longer qualified radiographers found CPD to be less necessary (Marshall, Punys & Sykes, 2008).

2.7 Potential beneficiary of role development

Patients

1. Role development in radiography will enhance the quality of care to patients whenever they need it (National Health Service, 2006)
2. It will bring reduction to patients waiting times, increase faster diagnosis and delivery of treatment for patients (National Health Service, 2006)
3. Role extension will further increase acknowledgment of the importance of patient and public involvement in the future provision of healthcare (National Health Service, 2006)
4. Communication will be improved with role extension (National Health Service, 2006)

Staff (Radiographer)

1. Role extension gives recognition of the role of radiographers and their career development (National Health Service, 2006).
2. With role development future recruitment and retention of radiographers can be achieved (National Health Service, 2006).
3. It increases motivation for radiographers due to recognition and support of the need for their future education and career pathways (National Health Service, 2006).
4. It can further reduce vacancies and staff turn-over (National Health Service, 2006).

5. Finally it raises awareness, understanding of the benefits and implications of the career progression framework staff (National Health Service, 2006).

2.8 Conclusion

The consideration of role development among RTTs leads to the next chapter on pain. Pain is a symptom experienced by many cancer patients regardless of disease stage and patients may benefit if RTTs acquire the necessary skills and conduct the assessment of pain as a role extension activity.

CHAPTER THREE

LITERATURE REVIEW: PAIN

3.1 Introduction

This chapter looks at pain in general and its symptoms which affect a significant number of patients with advanced cancer yet may also be generated as a side effect of radiotherapy. There is a focus on cancer pain and its management with methods of treatment of cancer pain through thorough assessment followed by a description of various tools used for the assessment of pain. The chapter concludes with a discussion of barriers encountered in the management of pain.

3.2 Definition of pain

Aristotle (Aristotle-Wikipedia, 2009), believed that pain was an emotion. Evidence suggests that people still believe that pain is primarily an emotional reaction that can be conquered by will power (Funk, Torngquist, Champagne, Copp & Wiese, 1994). In the Middle Ages, pain was viewed as possession by demons, punishment for sins, the will of God and even as moral weakness (Kilwein, 1983). Pain is universal, complex in nature and usually accompanied by defensive mechanisms which signal a response, such as removing a finger from a hot stove (Doctor for Pain, 2008).

The International Association of the Study of Pain (IASP) defines pain as "an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage (Merskey & Bogduk, 1994). Other definitions of pain include;

- Any sensation, physical and emotional, that hurts (American Cancer Society, 2007).
- What the experiencing person says it is, existing whenever he says it does (Cancer-Pain, 2002).

Pain is a subjective phenomenon and not simply a physical experience but the physical experience and the patient's interpretation of that experience, taking into account personality, mood, understanding, past experiences and social relations (Sugden, 2001).

3.3 The Nature of Pain

Pain affects all aspects of quality of life and in cancer patients pain becomes more persistent as the disease progresses, affecting almost 88% of patients with advanced disease. For these patients, controlling the pain and managing the symptoms are important goals of treatment (Zech, *et al.*, 1995). The causes of pain can be from the disease itself, as a result of the treatment and at times is unrelated to the disease (Alexander & Payne, 2007).

Albert Schweitzer, the great humanitarian and physician in the 1980s, elegantly described in two sentences, the nature of pain, and the obligation and the privilege, of the doctor to relieve it, when he said: "We must all die; but that I can save him from days of torture, that is what I feel is my great ever-new privilege" (Doctor for Pain, 2008). Pain is seen by many people as a more terrible condition than even death itself (Baker, Doralina, Anghelescu & Kane, 2008).

Opinions of some researchers indicate differences in the experience of pain among men and women (McCaffery & Ferrell, 1992; Bendelow, 1993). Several studies suggest that females are more vulnerable to pain than men (Hamzat, 2007; GiveUpAlready, 2004; Berkley, 1997). Reasons for such discrepancies are given as;

- 1) The menstrual phase and reproductive status of women making them more susceptible to pain (Procacci, 1993),
- 2) Women have less tolerance for intense stimuli compared to men (Fillingim & Maixner, 1995) and
- 3) The presence of some disease conditions being higher in women as against men (Giamberardino, Berkley, Iezzi, deBigontina, & Vecchiet, 1995).

Pain is described as either acute or chronic (Chronic Pain Support Group, 2009) and is probably the most frequent cause of suffering and disability in people throughout the world (Back Pain Symptoms, 2009). Studies suggest that in the United States, between 15 and 20% of the population have acute pain and between 25 and 30% have chronic pain annually (Doctor for Pain, 2008).

3.3.1 Acute pain

Acute pain refers to pain that has a short duration and usually disappears when the injury heals (National Comprehensive Cancer Network, 2005). The cause of acute

pain is usually known and can be something such as an activity causing pain (National Comprehensive Cancer Network, 2005). Acute pain generally has a sudden onset, usually responds to treatment with analgesic drug therapy and treatment of the cause of the pain (Leaver, 2002). The body is usually able to restore and repair itself after acute pain (Wells, 2003).

3.3.2 Chronic pain

Chronic pain refers to pain ranging from mild to severe and lasting for a longer period even after three months with a less defined onset (Leaver, 2002). Common causes of chronic pain may be damage to nerve fibers; a disease such as herpes zoster; trauma such as injury, surgery, or even amputation (Doctor for Pain, 2008). It can however occur without a known disease or injury (Leaver, 2002).

American Cancer Society (2007) describes chronic pain in two categories; persistent pain and breakthrough pain. Persistent pain is defined as pain which is continuous and last for a long time (American Cancer Society, 2007). Breakthrough pain is a brief flare-up of severe pain that comes on rapidly and sometimes occurs while the patient is taking pain medication (American Cancer Society, 2007). Breakthrough pain frequently occurs unexpectedly for a few minutes to an hour, without a preceding incident or clear cause (Cancer Pain, 2009). It is usually treated with strong, short-acting pain medication (National Comprehensive Cancer Network, 2005).

3.4 Types of pain

Pain can be classified as visceral, somatic, and neuropathic (American Cancer Society, 2007).

3.4.1 Visceral pain

Viscera are internal organs contained in a cavity of the body, like the thorax, abdomen and pelvis. Visceral pain is therefore pain felt in internal organs caused by tissue damage or activation of pain receptors as a result of an infiltration of tumour putting pressure on one or more of the organs (compression), a stretching of the viscera, or a general invasion of cancer (Fayed, 2009; Health Communities, 2007). Common causes of visceral pain in patients with malignant disease include those with

pancreatic cancer and metastases in the abdomen (Cancer Pain, 2009). It can be described as gnawing, cramping, aching, or sharp (Health Communities, 2007).

3.4.2 Somatic pain

Somatic pain is pain felt in a specific area especially on the skin and muscle, or in the bone. It is caused by the activation of pain receptors in either the cutaneous or deep tissues (National Comprehensive Cancer Network, 2005). When it occurs in the musculoskeletal tissues, it is called deep somatic pain (Cancer Pain, 2009). A common cause of deep somatic pain is pain from bone metastases (Health Communities, 2007). Somatic pain can be described as stabbing, aching, throbbing, or pressure (Swierzewski, 2007).

3.4.3 Neuropathic pain

Neuropathic pain as referred to as nerve injury is caused by injury to, or compression of, the structures of the peripheral or central nervous system (Swierzewski, 2007). It is often described as sharp, tingling, burning, or shooting (Kazanowski & Laccetti, 2002).

3.5 Cancer Pain

According to World Health Organization (WHO), (2005) pain experience must be viewed as physical, social, psychological and spiritual and it is vital that the assessment and management of pain in patients undergoing radiotherapy incorporate all the factors. Cancer pain can therefore be best understood when described as multidimensional, with affective, cognitive, behavioural and physiological-sensory dimensions (Funk, *et al.*, 1994).

Studies show that the prevalence of pain in cancer patients ranges from 52-80% (Millar, Carroll, Grimshaw & Watt, 1998; Addington- Hall & McCarthy, 1995; Hockley, Dunlop & Davies, 1988). A recent publication suggests that there is a prevalence of pain in 64% of patients with advanced cancer and in 33% of patients undergoing curative treatment (Van den Beuken-van Everdingen, de Rijke, Kessels, Schouten, van Kleef, & Patijn, 2007).

The nature of cancer pain calls for input and management from a multi-professional team to best meet the needs of patients with cancer pain (Scottish Intercollegiate Guidelines Network, 2000).

3.6 Types of cancer pain

One classification separates cancer pain into nerve pain, bone pain, soft tissue pain and phantom pain (Cancer Research UK, 2007).

3.6.1 Nerve pain

Nerve pain is an example of *Neuropathic pain* and is caused by pressure on nerves or the spinal cord, or by damage to nerves (HealthHype, 2009). Nerve pain is often felt in a particular place or along the path of a nerve and is not usually widespread (Fayed, 2009). This pain is often described as burning or as a feeling of something crawling under the skin (Cancer Research UK, 2007).

3.6.2 Bone pain

Bone pain is an example of *Somatic pain* and can affect one specific area or several areas, depending on how much the cancer has spread (Cancer Research UK, 2007). Bone pain is very common in patients with breast, prostate or lung cancer. The cancer spreads to the bone, and it is the growth of the cancer within the bone that damages the bone tissue and causes the pain (National Comprehensive Cancer Network, 2005). It is often described as aching, dull or throbbing (Cancer Research UK, 2007).

3.6.3 Soft tissue pain

Soft tissue pain is a type of *visceral pain* which results from a body organ or muscle usually described as sharp, aching or throbbing (Cancer Research UK, 2007).

3.6.4 Phantom pain

Phantom pain may be felt by patients who have had a limb amputated due to a sarcoma (Kooijman, Dijkstra, Geertzen, Elzinga & van der Schans, 2000). This type of cancer pain can be severe and patients sometimes describe it as unbearable. Researchers are still trying to understand why phantom pain happens. One theory states that the 'thinking part' of the human brain knows that part of the body has been removed but the 'feeling part' of the brain cannot understand this (Halligan, 2002).

There is even a thought that phantom pain can result from surgery done by an inexperienced surgeon (Cancer Research UK, 2007).

Between 60 - 70% of people who have had an arm or leg removed feel phantom pain and about one third of women who have had mastectomy for breast cancer feel phantom breast pain (Cancer Research UK, 2007). Possible stimuli for phantom pain are changes in the air pressure or temperature, stress, poor posture and other illnesses such as flu and infections (Cancer Research UK, 2007).

3.7 Cancer Pain Syndromes

Researchers have defined several cancer pains and have called them syndromes based on the causes of cancer pain which include pain from tumour, pain related to the treatment (radiation therapy and chemotherapy) and pain that has nothing to do with the disease (McCoy, 2008). These syndromes include abdominal pain, mucositis and bone metastases.

3.7.1 Abdominal Pain

Abdominal pain in cancer patients occurs as a result of tumour of the small or large intestine which are frequently characterized by pain that is colicky, worse after eating, and associated with nausea (Marks & Lee, 2009).

3.7.2 Mucositis

Mucositis can occur in any patient receiving cytotoxic chemotherapy or radiation to the head and neck (Sutherland & Browman, 2001). Radiation of the oropharyngeal and oesophageal mucosa results in inflammatory effects, usually appearing at the end of the second week of treatment, increasing during the fourth week of radiation, and sometimes persisting for 2 to 3 weeks after the completion of treatment (Faithfull & Wells, 2003). In both chemotherapy and radiation-induced mucositis the intensity of the pain is related to the extent of tissue damage and the amount of inflammation (Wells, 2003). The patient often describes it as a burning sensation, often accompanied by erythema (Wells, 2003).

3.7.3 Bone Metastases

Tumour involvement of bone is the most common cause of cancer pain (Bajwa & Warfield, 2009) and the presence of pain due to bone metastases has an important

negative impact on quality of life (Rustoen, Moum, Padilla, Paul & Miaskowski, 2005). Multiple myeloma and cancers of the breast, prostate, and lung account for the large majority of bone metastases (Portenoy, 1989). The most common sites of bone metastases are the vertebrae, pelvis, femur, and skull (BC Advisor, 2007) while distal extremity metastases are uncommon (Bajwa & Warfield, 2009). Pain is usually described as dull and aching, localized to the area of metastases and is increased by movement (Payne, 1989).

3.8 Pain as a consequence of radiation therapy

Patients undergoing radiation therapy do not always report pain associated with treatment (Wells, 2003). When they have pain associated with acute effects of radiation, it tends to be worse towards the end of treatment and resolves within a few weeks after treatment, whereas when pain arises as a late effect, it occurs sometimes months or even years after treatment (Wells, 1995).

3.8.1 Radiation therapy to head and neck

Radiotherapy to the head and neck is known to cause severe side effects such as mucositis and dysphasia as acute pain and severe pain such as pain from osteoradionecrosis as a late effect (Whale, Lyne & Papanikolaou, 2001). Epstein & Stewart (1993) used a detailed pain questionnaire to assess pain in 34 patients with oropharyngeal cancer undergoing radiation therapy and discovered that; 82% of patients experienced pain prior to the beginning of treatment and by the middle of treatment, 100% of the patients were experiencing pain, that some described as “horrible” and “distressing”. The authors found that the medications used did not eliminate the pain completely. In addition, they highlighted the fact that the evidence of pain in the head and neck is magnified due to the impact it has on psychosocial interaction. A similar study concluded that radiation-induced mucositis is not the only cause of pain during radiation therapy and that patients also experience musculoskeletal and neuralgic pain (Khoo, 2003).

3.8.2 Radiation therapy to the thorax

Radiation therapy to thorax (lung, breast or oesophagus) can cause eosophagitis and difficulty in swallowing (Wells, 1998), breast swelling and even brachial plexus (Pierce, Recht & Lingos, 1992). Munro & Potter (1996) conducted a study of

symptom distress in 110 radiotherapy patients and found that breast patients experienced a reduction in arm numbness during radiation therapy but an increase in breast pain and heaviness of the breast over time. They also identified that patients with lung cancer experienced an improvement in the level of their pain after radiotherapy.

A similar study of the experience of breast cancer patients having radiation treatment confirmed that 20% of patients began treatment with pain but that this increased to 49% at the end of treatment, with 8% having severe pain (Wengstrom, Haggmark, Strander & Forsberg, 2000). Pain such as radiation pneumonitis, fibrosis and pleural pain from radiation-induced changes to pleura in lung cancer patients are late effects of radiation therapy (Khoo, 2003).

3.8.3 Radiation therapy to the abdomen

Radiation therapy to the abdomen can generate pain and discomfort such as abdominal cramps, nausea and vomiting (Faithfull, 2003). Pelvis irradiation can also cause pain from abdominal cramps, diarrhoea and cystitis (White, 2002).

3.8.4 Radiation therapy to any other sites

Radiation therapy can lead to pain in any site. Examples are pain from erythema, desquamation, itching and burning due to radiation effects (Campbell & Illingworth, 1992).

3.9 Management of cancer pain

The management of cancer pain requires a multidisciplinary approach to give the optimum outcome for the patient (Scottish Intercollegiate Guidelines Network, 2000). Health professionals involved may include ROs, RTTs, anaesthetists, surgeons, physiotherapists, occupational therapists, nurses, pharmacists, clinical psychologists and palliative care specialists. A study of the effectiveness of a pain management intervention for patients with cancer pain demonstrated that giving cancer patients an active role in their pain management had a beneficial effect on patients' pain experience (De Wit, van Dam, Zandbelt, van Buuren, van der Heijden, *et al.*, 1997).

The nature of cancer pain requires repeated assessment because cancer pain can emerge rapidly as the disease progresses (Cleary, 2000). Patients with cancer pain

experience multiple concurrent symptoms; hence effective pain management depends on the ability to assess the characteristics of the pain and the causes, whether it is related to the progression of disease, a new cause of pain, or the cancer treatment (National Cancer Institute, 2009). An accurate and a complete assessment of pain are essential to determine the best method of treatment for optimal quality of life (AboutKidsHealth, 2009).

3.10 Assessment of cancer pain

3.10.1 Introduction

Effective pain assessment serves two important purposes to the radiation oncology team; first, because pain can be a symptom of disease, pain assessment may be used to identify changes in the progression of cancer (for example to signal metastasis or complications). Secondly, because pain can be distressing and can have a profound impact on functioning; pain assessment can be used to track possible changes in the quality of life (Chapman & Gavrin, 1999). Pain assessment needs to occur at regular intervals throughout treatment and with any new report of pain (Wells, 2003).

Complete assessment of pain, requires consideration of the following domains; Physical effects and manifestations of pain (Twycross, Harcourt & Bergl, 1996) and functional effects such as interference with activities of daily living (Serlin, Mendoza, Nakamura, Edwards & Cleeland, 1995). An accurate and detailed history of the pain must be taken during assessment, including an account of all factors that worsen or lessen the pain as well as its duration, timing, severity and type (Scottish Intercollegiate Guidelines Network, 2000). Patients should be given the opportunity to express in any language and terms problems related to their pain (Scottish Intercollegiate Guidelines Network, 2000). Assessment of patient's beliefs, anxiety, mood, culture and reaction to the pain must also be taken into consideration during this process (Wells, 2003).

Simple visual or Likert scales are very useful tools for assessment of pain, however tools selected for assessment of cancer pain should measure the intensity of pain, relief of pain and psychological distress associated with pain (Scottish Intercollegiate Guidelines Network, 2000).

3.10.2 Methods for assessment of pain

Complete assessment of pain is achieved by considering elements comprising of the history of the pain, physical examination and investigation of the pain with the use of a standardized assessment tools (Grond, Zech, Diefenbach, Radbruch & Lehmann, 1996).

History: Full history taking is vital to comprehensive assessment. The person doing the assessment must listen carefully to the patient and determine the number of site of pain, severity of pain, radiation of pain, duration of pain, factors that increase or decrease pain, aetiology of pain, type of pain and any previous treatment (Grond, *et al.*, 1996).

Physical examination: Physical examination of cancer pain should be carried out which aims at reaching a conclusion on the exact cause of pain and establishing best effective treatment (Grond, *et al.*, 1996).

Investigations: Evaluation of cancer pain should be restricted to what is likely to impact on patient management. Unnecessary disturbance of patients near to the end of life must be avoided and only relevant investigations that will significantly influence the management should be performed (Grond, *et al.* 1996).

In the next two pages a summary of literature on pain assessment questionnaires and their applications, previously used by other authors, are discussed. Please refer to Tables 3.1 and 3.2.

Table 3.1 Pain assessment questionnaires and their applications

Memorial Pain Assessment Card (Fishman, Pasternak, Wallenstein, Houde, Holland & Foley, 1987)	A simple, rapidly completed questionnaire which measures intensity, relief of pain, and psychological distress.
Wisconsin Brief Pain Inventory (Cleeland, Gonin, Hatfield, Edmonson, Blum, <i>et al.</i> , 1994).	Measures intensity and relief of pain, psychological distress, and functional impairment. A valid and reliably tested tool used in research studies.
McGill Pain Questionnaire (MPQ) (Melzack, 1993) and Short-Form McGill Pain Questionnaire (SF-MPQ-2) (Melzack, 2009)	One of the first pain assessment tools, which revolutionized assessment. It allows quantification of distinct components of the subjective pain experience (Melzack, 1993). A shortened version and a simpler version now used in research (Melzack, 2009).
The Dallas Pain Questionnaire (DPQ) (Lawlis, Cuencas, Selby & McCoy, 1989)	A 16-item questionnaire used for the purpose of evaluating subject's cognition aspects in patients with low back pain.

Table 3.2 Simpler tools for assessment of pain and their applications

Numerical Rating Scale (NRS)	The patient rates pain on a scale from 0 to 10 (Mann, Kimber, Diggins, Jenkins, Vandenburg & Currie, 1984).
Visual Analogue Score (VAS)	The patient indicates intensity of pain on a 10 cm line marked from "no pain" at one end to "severe pain" at the other end (Collins, Moore & McQuay, 1997).
Verbal Rating Scale (VRS)	The patient rates the pain verbally (Jensen, Karoly & Harris, 1991).
Behaviour Rating Scale (BRS)	Patients rate the severity of their pain in terms of the degree to which it interferes with concentration and the performance of everyday tasks (Jensen, <i>et al</i> , 1991).
Picture Scale	The Picture Scale employs eight line drawings that illustrate facial expressions of persons supposedly experiencing different levels of pain intensity (Jensen, <i>et al</i> , 1991). Patients indicate which one of the eight expressions best represents their pain experience.
Descriptor Differential Scale (DDS),	A self-report measure of pain intensity (Gracely & Kwilosz, 1988). Consists of 12 adjectives describing different levels of pain intensity and patients rate the intensity of their pain as either more or less than each word given them (Jensen, <i>et al</i> , 1991).

3.11 Who should assess pain?

According to Ferrier (2006), healthcare professionals all over the world have been very committed to the management of acute and chronic pain. Increasingly, healthcare professionals are not simply focusing on prolonging a patient's life but also improving the quality of life for each patient (Lets talk pain, 2008).

As radiographers have increased their contribution to patient care, assessment of pain in patients may impact how treatment is delivered (Ross, 2000). Currently, radiographers are providing initial comments on radiographs and treatment plans of patients as previously discussed in chapter three. Assessment of patients' pain as an extension of their role may further support patient management (Ross, 2000).

In order to establish whether pain assessment is a role of RTTs elsewhere, a literature search was conducted. EBSCO HOST, Science Direct, Pro Quest, Medline and Cinahl were searched using the following keywords: pain assessment, RTT, role and role extension. There was insufficient evidence to draw any conclusions regarding pain assessment by the RTTs and no publications were found. However, some information gathered on the duties of RTTs in the US and a training course for student RTTs in the UK indicated that pain assessment and management was a role of RTTs.

At the Radiation Oncology Unit of the Louisiana State University Health Science Centre (LSUHSC) in the US, assessment of patient's pain on initial consultation prior to radiotherapy is done by a nurse and findings are forwarded to a physician for appropriate management. Weekly and daily assessment of patient's pain and any other side effects during the course of treatment are performed by the RTTs and results are documented in the patient's folder before referring patients to a physician (Louisiana State University Health Science Centre, 2004).

Also, at the Robert Gordon University in the UK, registered RTT students are expected to undergo training on the physiology and the management of pain as part of the University's approved module for the training of RTTs (Robert Gordon University, 2010).

Health professionals have been shown to underestimate the level of pain a patient is experiencing, and this discrepancy between estimations widens as the pain increases

in severity (Grossman, Sheidler, Swedeen, Mucenski, & Piantadosi, 1991; Field, 1996). On the other hand, family members and close relatives of the patients tend to overestimate pain in their relatives (Elliott, Elliott, Murray, Braun & Johnson, 1996). The patient, if competent and able to communicate, is the most reliable assessor of pain and should, where possible, be the prime assessor of his or her own pain (Cleeland, *et al.*, 1994).

Involving the patient closely in the assessment will encourage the development of trust and enhance the probability of successful pain control. In patients with communication difficulties, such as those suffering from dysphasia, careful consideration should be given to assessment by lay caregivers such as family relatives (Scottish Intercollegiate Guidelines Network, 2000).

Assessment of pain in patients is therefore a multidisciplinary approach and should consequently include all disciplines involved in the management of the patient including the patients themselves as well as relatives when necessary. Clear assessment and documentation is critical to maintaining good patient-professional communication (Lets talk pain, 2008).

3.12 Methods for treatment of Pain

Several methods are used for the treatment of pain. In this study, methods relating to the treatment of cancer pain have been described. These are medications, radiation therapy, surgery, physical therapy, psychosocial and other supportive therapies like pastoral and traditional medicine.

3.12.1 Medication

The World Health Organization (WHO) has developed a three-step strategy to guide clinicians in the management of cancer pain (WHO, 1996).

- Step 1 (Mild) - use non-opioid agent (24-hour coverage with acetaminophen, aspirin or other non-steroidal anti-inflammatory drug (NSAID), with or without adjuvant.
- Step 2 (Mild to moderate) – use weak opioid (for example, codeine, oxycodone) plus non-opioid agent, with or without adjuvant

- Step 3 (Moderate to severe) Strong opioid (e.g., morphine, hydromorphone, fentanyl), with or without non-opioid agent or adjuvant.

A study on the effectiveness of the commonly used drugs by WHO shows that acetaminophen and non-steroidal Anti-Inflammatory drugs (NSAIDs) relieve pain caused by muscle aches and stiffness, but only NSAIDs are beneficial in treating acute pain and can also reduce inflammation (swelling and irritation) (Hartmann, Zahasky & Grendahl, 2000). NSAIDs relieve pain by reducing the production of prostaglandins, which are hormone-like substances that cause pain. Acetaminophen works on the part of the brain that receives the “pain messages” (Hartmann, *et al.*, 2000).

Opioids are often used for acute pain, such as short-term pain after surgery. They are effective for severe pain and it is rare for people to become addicted to these drugs if they are used to treat pain for a short period of time (Ambrosio, Paoletti, Savoia, Amantea, Arcuri & Avogaro, 2003). Side effects of opioids may include: drowsiness, nausea, constipation, itching and breathing problems (Web MD, 2009).

In the next paragraph the most common drugs used in the management of pain are presented. Please refer to Table 3.3

Table 3.3 Most commonly used drugs in the management of pain (Doctor for Pain, 2008)

GROUP	DRUGS
Acetaminophen	Acetaminophen (Tylenol)
Non-Steroidal Anti-Inflammatory Drugs	Diclofenac (Cataflam, Voltaren), Etodolac (Lodine) Ibuprofen (Advil, Motrin, Nuprin), Indomethacin (Indocin), Naproxen (Anaprox, Naprosyn), Piroxicam (Feldene), Tolmetin (Tolectin)
Salicylates	Aspirin, Salsalate (Disalcid, Mono-Gesic, Salflex, Salgesic, Salsitab)
Narcotic Analgesics	Codeine Fentanyl Topical (Duragesic), Meperidine (Demerol) Morphine (Kadian, MS Contin, Oramorph, Roxanol) Oxycodone (OxyContin, Oxyir, Percolone, Roxicodone) Propoxyphene (Darvon), Tramadol (Ultram)
Narcotic Combinations	Acetaminophen and Codeine (Tylenol with Codeine) Acetaminophen and Hydrocodone (Lorcet, Lortab, Norco, Vicodin, Zydone) Acetaminophen and Oxycodone (Endocet, Percocet, Roxicet, Tylox) Acetaminophen and Propoxyphene (Darvocet, Wygesic) Acetaminophen and Tramadol (Ultracet), Acetaminophen / Butalbital / Caffeine (Fioricet), Aspirin and Codeine (Empirin with Codeine) Aspirin and Hydrocodone (Panasal), Aspirin and Oxycodone (Endodan, Percodan, Roxiprin), Aspirin / Butalbital / Caffeine (Fiorinal)

Tricyclic Antidepressants	Amitriptyline (Elavil, Endep, Vanatrip), Amoxapine (Asendin), Clomipramine (Anafranil), Desipramine (Norpramin), Doxepin (Adapin, Sinequan), Imipramine (Tofranil), Nortriptyline (Aventyl)
Antihistamines	Hydroxyzine (Atarax, Rezone, Vistaril)
Anticonvulsants	Carbamazepine (Carbatrol, Epitol, Tegretol), Clonazepam (Klonopin), Neurontin (Gabapentin), Phenytoin (Dilantin), Valproic Acid (Depakene)
Muscle Relaxants	Baclofen (Lioresal), Carisoprodol (Soma, Vanadom), Chlorzoxazone (Paraflex, Relaxazone, Remular), Cyclobenzaprine (Flexeril), Methocarbamol (Robaxin), Orphenadrine (Norflex)
Corticosteroids	Dexamethasone, Prednisone
Neuroleptics	Fluphenazine (Permitil, Prolixin), Haloperidol (Haldol)
Local Anaesthetics	Mexiletine (Mexitil)

3.12.2 Radiation therapy

Radiation therapy is very useful for relieving pain especially bone pain and this has been well established with techniques which include single-field administration, hemibody irradiation or radioisotopes (Wells, 2003). Two main mechanisms are cited to describe how radiotherapy relieves pain (Mercadante, 1997):

1. The cytotoxic effect of radiotherapy on normal cells prevents the release of chemical mediators of pain such as prostaglandins. This effect explains the

fact that some patients get rapid pain relief, often within 24hour of their treatment.

2. The cytotoxic effect of radiotherapy on tumour cells prevents the release of any further bone destruction and reduces the size of the tumour. This effect explains the pain relief obtained between 2-8 weeks after radiotherapy.

Radiotherapy techniques

Wells, (2003) review of 13 published trials of radiotherapy for bone pain showed that 42% of patients can expect 50% or more pain relief from radiotherapy. Several techniques are used in radiotherapy such as a *single fraction*, *multiple fractions* given in different fractions schedules and *continuous hyperfractionated accelerated radiotherapy* (CHART) where patients with pain receive more than a single fraction a day within an interval of 6 hours (Wells, 2003).

A study conducted by the Bone Pain Trial Working Party revealed that a single fraction of 8 Gy is as safe and effective as multifractionation for bone pain (Yarnold, 1999). Another study by Hoskin, Yarnold, Roos & Bentzen, (2001) supports this practice. Not only do single fractions appear to be safe and effective, but this technique also reduces distress and inconvenience associated with repeated visits to the hospital (Wells, 2003). On the other hand, Arcangeli, Giovinazzo, Saracino, D'Angello, Giannarelli, *et al.* (1998) suggest from their study that patient with a good prognosis and performance status may achieve greater pain relief from doses delivered over long treatment period.

One advantage of using CHART is the reduction of late morbidity, however acute reactions are more severe (Dische & Saunders, 1999). A study by Bailey, Parmer & Stephens, (1998) indicated that pain was a significant problem in CHART patients and suggested that CHART should not be used in patients with a history of pain before radiotherapy.

3.12.3 Other methods

Surgery

Removal of a tumour or even part of a tumour has potential to reduce pain, relieve pressure on a nerve and improve prognosis, even increasing long-term survival of the patient (National Cancer Institute, 2009).

Neurosurgery

Neurosurgery on nerves that cause pain may be useful to relieve the pain. Nerve block is useful in pain management when pain medicine is injected directly around a nerve or into the spine to block the pain (Eisenberg, Carr & Chalmers, 1995).

Psychosocial intervention

The focus here is on perception, thought and cognitive techniques to relieve pain. These methods are designed to influence how one interprets events and bodily sensations, providing information to patients about pain and its management and helping them to think differently about their pain (Syrjala, Donaldson, Davis, Kippes & Carr, 1995).

Behavioural techniques are used for helping patients develop skills to cope with pain and to modify their reactions to pain. Included in cognitive-behavioural therapies are relaxation and imagery, distraction and reframing, hypnosis, psychotherapy, and structured support (Cleary, 2000). Psychosocial interventions also include education; in the form of information about pain, communication and the treatment process and provision of adequate psychological support to cope with pain (Doctor for Pain, 2008).

Physical therapy

Physical therapy has a long history of use in medical practice particularly for pain. Physical modalities, if appropriately used, can be effective in reducing acute or sub-acute pain and can be very beneficial for chronic pain (Pauline & Portenoy, 1999). A list of physical therapies includes:

- Thermotherapy: Deep heat including; ultrasound, short wave diathermy, and microwave.
- Hydrotherapy: warm or hot whirlpool baths.

- Cryotherapy: application of cold to local areas produces some therapeutic effects, including reduction of temperature, reduction of neuromuscular transmission, analgesia, and an anti-inflammatory effect.
- Electrotherapy: direct or alternating current are used in the treatment of various pain syndromes.
- Mechanotherapy: the physiologic effect of massage is to increase or regulate muscle tone (Doctor for Pain, 2008). The therapist's hands stimulate the transmission of impulses to the brain which produces sensation of pleasure and well being.
- Therapeutic exercise: this is used for the treatment of both acute and chronic pain. Body movement improves musculoskeletal function and helps to maintain a state of well-being (Doctor for Pain, 2008).

Supportive Therapies

Pastoral and spiritual support may be amazing factors in cancer pain management and may have a dramatic affect on the pain experience (Cleary, 2000). Having cancer and pain frequently raises issues of spirituality and strange beliefs for patients and their families, who may be helped by pastoral counselling or traditional medicine (Cleary, 2000).

3.13 Barriers to pain management and assessment

Barriers to good cancer pain management may be related to health practitioners, to patients, or to the health care system (Cleary, 2000). Problems related to health care professionals consist of inadequate knowledge of pain management, poor assessment of pain, fear of patient addiction to drugs and concern about side effects of analgesics (National Cancer Institute, 2009). In a study conducted by Von Roenn, Cleeland, Gonin, Hatfield & Pandya (1993), physicians acknowledged that they were not properly trained in pain assessment and hence do not address the issue of pain unless it is raised by the patient.

Patients are sometimes reluctant to report pain with the view of not distracting physicians from the treatment of underlying disease and may even fear that pain

means their disease is worse (National Cancer Institute, 2009; Ward, Goldberg, Miller-McCauley, Mueller, Nolan, *et al.*, 1993).

Problems related to the health care system include low priority given to cancer pain treatment, inadequate funding for appropriate treatments and problems of availability or accessibility of treatment (Cleary, 2000).

Good pain assessment is an essential step in pain management; hence health professionals must be aware of the barriers and the difficulties of pain assessment.

Barriers to pain assessment include:

1. The multidimensional, subjective nature of pain (American Cancer Society, 2007; Foley, 1998)
2. Lack of a clearly defined description for pain (Von Roenn, *et al.*, 1993) thus patients sometimes cannot find any word to define their pain.
3. Anxiety or depression of the patients being assessed (Grossman, *et al.*, 1991).
4. Poor communication between patient and health care professional (Morgan, Lindley & Berry, 1994). This includes over-estimation of pain by patient (Mitchell, Donovan, Miaskowski, Ward, *et al.*, 1995), under-assessment of pain by health professionals or care givers and language barrier (Greenwald, 1991).

3.14 Conclusion

Pain is a symptom experienced by many cancer patients regardless of disease or stage (American Cancer Society, 2007). To ensure proper management of cancer pain, health professionals must possess the necessary skills to identify the area of pain, the cause and the required treatment by proper assessment of the pain (National Cancer Institute, 2009). Health professionals must also recognize the components that affect pain relief, including the barriers to the treatment of cancer pain (Cleary, 2000). The management of pain in cancer patients should proceed with frequent reassessment of side effects of radiotherapy to ensure optimal cancer pain relief (Wells, 2003).

The next chapter discusses the research methodology for assessment of pain by the RTT.

CHAPTER FOUR

RESEARCH METHODOLOGY

4.0 Introduction

This chapter will explain the research design, participant selection criteria, data collection and data analysis methods used. The mixed method research design using qualitative and quantitative data is discussed. The data collection methodology was a concurrent triangulation involving a case study and a pain survey. The case study that included individual and focus group interviews, the response to patients' needs, relevant documents, and observations is discussed. The patient pain questionnaire was piloted and the significance of the pilot study is discussed. Other items which have been highlighted are the data collection procedure as well as the processes adopted by the researcher for data analysis. The chapter ends with discussion of issues relating to the ethical considerations for the study.

4.1 Research Aim

This study focused on investigating and understanding the role of the RTT in the assessment of pain in order to improve the contribution of the RTT as a member of the multi-disciplinary team with regard to pain management for the benefit of the patients and the radiation oncology team in Ghana.

4.2 Research Questions

The research questions for the study are;

1. What is the role of the RTT in the assessment of pain in cancer patients?
2. Should the RTTs' role be extended to include pain assessment?
3. What are the challenges for the RTT when taking on the role of pain assessment in radiation oncology?
4. Can pain assessment become a routine role for the RTT in a busy radiation oncology department?
5. How would this extended role of the RTT assist management of the patient?

4.3 Research design

The research design for the study followed the logical sequence of the data to be collected and the conclusions to be drawn answering the initial questions of the study (Becker, Dawson, Devine, Hannum, Hill, *et al.*, 2005). Therefore the research design dealt with four areas: the research questions, the relevant data, which data to collect and how to analyse the data.

4.3.1 Overview

In this study, a mixed method approach was used to collect and produce the data to answer the research questions. A concurrent triangulation design, which is mixed method research, was used with equal priority to the data sets. This is an approach discussed by both Good & Heppner (1995) and Hanson, Creswell, Clark, Petska & Creswell (2005). Qualitative data for the study was obtained through text generated from the researcher and the co-researcher's field notes as well as reflections following observation of the patients and work environment. Further qualitative data was collected from semi-structured individual interviews and a focus group interview with RTTs, RO and the nurse participants. Quantitative and qualitative data was collected from a survey of patients' perceptions of their pain using a questionnaire. In line with a mixed method research approach, the data sets were individually analysed in appropriate ways and then integrated during the interpretation and discussion of the findings.

A schematic summary of the research design is shown in the flow chart of figure 4.1.

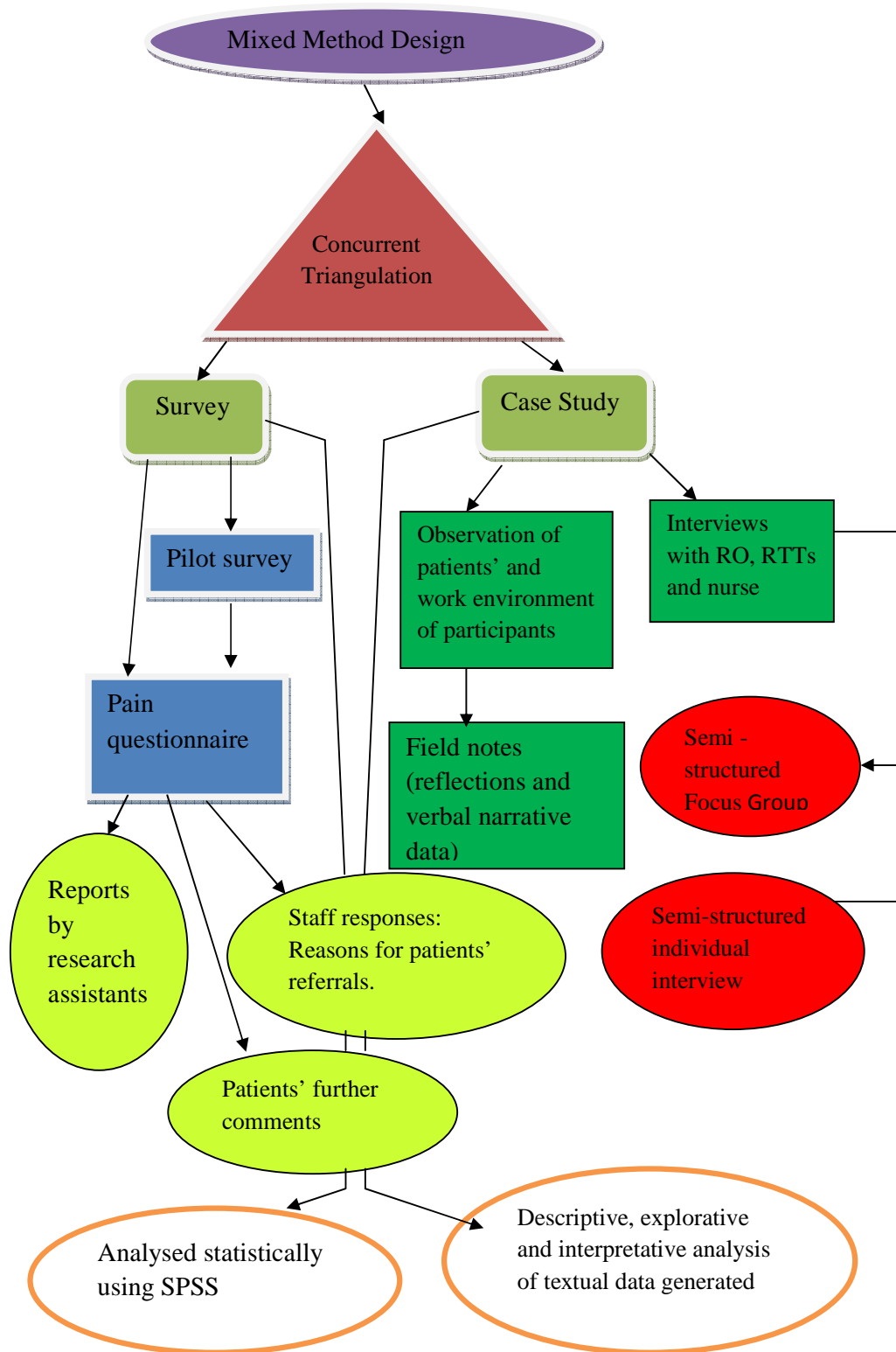


Figure 4.1 Schematic representation of the mixed method research design for this study

4.3.2 *The nature of mixed method research*

The idea of mixing different research methods probably originated with Campbell & Fiske (1959) who used multiple methods to study the validity of psychological traits. This encouraged other researchers and soon research approaches included methods such as observation and interviews combined with surveys (Sieber, 1973). Over time, mixed methods research has gradually made progress and has become a feasible alternative research method in social sciences (Creswell, 2003; Tashakkori & Teddlie, 2003; Greene, Caracelli, & Graham, 1989). Mixed methods research has become increasingly popular and is widely considered as ‘a legitimate, stand-alone research design’ (Hanson, *et al.*, 2005).

Mixed method research can be defined as the collection or analysis of both quantitative and qualitative data in a single study (Hanson, *et al.*, 2005). It involves the combination of data collected either at the same time or sequentially in the research process, giving equal priority to all data (Creswell, Plano, Clark, Gutmann & Hanson, 2003).

Tashakkori & Teddlie, (1998) as stated in Hanson *et al.*, (2005) that when both quantitative and qualitative data are integrated in a study, the researcher enriches his or her findings as against when one form of data is gathered. Hanson *et al.*, (2005) also stated that using a mixed method research design can allow the researcher to simplify results from two sets of data collected from a study population. Greene & Caracelli, (1997) in Hanson *et al.*, 2005 also stated that using both qualitative and quantitative data can allow the researcher to use different methods in generating data that can be adjusted based on the responses of the study participants.

Despite the advantages of using mixed method research, it poses several challenges to the researcher. These include the need for more extensive data collection, the time-intensive nature of analyzing both types of data and a requirement for the researcher to be familiar with qualitative and quantitative forms of research (Creswell, 2003).

There are six types of mixed method designs: three sequential (explanatory, exploratory, and transformative) and three concurrent (triangulation, nested, and transformative) (Hanson, *et al.*, 2005; Creswell, *et al.*, 2003). In this study, a

concurrent triangulation design which is the most commonly used design in mixed method research according to Hanson *et al.*, (2005) and Luzzo, (1995) was used. In the study by Hanson *et al.*, (2005), 22 mixed method studies in counselling were published between 1986 and 2000. According to them, concurrent triangulation design was the most common type of mixed method research among the six types identified by their study.

Concurrent triangulation design

Concurrent triangulation design can be defined as the combination and comparison of multiple data, collected independently and analysed at the same time (Hanson *et al.*, 2005). Equal priority is given to all the data collected but the data is analysed separately. Integration of the data occurs during interpretation of the findings which involves discussing the degree to which the data converges to enable the researcher to answer the research question (Hanson *et al.*, 2005).

4.2.3 Survey

The survey tool used in the study was a modified pain questionnaire by the pain management centre (PMC). The survey was used to answer the research questions one, three and five (see bullet 4.2).

Pain questionnaire

The pain assessment tool selected for this study was the Pain Questionnaire (PQ) by Pain Management Centre (PMC). This questionnaire is a modified version of the McGuire Pain assessment tool by McGuire (1981) and Short-Form McGill Pain Questionnaire (SF-MPQ-2) by Melzack (2009) which is seen as an improvement over the Gate Control Theory of Pain put forward Melzack and Wall (1965).

SF-MPQ-2 is a tool used to quantify the sensory, emotional and the evaluative components of the pain experienced by the patient. It is a widely accepted method for describing and quantifying pain (Melzack, 2009). SF-MPQ-2 has demonstrated reliability for assessing pain from a variety of diagnoses, including cancer (Funk, *et al.*, 1994). The Pain Questionnaire (PQ) by PMC was chosen as the most appropriate tool because it is relatively easy for the patient to complete. It places no burden on weak patients, requires less time to explain and administer, and can be easily repeated

if needed. The PQ was specially designed to collect data on the variables that influence the perception of pain intensity (Funk, *et al.*, 1994)

All the Pain Questionnaire (PQ) subscales have repeatedly demonstrated sensitivity to the treatments that are believed to decrease pain. The PQ has been identified as the appropriate tool for assessing patients with malignant pain because it measures the functional ability and activity of the patient (Funk *et al.*, 1994).

The questionnaire has four sections. Section 'A' and 'B' provide the general biographical information of the participants such as patient's identification number, age, sex, marital status and employment information. Section C, primarily concentrates on pain and consists of eight questions covering the location of the pain, duration of the pain, factors that relieve or increase pain and how and when the pain started. The final section 'D' of the questionnaire focused on the coping information from the patient on the treatment they have received to help with their condition.

Pilot study of the pain questionnaire

A pilot study was conducted before the questionnaire was administered to the study participants in order to check the validity of the questionnaire and to improve the clarity and understanding of the questions. A patient who was in pain at that time willingly volunteered to participate in the pilot study. It was further tested by a RO, chief RTT and a senior nursing officer who was also studying pain in patients at the time.

A pilot study is usually carried out with members of the relevant population but not with those who will form part of the study sample because it may influence the later behaviour of research subjects if they have already been involved in the research (Haralambos & Holborn, 2000).

The initial questionnaire (Appendix A2) and the initial letter of information developed by the researcher were given to the RO to study and to give comments and suggestions. The questionnaire was also given to the principal nursing officer in the department for comments. Finally it was given to the chief RTT who also gave his comments. Results from the pilot study addressed a number of issues relating to the questionnaire. It was revealed that the questionnaire used (Appendix A2) had to be

modified before the study. Through the pilot study, it was observed that some of the scientific words had to be simplified to give clearer understanding to the participants (Appendix A2, Question C2-II). For example words such as “excruciating and horrible” for pain description was simplified to extreme and severe respectively. The referral doctor’s name in this pilot study was removed from the main survey study because confidentiality needed to be maintained for ethical reasons.

In the description of pain under “Pain information” several other questions were modified (Appendix A2, Question C2-II). The patient’s description of pain during the past 24 hours which originally had six items (no pain, mild, discomforting, distressing, horrible and excruciating) was simplified to four items (no pain, mild, discomforting and extreme). Another example is a question on the extent that the pain interfered with the patient’s activities which had 11 items (from ‘not at all’ to ‘never free from extreme pain and interference’ Appendix A2, Question C8) that was simplified to only 4 items (from ‘not at all’ to ‘severe pain with constant interference’ Appendix A1, Question C8). The final section on “Coping Information” which consisted of two questions was reduced to one (Appendix A2, Question D).

Another observation through this pilot study was the length of time spent by the participant to complete the questions as almost 20 minutes was taken by the pilot participant. Considering the number of participants that were going to be recruited, their educational background, their condition, the length of time for the data collection and the fact that the daily work routine at the hospital should not be unduly interrupted during the study, it was decided by the researcher to reduce the number of questions but maintain the key areas of interest regarding information needed for proper assessment of pain. The pilot pain questionnaire was finally amended through the various contributions to the questionnaire used and shown in Appendix A1.

4.3.4 Case Study

A case study is an in-depth investigation of a single individual, group, incident, or community (Jon & Greene, 2003). It can also include experiments (Jon & Greene, 2003) and surveys (Yin, 2009). The case study is suited to mixed method research in social sciences (Flyvbjerg, 2006; Stake, 1995) as it provides a systematic way of looking at events, collecting data, analyzing information, and reporting the results

(Flyvbjerg, 2006). Through a case study the researcher gains understanding and identifies areas for future research (Flyvbjerg, 2006). In this study, the case study approach was very useful in addressing the research questions two and four (see bullets 4.2).

When doing a case study, it is important to use information-learning sampling, thus seeking information from subjects which can affect the research design because it reveals more information (Flyvbjerg, 2006). In this study, the approach was adopted whereby data was collected not only from the patients by means of a survey but also from the RTTs, a RO (doctor) and a nurse. This was done by means of participant observation of the work environment, interviews with staff participants and the written reflections of the participant researcher. The observations and interviews were recorded in writing thus generating textual data.

Observations

Researchers say that observation is the fundamental basis of all research methods because no matter which method one uses in any situation one would always make further observations to gather more evidence (McDaniel & Gates, 1995). Observation in this study involved careful watching and listening to the RTTs and some staff in the radiotherapy department (RTD) for data that would contribute towards answering the research questions. This was done with the aim of gathering data from the work environment which was considered as relevant information. The researcher's role in observation was as a participant and non-participant observer (Sim and Wright, 2000). The latter involved the researcher keeping a distance from the participants in the study; an approach which is normally referred to as '*complete observer*' (Minichiello, Sullivan & Greenward, 1999). The participant observation on the other hand engaged the researcher and participants in normal activities and communication processes during the study; an approach normally referred to as '*observer as participant*' (Minichiello, Sullivan & Greenward, 1999).

Interviews

Interview is the most widely used method of producing data in qualitative health research (Green & Thorogood, 2009). A semi-structured and a group interview or

focus group was used in this study. A semi-structured interview is defined as an interaction where the interviewer uses his or her own skills in social interaction to get others to disclose particular information and a group interview is an interaction where by the researcher simultaneously gathers data from more than one participant (Green & Thorogood, 2009). Conversations in the format of open-ended questions were held with the respondents (2 RTTs, one RO and a one nurse) until a mutual understanding was reached as suggested by Burns & Grove (2003).

The focus group interview was advantageous in this study because it encouraged the participants to express of themselves better and provided different opinions. It also provided a supportive forum for the expression of views by participants who were motivated by the group (Sim and Wright, 2000). Again, the focus group interview did not rely only on the ideas of the researcher and a single participant but also on the questions and answers produced by members of the group themselves (Morgan, 1997).

The semi-structured interview enabled the researcher to establish a relationship with participants with few questions and gain their co-operation (Leedy & Ormrod, 2001). This type of interview produced the highest response rate, allowed the researcher to clarify indefinite answers and gave room for follow-up information and questions where it was necessary (Leedy & Ormrod, 2001). Refer to Appendices A3, A4 and A5.

Field notes

Field notes comprised of generated text data from staff responses, patients' comments, and verbal narrative obtained during the study. Supplementary data which was both formal and informal (Macdonald & Tipton, 1993) were also generated from other sources such as reports by research assistants, comments from the RO and the researchers' reflections. Sim, (1998) in his article supported and recommended the use of textual and written data in health research.

4.4 Selection Criteria

This research comprised of a series of events which required the selection of co-investigators, sites, and participants.

4.4.1 Selection of co-investigators

Two qualified RTTs were selected as research assistants for the collection of data from the patient participants. They were purposively selected based on their competence to understand, speak, write and explain in the local languages and because of their interest and contribution to the research during the preparatory stages. Out of the nine languages approved by the government to be officially used in the country (Akan Kwahu, Nzema; Dagaare/Wale, Dagbani, Dangme, Ewe, Ga, Gonja/Kasem), the principal investigator could speak Akan and Ga and the co-investigators could speak the three (Ewe, Dangme and Kwahu). However because English is the official language used for educational instruction, the questionnaire was printed in English hence verbal translation was required for participants who could not read or write English.

The co-investigators were trained by the researcher as assistants in the study. The research objectives, the rationale of the study and areas of importance in the assessment of patients' pain were discussed with them. After several explanations they consented to become research assistants, their names were printed in the 'letter of information' (Appendix B) which was developed to further explain the entire process to the patient participants in its simplest form and they were supported in the process of completing the pain questionnaire with participants.

4.4.2 Site selection

The study was conducted at the National Centre for Radiotherapy and Nuclear Medicine, Korle-Bu Teaching Hospital (KBTH), Accra, Ghana between the months of March and May 2009. Korle-Bu Teaching Hospital opened by Sir Gordon Guggisberg in October 1923 is the nation's largest Hospital and the major referral centre in Ghana. It is an 1800 bed hospital that serves the entire nation and its neighbours. It is the teaching hospital for the College of Health Sciences (which includes the School of Allied Health Sciences, Medical School, Dental School, School of Nursing, School of Public Health and Nuguchi Memorial Institute for Research) under the umbrella of the University of Ghana, Legon.

Ghana has only two radiotherapy departments, one in the capital city, Accra with more infrastructures in terms of equipment and staff and the other in Kumasi. The radiotherapy department (RTD) in Accra is the national referral centre for the treatment cancer. This site was selected as the research site because according to the hospital data more than 70% of the total cancer cases seen in the country are processed through this centre.

The Department has six units that take care of patients need; treatment unit (with cobalt-60 machine, simulator and a mould room), treatment planning (a three-dimensional treatment planning system), chemotherapy unit, brachytherapy unit, clinic and nuclear medicine centre (which has a Single Positron Electron Computer Tomography (SPECT) and a gamma camera.

4.4.3 Selection of Participants

Participants comprised of 7 professionals and 90 patients. The professionals were involved in the case study and the patients were engaged in the survey.

Patient participants

A sample size of 90 patients was recruited. The participants were patients referred to the Radiotherapy department for the treatment of various malignant diseases and who met the inclusion criteria.

Inclusion criteria

Patients were selected who:

- Reported having pain to staff of the RTD,
- Were diagnosed with cancer
- Were mentally competent,
- Were able to understand English and /or one of the local languages, and who were
- Willing to sign consent to participate in the study.

Exclusion criteria

The following patients were excluded from participating in the study;

- Children,

- Clients with mental disorders.
- Blind patients and
- Those who for whatever reason were not willing to sign consent.

Participants were recruited from three different sections in the department, namely treatment floor, simulation room and the clinic. Patients on the treatment floor had begun their treatment already; those in simulation were about to start their treatment and those in the clinic were either attending for treatment review from the treatment floor or chemotherapy unit or patients who had been newly referred to the RTD.

Patients on simulation and treatment were selected by the co-investigators based on the inclusion criteria for the study. Those in the clinic were suggested to the principal investigator by the RO who had already contributed data to the case study.

Patients were coded from 1-90 in order to aid the researcher in following the patient treatment after the pain assessment. Also each patient was aware of his or her number. This was because their names were not disclosed to anybody during the survey for the sake of their confidentiality and it was only through their code that the researcher could identify each patient.

Sample size determination for patient participants

The formula that was used for the sample size calculation was; $n = [Z^2 p (1-p)] / E^2$ where n =minimum sample size needed for the study, p =population proportion of the cancer patients that were available at the time of study, Z =level of confidence which was defined as 95%, E =the maximum allowable error (5%) (Antwi-Bosiako, 2007).

On the average, according to the patient data for the only radiotherapy centre in Accra, Ghana 35 new patients undergo radiation treatment every month at the Radiotherapy department. This gives a total of 105 patients in 3 months on average. A sample size of 90 patients was recruited to represent 85.0% of the total number of patients undergoing treatment for the 3 month period (March 2009 to May 2009). $n = [0.95^2 \times 0.66 (1-0.66)] / .05^2$, $n = 81$ where $p = 105/160$, 160 being the population of clients visiting radiotherapy within three months (March=52, April=49 and May=59, Records RTD, 2009) and 105 representing those that were undergoing radiation therapy within the period of study. Hence the minimum number of patients needed was 81 out of a population proportion of 160 patients that attended the clinic between

March 2009 and May 2009. Ultimately 90 patients were eligible and entered into the study.

Professional participants

Participants were purposively selected to meet the criteria set by the researcher. The criteria defined by the researcher were any member of staff;

- Involved in the management of the cancer patients,
- Working at the RTD
- Qualified to make meaningful contributions to the study and who
- Consented to participate in the study.

In the selection of participants for case study, Becker, *et al.*, (2005), suggests that the number of participants should be relatively small so that the researcher can gather rich data and analyse information critically. The authors suggested further that the number can range from 1 to 8. The professionals included were five RTTs (two of which were research assistants for the study), one RO and a nurse.

Table 4.1 Professional participants selected

Professional	Code	Experience (years)
Professional 1	Pr 1	3
Professional 2	Pr 2	6
Professional 3	Pr 3 /R3	2
Professional 4	Pr 4 /R4	2
Professional 5	Pr 5	> 9
Professional 6	Pr 6	>12
Professional 7	Pr 7	3

Professional 3 and 4 were involved in generating two different data sets. First, as professional participants in the focus group interview they were coded as Pr 3 and Pr 4 respectively and second as co-investigators in the study as R3 and R4 respectively.

The researcher’s reflections in the study were also coded in order to record data generated from the investigator’s involvement.

4.5 Data Collection

Data was obtained through observation, interviews and field notes from generated text, patient's comments and the researcher's reflections. Survey data was collected by the researcher (principal investigators) and the co-investigators from patient participants who responded to questionnaires.

4.5.1 Survey

Ninety patients were asked to complete the questionnaire (Appendix A1) in the waiting room of the department after carefully reading the letter of information (Appendix B) that explained the concept and objectives of the study in English that facilitated easy understanding. Patients, who did not understand English or who could not read, were assisted by translators proficient in the local languages. After consenting to participate in the study, participants were asked to either sign or thumbprint on the pain questionnaire to show that they willingly wanted to participate. Since the questionnaire was easy to complete and included diagrams (Appendix A1), that simplified the description of pain, patients who could not understand English were still able to participate and express themselves very well to the investigators.

Where necessary the participants were assisted by the research assistants to insert their verbal information onto the questionnaire. The degree of assistance required was dependent on each patient participant. Patient participants included those who were being simulated at the time of study (n=39), patients who were on treatment (n=45) and those referred to the investigators by the RO from clinic (n=6).

Patients completed sections A and B by answering the questions on the questionnaire except for information on weight and height in section 'A' which was obtained from the patient's folder at the department. At the radiotherapy department in Accra, Ghana, patients' weight and height are taken on the first day of treatment as a regular protocol, and subsequently on a weekly basis when patients attend review; hence it was easy for the investigators to obtain this information from their folders. Other factors relating to age, marital status, and employment status were also crosschecked from individual folders to see if patients were consistent with their information.

In section “C” patients were asked to describe their pain and its location with the help of a diagram. Items regarding how pain interferes with their life were also captured in this section. There were both closed and open ended questions. The latter allowed for a description of their pain and feelings by the patients in their own language. For example the question ‘how did the pain start’ was open so that patients described this in their own words

In section ‘D’ participants were asked to describe the treatment they had had to help them cope with the pain during the time of the study.

4.5.2 Case study

Data was gathered from respondents through observation, interviews and researcher’s field notes. All notes gathered were either in English or otherwise translated into English and then interpreted.

Observation

Researchers suggest that the most effective method of understanding the nature of people is by observing them (Rosenbaum, 2002; McDaniel & Gates, 1995). By direct or complete observation, the researcher studied patient flow in the department and the care given to them by the staff especially the RTTs and the doctors. The researcher noted and recorded the ordinary and the remarkable features of everyday life of the patients undergoing radiation treatment, a similar approach recommended by Green & Thorogood (2009). Through participant observation, the researcher listened to patients’ complaints to RTTs at the treatment unit and carefully watched RTTs responses to them. The duration spent by the patients during their radiation treatment, simulations and clinical reviews were noted.

Interviews

According to the British Educational Research Association (2009), interviews are the best way of seeking other people’s views. In this study interviews were in the form of a communication where professional participants were involved in several conversations regarding their views about the management and the care of patients undergoing radiation treatment. Respondents were encouraged by the researcher to freely express their views on issues concerning the topic of discussion.

Through semi-structured interviews, the views of the RO and the nurse were explored regarding the effective management of cancer patients and the role the RTTs could play in pain management. The nurse who was studying patients with pain was asked questions about her study and this led to a discussion on the management of pain by means of a multidisciplinary approach.

A focus- group interview was useful in this research. The RTT participants were involved in a conversation on ways that patients' waiting time could be reduced and how care of patients could be improved. Several points and ideas were generated from the discussion and these were captured as text data by the researcher.

Field notes

Verbal and narrative data of participants, comments of patients and reflections of the researcher formed the field notes. The two research assistants reported on daily basis on the administration of the survey questionnaire to the patient. Their responses were noted and text data were generated from these reporting sessions.

Supplementary notes were generated from complete observation and other verbal narratives of patients' comments and complaints during the study.

As the researcher took notice of the flow of patients in the department and interviewed the respondents, several ideas and thoughts were developed in the mind of the researcher. With the aim of improving the quality of care given to patients receiving radiation treatment, several reflections were generated by the researcher regarding the management of pain. Some of the questions that the researcher reflected on were: what RTTs could do to help patients in pain and what RTTs could do to improve on the care of patients receiving radiation treatment. Responses to these reflections were documented.

During the generation of the field notes, the researcher also applied the 3Rs (Re-evaluate, Re-structure and Re-training) by Kawooya, (2008) which has been identified as steps for helping radiographers in their quest to achieve role development.

Responses to patients' need

Data was generated by the researcher through various responses to the needs of the patient participants during the study. The researcher referred patients who needed urgent attention to the doctors and noted key information about their pain and other concerns. A few of the patients were also referred to RTTs for counselling.

4.6 Data Analysis and presentation

Data from the professional inputs and questionnaire were analysed separately.

4.6.1 Analysis and presentation of the survey

Data from patient participants obtained from the 90 distributed questionnaires was entered into a database and analysed statistically using SPSS version 16 (Statistical Package for the Social Sciences) which was released by Nie and Hull (Levesque, 2007). The 16th version released in 2008 had features for descriptive statistics such as cross tabulation and frequencies among others, and was therefore chosen for this study.

Response frequencies for the survey questions were determined and displayed in tabular and graphical formats. Graphical representations of collected data were pie chart and bar charts. These present data in a more manageable and appealing way to the reader and simplify data for clarification.

4.6.2 Analysis of the case study

Data from observation, interview and field notes were analysed using a descriptive method of analyses described by Burns & Grove (2003). This involved three stages, namely; explanatory, interactive and interpretative stage.

In the explanatory stage, the researcher reads the scripts collected during the study several times with the view of becoming familiar with the data and also finding out whether the data collected was self explanatory, an approach recommended by Schwandt (1997). During this stage, the researcher attempted recalling observations made until he became engrossed with the data.

In the second stage which is also referred to as the reflective stage (Burns & Grove, 2003); a dynamic interaction occurs between the researcher and the data. Holloway, (1997) stated that 'researchers are reflexive when they refer back and critically

examine their own assumptions and actions through being self conscious and self aware about the research process. The researcher explored personal feelings on the data that may influence the study and integrated his understanding into the study.

The analysis and interpretation included linking the data from the survey to the findings of the case study. Connections were made and understanding gained through a process of theme identification and a search for alignment or contradiction between the identified themes and the original propositions generated from the interviews, observations and field notes. Analysis of the data included examining, categorizing and coding into identified or emerging themes in order to address the research questions (Yin, 2003).

4.7 Ethical Review

Mostly, research that involves human beings either directly or indirectly gives rise to ethical issues (Sim & Wright, 2000). In considering ethics for this study, it was necessary to consider the following basic principle or issues; respect for autonomy/persons, respect for privacy and confidentiality, the need not to deceive/exploit the participants and the need to consider risk of harm.

4.7.1 Respect for autonomy/persons

The researcher was required to protect the autonomy of participants involved in the study by obtaining informed consent from the study participants. Informed consent is the voluntary agreement of the individual participant to willingly participate in the research based on understanding the purpose and implications of the research (Sim & Wright, 2000). According to Sim & Wright, (2000) a good informed consent should factor four key elements, namely;

- Disclosure: this is adequate information about the study provided by the researcher to the participants.
- Comprehension: the level of understanding of participants, also known as *intelligibility*,
- Competency: participants' ability to reach an autonomous decision and

- Voluntary: the absence of pressure, influence or coercion.

Patient survey

A written informed consent (Appendix B) was a cornerstone of ethics for the survey. Participants were made to know that their participation was voluntary and that they could opt out of the study at any time even after signing the consent form. The patient participants were assured that there would be no consequence should they decided to withdraw their participation.

Professional participants

Informed consent was considered important to ensure the professional participants understood the purpose of the study and participated voluntarily. They were informed that they could withdraw from the study at any time without prejudice. The process of consent for the interviews was verbal consent before starting. In the case of the RTTs that prepared reports, consent was accepted as being given when they handed in their reports.

4.7.2 Respect for privacy and confidentiality

Privacy deals with access or information about participants where as confidentiality relates to the way the researcher treats information about participants in the study. According to Sim (1996) we breach a person's privacy by gaining direct entry to their personal issues and information without their approval and knowledge; however we breach confidentiality when information obtained is conveyed to others without the participants' permission.

In this study, participant privacy and confidentiality were a priority to the investigators. Participants were assured that information obtained would be kept confidential. Patient participants were informed that the information would be kept in their individual file and would be available only to the researcher and RO in charge of their management.

4.7.3 The need not to deceive/exploit participants

In this study, the researcher ensured that the aim of the study was clearly stated and explained to the participants (Appendix 'B') in order to rule out any form of deceptions and exploitations of participants. When participants are not told about the aim and

objectives of a study, such that they have to make incorrect assumptions about it, it is described as *deception* (Sim & Wright, 2000). Likewise when participants are used for the purpose of the research in that their dignity and welfare are disregarded, it is termed as *exploitation* (Sim & Wright, 2000).

4.7.4 The need to consider risk of harm

Risk is defined as any potential harm to participants involved in the study which involves psychological and physical harm such as any injury, distress or loss of self esteem (Minichiello, *et al.*, 1999). Participants were assured that there was not going to be any physical harm or discomfort associated with the procedure. They were also informed that they had a choice not to answer any question that made them uncomfortable or any question that they did not want to answer.

This study was reviewed and approved by the Health and Wellness Sciences-Research Ethics Committee on the 24th October 2008 (Appendix C). The ethics approval was supported by written permission (Appendix D) for the study from the study site in Ghana.

In the next chapter, the results of the study will be presented. The findings have been summarized in the form of tables and graphs with short explanatory notes as appropriate.

CHAPTER FIVE

FINDINGS: PAIN ASSESSMENT AND RTTs ROLE

5.1 Introduction

This chapter presents the findings of this research on pain assessment by the RTT and the possibility of involving the RTT in the management of pain. Firstly the findings are based on the results from the patient pain questionnaire (Appendix A1) survey presented in tables and graphs. The nature of the survey meant that some data resulted in findings not directly relevant to this study. This is either not presented or described briefly. The further findings are based on data collected through the case study; using observation, interview and field notes.

5.2 Patient survey

The pain assessment tool was administered to 90 patients and all the questionnaires were returned. However not all 90 participants answered all the questions. The total number of participants (n) therefore varies for some questions and is indicated accordingly.

The patient population comprised of 74.44% (67/90) female and 25.56% (23/90) male respondents. Sixty seven point eight percent (68/90) of the participants were married, 28.89% (26/90) were single and 3.33 % of the participants were divorced. The mean age of the patient group was 51.7 years and the median age was 53years (Refer to figures 5.1, 5.2 and 5.3 in the text please). The different cancer sites are also summarized in the table 5.1.

Table 5.1 Different cancer sites

Site of cancer	Frequency	Percent
Head/Neck	26	28.9
Thorax	18	20
Abdomen	29	32.2
Any other sites	17	18.9
Total	90	100

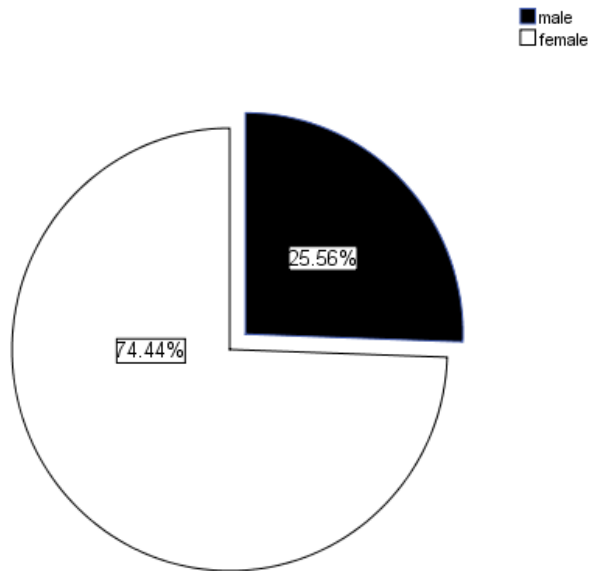


Figure 5.1 Gender of participants (n=90)

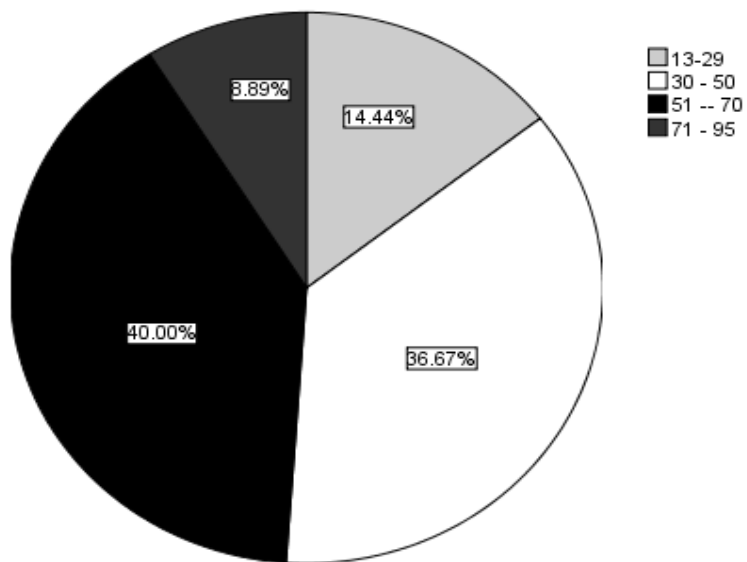


Figure 5.2 Age distribution of participants (n=90)

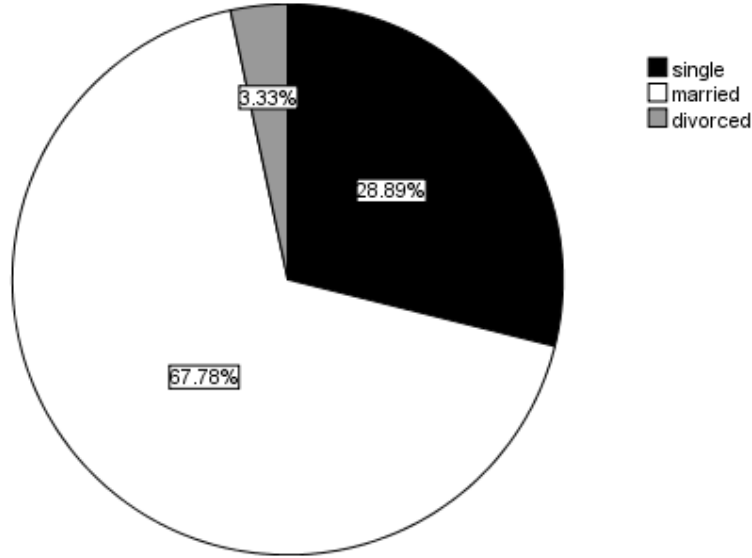


Figure 5.3 Marital Status of participants (n=90)

The employment status of patients undergoing treatment was not affected much except for 9% of patients who were in extreme pain (Figure 5.4).

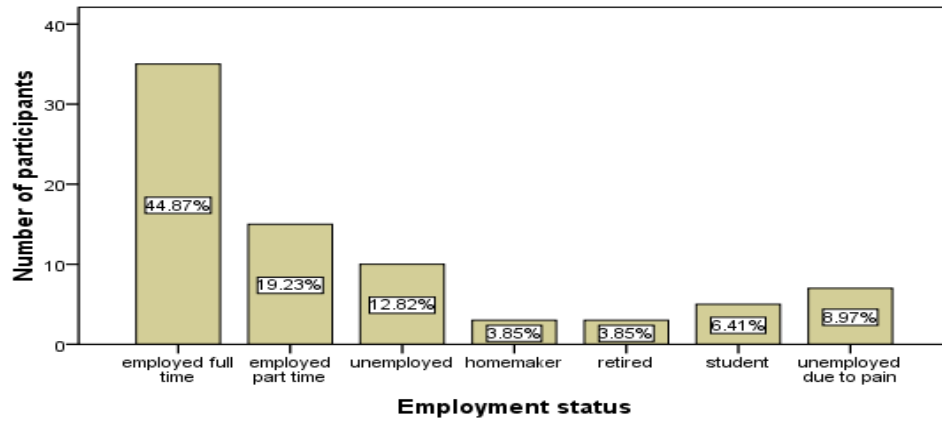


Figure 5.4 Distribution of Employment status (n=78)

Thirteen percent (12/90) of the participants did not answer this particular question. Out of the 78 patient who responded, more than half were employed either full or part time.

Table 5.2 Occupation of participants (n=90)

Occupation	Frequency	Percent
Administrative	9	10
Academic	6	6.7
Business Worker (Private)	7	7.8
Farmer	7	7.8
House keeper	3	3.3
Medical Profession	2	2.2
Unemployed	22	24.4
Police Service	5	5.6
Trader	29	32.2
Total	90	100

The study group represents a spread of occupations but the largest sub-group is that of traders (29/90) followed by those who were unemployed at the time of the study.

Table 5.3 Reason for coming to the RTD (n=88)

Reasons	Frequency	Percent
Referred	67	76.1
Treatment	12	13.6
To relieve pain	9	10.3
Total	88	100

This was an open question analysed through emerging categories. Each patient participant's answer was allocated to the closest applicable category only.

67/88 (76%) of the participants who answered the question gave the reason for coming to the department as being that they were referred and 9/88 participants (10.3%) stated that were seeking pain relief.

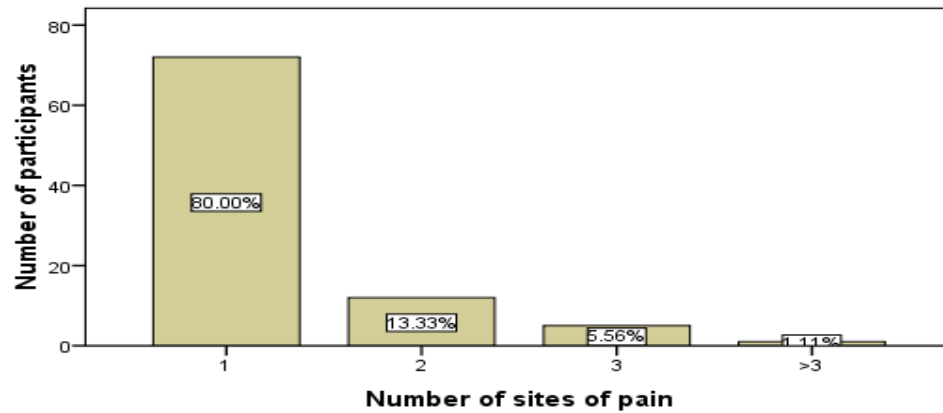


Figure 5.5 Number of sites of pain (n=90)

Eighty percent (72/90) of the participants had pain in one site whereas only 1 participant had pain in more than 3 sites.

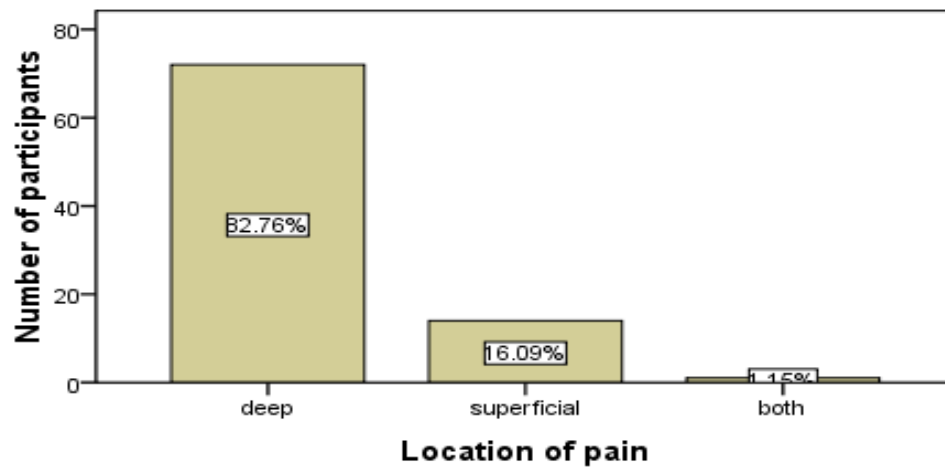


Figure 5.6 Location of Pain (n=87)

14/87 (16%) indicated their pain was superficially located whereas 82.76% (72/87) had deep pain.

Table 5.4 Experience of pain (n=79)

Participants' responses	Frequency	Percent
Constant and (either aching, burning or shooting)	13	16.5
Intermittent and (either aching, burning or shooting)	64	81.0
Aches only	2	2.5
Total	79	100.0

64/79 (81%) participants had experienced pain intermittently as aching, burning or shooting.

In this particular question (Appendix A1 Question C2), 14/90 (15.56%) of the patients described their experience of pain in their own way. Of these, 3/14 (21.4%) gave their own description in addition to providing an answer according to the options provided.

Three stated that they experienced pain whenever they bled; two indicated that they had itches; three stated that their pain was occasional; two indicated that they had pain when they ate; one stated that it was painful to sit down and three specified their area of pain without describing the sensation of pain.

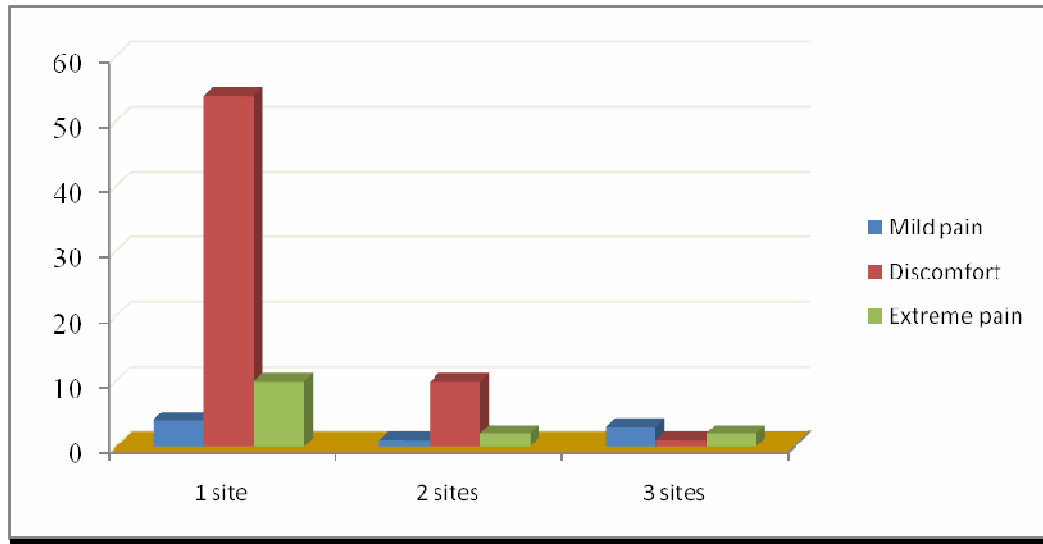


Figure 5.7 Intensity of pain on the number of sites (n=87)

In all, 68/87 (78.2%) had pain in one site, 13/87 (14.9%) had pain in more than one site and 6/87 (6.9%) had pain in more than two sites. 8/87 (9.2%) had mild pain, 65/87 (74.7%) had discomforting pain and 14/87 (16.1%) had extreme pain.

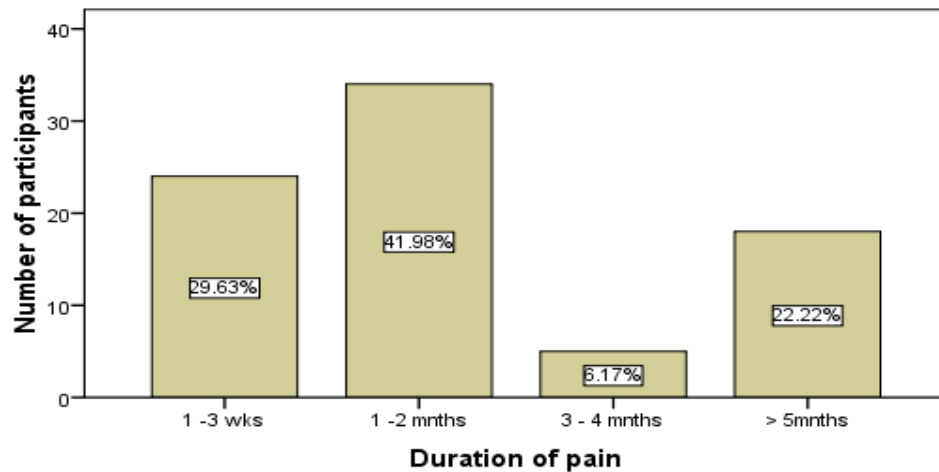


Figure 5.8 Length of time for pain (n=81)

Of the 81 participants who answered this question, 70% stated that they had had pain for more than a month and almost 30% indicated 1-3 weeks duration of pain.

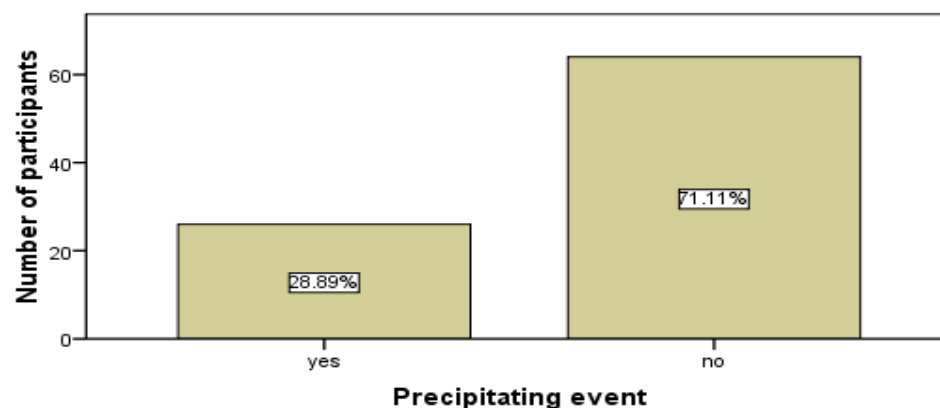


Figure 5.9 Precipitating event for pain (n=90)

Most participants (64/90) had no precipitating event for their pain.

Other factors stated by 24/90 (26.67%) participants, apart from positions described in 5.9 and 5.10, which makes their pain better were; drinking water, applying ointment, prayer, stretching of arms and bending. Twenty three of ninety also stated other factors that worsen their pain which include; closing of eyes, lifting, hot environment, coughing, arm movement, during menstruation, passing out urine, eating spicy food and working (sweeping, washing).

Table 5.5 How pain started (n=83)

Responses from participants	Frequency	Percent
Gradually /slowly	51	61.3
Suddenly	8	9.7
As a result of treatment	12	14.5
Other	12	14.5
Total	83	100.0

Categories emerged from this open question. Each participant was allocated to only one category.

Of the 83/90 (92.2%) who answered this question, 37 indicated that their pain started gradually, 12 stated that it they had pain as a result of treatment. 12/83 (14.45%)

stated specifically how it started and these were combined into the category; ‘other’. Among those categorized under ‘other’, participants described the onset of pain as manifestations of boils, sore, lump, growth, fever, bleeding, itches and a swelling.

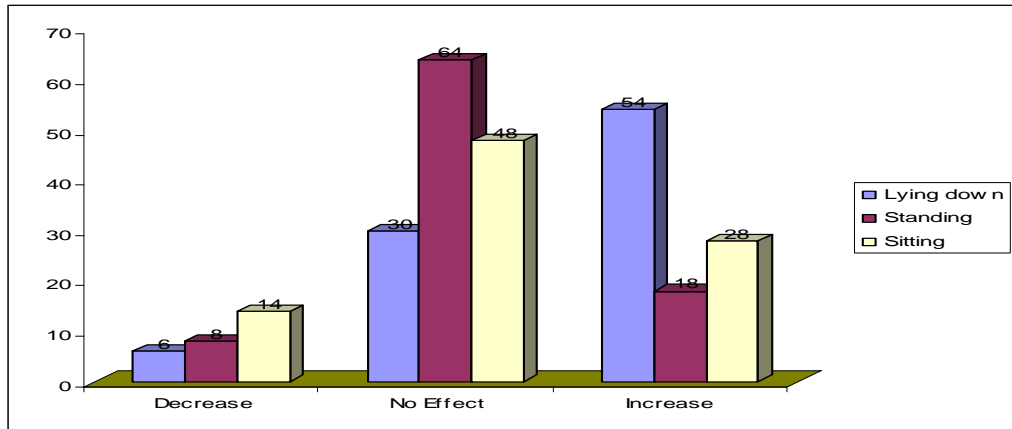


Figure 5.10 Effect of positions on pain (n=90)

Lying down and sitting increased 54/90 (60%) and 28/90 (31.1%) participant’ pain respectively and standing and sitting had no effect on 64/90 (71.1%) and 48/90 (53.3%) respectively.

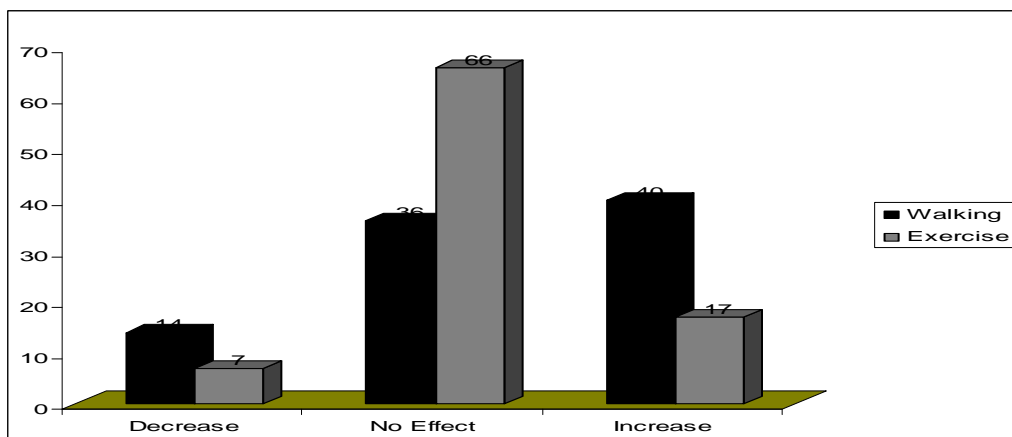


Figure 5.11 Effect of walking and exercise on pain (n=90)

63/90 (70%) stated that exercise had no effect on their pain, but 40/90 indicated that walking increased their pain.

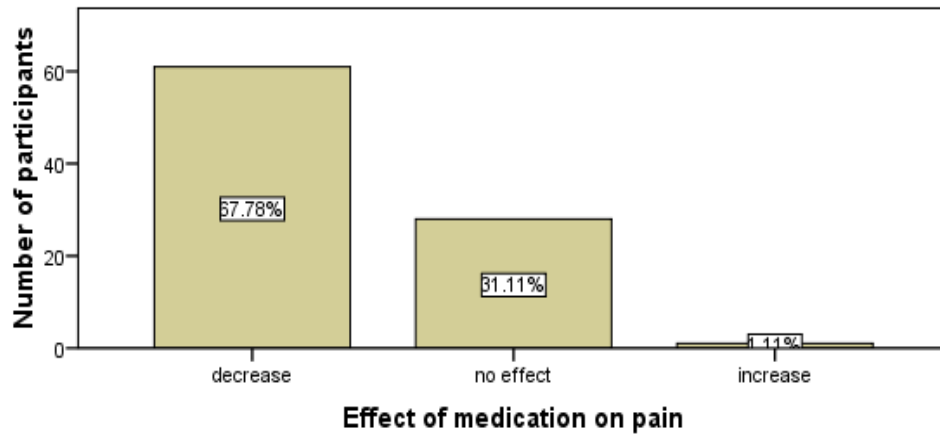


Figure 5.12 Effect of medication on pain (n=90)

61/90 (67.78%) of the participants indicated that pain medication decreased their pain.

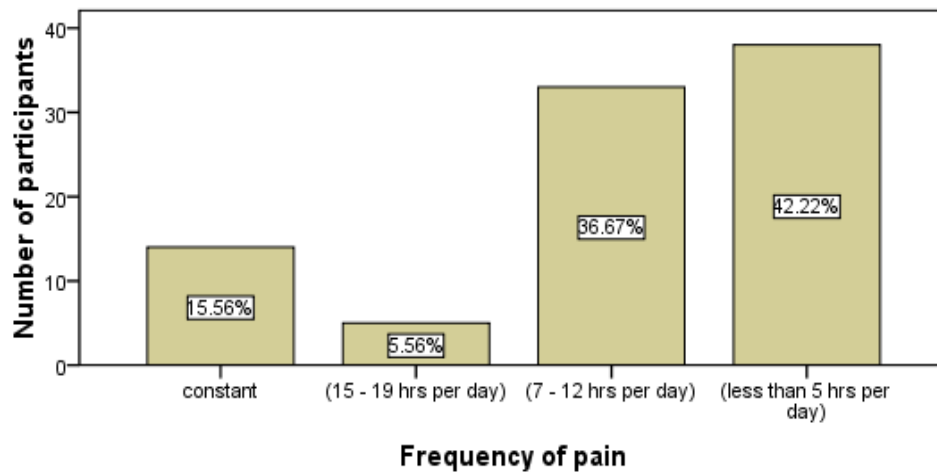


Figure 5.13 Frequency of pain (n=90)

14/90 (15.6%) of participants suffered constant pain, whereas 42.2% (38/90) had pain for <5 hours per day

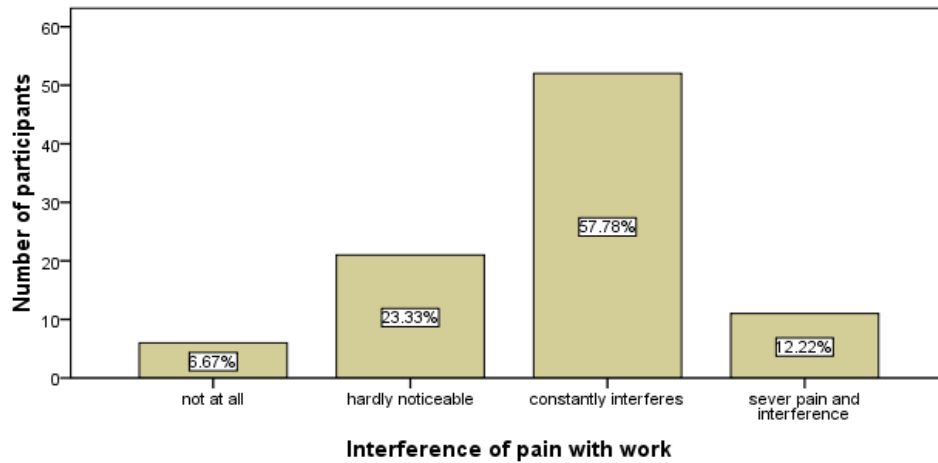


Figure 5.14 Interference of pain with work (n=90)

63/90 (70%) of the participants had pain interfering with work activities.

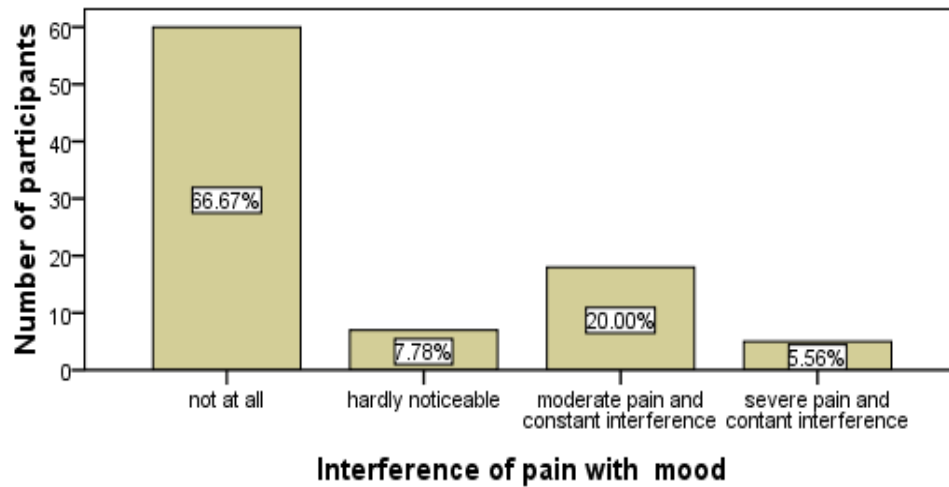


Figure 5.15 Interference of pain with mood (n=90)

The majority of the participants (67%) stated that their pain did not interfere with their mood.

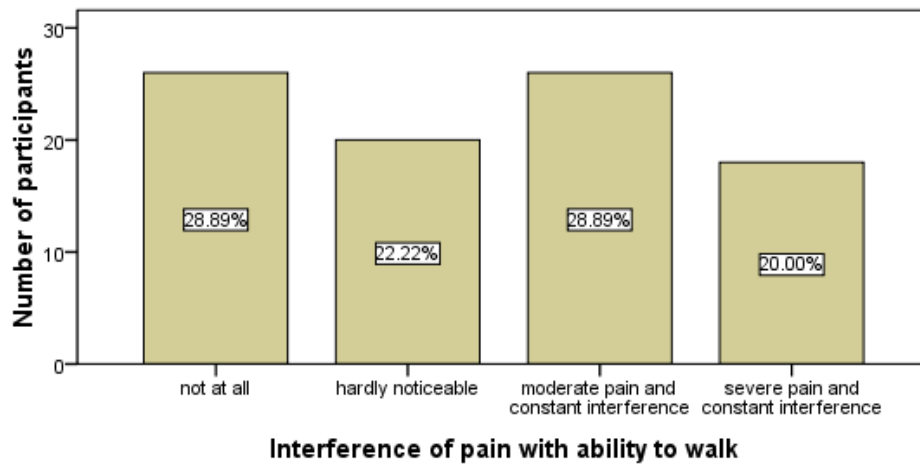


Figure 5.16 Interference of pain with ability to walk (n=90)

Almost 49% stated that their pain interfered with their ability to walk.

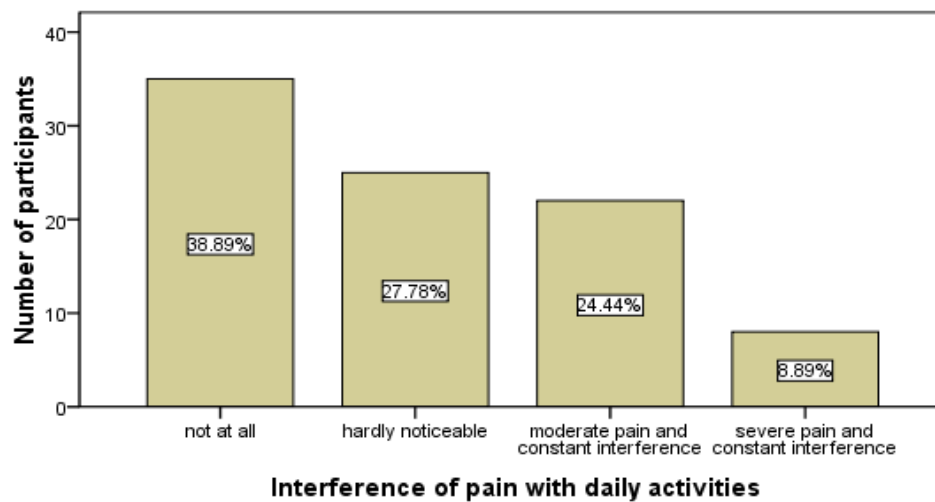


Figure 5.17 Interference of pain with daily activities (n=90)

60/90 (66.7%) indicated that their pain did not interfere or hardly interfered with their normal daily activities.

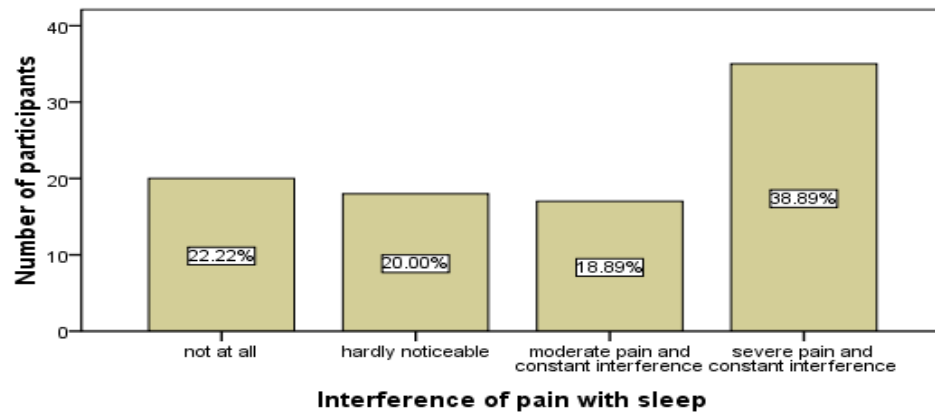


Figure 5.18 Interference of pain with sleep (n=90)

52/90 (57.8%) stated that their pain interfered with their sleep.

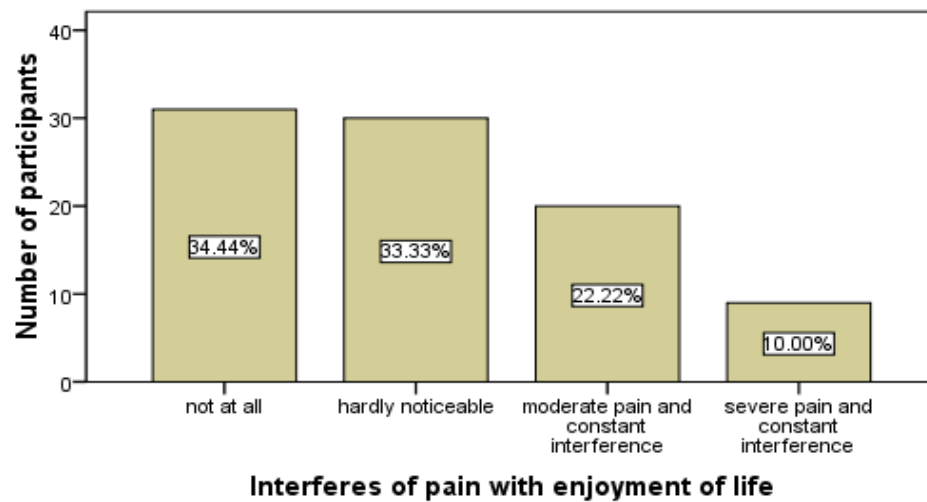


Figure 5.19 Interference of pain with Enjoyment of life (n=90)

The majority of patients enjoyed life irrespective of pain as 34.4% stated 'not at all' and 33.3% stated 'not noticeable' to this question.

Table 5.6 Treatment received by participants (n=90)

Treatment	Frequency	Percent
Radiotherapy	39	43.3
Drugs	23	25.6
Other	4	4.4
No treatment	24	26.7
Total	90	100.0

39/90 (43.3%) of participants received radiotherapy and 23/90 (25.6%) received drug therapy to help them cope with their pain. 24/90 (26.7%) stated that they had had no treatment.

5.3 The case study

Data was gathered through a case study that included the following data collection activities; 1) interviews with a RO, a nurse and the RTTs, 2) field notes recorded by the researcher documenting verbal narratives and participant comments and 3) reflective writing by the researcher following participant observation in the work environment. Thematic data analysis of the text data produced emerging themes and sub-themes that are presented as findings from the qualitative data analysis process.

5.3.1 Process and Workflow

Patient Presentation

Pain is frequently the reason why patients come to the hospital rather than that they are referred due to early diagnosis of their disease. One patient expressed it in this way;

...I was walking from home to work one morning when I felt a sharp pain in between my thighs...I became worried at that moment...but because it stopped during the day, I didn't take it so serious until two weeks after when I started feeling the pains again. This time it was all over my body especially my thighs, abdomen and my shoulders...I became very afraid and thought I was going to die so I quickly phoned my daughter who came for me to the hospital... (P32, 11/05/09).

Another patient communicated it in this way;

...Personally I hate visiting the hospital so though I had been experiencing pain couple of times I ignored them...but this time I couldn't help it anymore...In fact it was so severe that I stayed away from work several days...and you know we military men have strict rules and nobody dare to disobey the commander's roster... but I couldn't help it...After staying at home for two weeks my legs got swollen and the pain increased so I was rushed to the hospital by my wife... (P83, 21/04/09).

Many of the patients presented to the radiotherapy department because they had pain and not because they had knowledge of their medical condition. Of the patients that were referred, most referrals were by medical doctors in regional hospitals but there were also referrals from neighbouring countries of Ghana. Amongst the patients who self-referred and those referred through the health care system many came not knowing that they had cancer.

Department workflow

Patients undergoing radiotherapy were seen to have a daily routine whenever they came to the department. They always entered the waiting room with their hospital appointment cards. Patients for radiation treatment, who had been in the department a couple of times, knew their way to the treatment floor and reported directly to the RTTs before returning to the waiting room until it was their turn for treatment.

It was noted that most of the patients with an appointment for simulation did not receive adequate information on the first day of their visit to the clinic and therefore were mostly seen at the reception desk making enquiries. One of the patients commented;

...the ... didn't tell me where I should go. ...just told me to come on Monday at 10.00 am for simulation...I thought I was coming to see ... for the simulation so I went to the records but I was told my file had been taken to the treatment unit... (P12, 11/06/09).

The workload of the two ROs makes it difficult for them to give all the information:

...You guys are aware of my workload...you don't expect me to remember everything about patient...sometimes I expect that the record keeper will give this basic information... (Pr 5, 24/04/09).

It was also noted that patients visiting the clinic followed three referral patterns; 1) scheduled review from treatment floor (radiation treatment unit and chemotherapy) with referral by the RTTs according to a review schedule, 2) new patient processed via nurses or record clerk and 3) emergency referral from the treatment floor for patients requiring urgent medical attention.

Waiting times

The waiting times of patients for simulation, review and treatment were monitored during the study. The radiotherapy department (RTD) has one waiting room that accommodates all patients in all stages of the treatment process. This is different from many other centres where there are separate waiting rooms for new patients, clinic visits, simulation and treatment.

It was noted that there is no protocol to check the flow of work in the clinic except for emergencies. Patients were said to be seen on a 'first come first served' basis except for those who had a personal appointment with the doctor or had an urgent need. The departmental assistants (DA) manage the order of patient folders and call the patients to the consulting rooms for review. It became apparent that all non-emergency patients waited for long periods and some even complained that the DA's were not following the protocol. This was further complicated by patients reporting to the hospital very early whether they had an appointment or not with the hope of avoiding a long waiting time:

...I was told to come for treatment at 11.00 am, but I was here by 6.30 am because I wanted to see the doctor before the treatment...I have to get my file to the doctors early so that I can be served first and have my treatment at 11.00 am...I don't want to wait...(P1, 6/05/09).

One explanation of the long waiting time for patients is that there is an inadequate number of doctors in the department (Pr 7, 19/05/09). The two ROs have several responsibilities besides the clinic reviews.

...RO's help RTTs during simulation, draw treatment volumes for patients that were planned, prescribe radiation doses for treatment, are involved in clinical mark-ups for patients ... They are part-time lectures in the University of Ghana ... (Pr 7, 19/05/09).

This affects workflow and impacts on the quality of service provided for the patients:

...the doctor forgot that I was waiting... I don't know where the doctor went...the doctor received a phone call and excused me and for 40 minutes, I was still waiting...I am sure it was not intentional but I was very upset ... (P 46, 23/04/09).

Patients on radiation treatment monitored by the RTTs had a scheduled time for treatment. Yet this did not always go as planned due to the time taken for some of the patients to return to the treatment machine after referral to the clinic. Evidence shows that when patients are delayed during their review, the flow of work on the treatment unit is affected.

One of the RTTs (R3) commented:

...why can't we take care of our own patients ...I think that if we did, it will help solve all these problems... they spend too much time during review... and when they come back they want to have their treatment immediately because they think they reported early... (R3, 15/05/09).

It was noted that though RTTs were in charge of patients' appointment for simulation, their waiting times were partially controlled by the ROs, hence the waiting times for simulation was longer than at other places in the radiotherapy process. In the focus group a comment by an RTT at the simulator was:

...I prepared the patient an hour ago and called the doctor three times but the doctor never showed up till I went to (the) consulting room... (Pr 1, 15/05/09).

...The patient was lying on the bed for almost 45 minutes and the doctor was not coming...As I decided to get him from the bed, the doctor showed up and apologised...Apparently the doctor was called into the brachytherapy room and forgot

that I had called....All I needed from the doctor was to check the field so that I could take my films ... (Pr 2, 15/05/09).

It was observed that some patients were reporting to the department very early to avoid long waiting times. Again, it was noted that the patients' appointment system was not working as planned by the RTTs because almost every patient interviewed wanted to come early. They were reporting very early for fear that if they don't they might end up missing their bus home.

Treatment review

The department procedure is that reviews are performed by the ROs from Monday to Thursday and that Friday is reserved for emergencies and clinical review meetings. Yet the evidence from this study is that the doctors work on most Fridays like on any other day because of patient referrals by the RTTs and at times the nurses.

One of the research assistants (R3) reported data to confirm that a patient was referred on one of the Fridays during the study;

...I had to refer a patient (P72, 12/06/09) to the doctor immediately because I saw that she was in severe pain and she couldn't walk properly...I was anticipating that it was fracture and needed confirmation from the doctors...and the patient also told me she had difficulty in sleeping at night... (R3, 20/06/09).

As the principal investigator, it became very necessary to refer a patient for review on Friday even though I knew it was not a day for review, but I could not help it because the patient (P6, 10/06/09) had severe pain and was bleeding through the nose. Some of the patients scheduled for an afternoon treatment had complaints and had to see the doctor before treatment.

5.3.2 Pain and cancer

Many cancer patients suffer from pain due to their disease. Almost all the patient participants assessed during the study had pain. The word 'severe' was commonly used in describing pain by the patients especially those with advanced disease. One patient described his pain like this;

...The repeated pain in my abdomen is very severe...It sometimes extends to my stomach... (P23, 22/04/09).

Others described it as mild which suggested that it was not serious; some also chose words like sharp and burn. One of the patient's descriptions of pain was;

...and it often comes in the afternoons as a sharp pain around my armpit...but it's mild and not very serious...I think I can manage it for now... (P17, 9/06/09).

Cancer also generates emotional pain for patients. One patient described it in this way;

...my husband left with my children after I was diagnosed of cancer...I have not seen my family for the past six months...I feel so much pain when I think about them (P11, 5/06/09).

Pain also entered the conversations with the RO (Pr 5, 24/04/09) when it was suggested that patients have pain as a result of their radiation treatment. The RO commented that planning of patient's treatment and quality checks on their treatment set-up will help to target the radiation more accurately and thereby reduce the high dose areas and the intensity of the pain from treatment. The doctor commented in this way;

...All over the world cancer patients suffer from pain but sometimes they react to radiation treatment which also generate pain...but I believe we can help them as we improve our work by double checking our set-ups and techniques...We must be planning most of our treatment if not all so that we can reduce these reactions and lessen their pain (Pr 5, 24/04/09).

Pain from treatment

This study showed that for this population pain was a general problem facing most cancer patients:

...I must confess that most of our patients are going through severe pains, and I believe they need our help more than ever. ..The most unfortunate thing about some

of the patients was that they felt they were a bother to us if they complained to us... Others also have pain but could not describe it very well... (Pr 6, 22/05/09)

The cause of patients' pain can be the disease or pain can arise due to the treatment he or she is receiving. At times the reason for a patient's pain is unknown. In one of the interview, the nurse pointed out some causes.

...I think for most patients, their disease was causing their pain...some also were the results of the chemotherapy drugs we gave them, others I don't know... (Pr 6, 22/05/09).

Observation made on patient participants during the study indicated that patients had severe reactions from radiation treatment in a form of a line cutting across the end of their treatment fields (Pr 7, 19/05/09). It was observed that patients with cancer of the head and neck with three treatment fields (two opposing laterals fields and an anterior neck field) were reacting severely on the edge of the matching area (Pr 7, 19/05/09). Similarly, patients with breast cancer who were being treated with three fields (two tangential fields and a supraclavicular field) had a similar skin reaction.

According to one of the patients, this particular reaction caused him much pain (P 81, 30/03/09):

...whenever I lie on my back, I feel pains around my neck and the area you are treating. I can't even touch the area it's so painful... (P90, 4/05/09).

Patients with pelvic cancers were not exempt as some reported having pain from severe reaction to their treatment (P 25, 11/06/09). Obese patients had severe diarrhoea and wet desquamation in skin folds which some reported as causing them severe pain (P8, 10/06/09). For all these patients, pain was a very common complaint given to the RTTs.

For most patients, even though they had pain, describing it to the assessor was a problem. One of the professional participants confirmed this when she was asked (Appendix A4) 'what was the most outstanding observation in your findings'

...Others also have pain but they could not describe it very well... (Pr6, 22/05/09).

A comment from R4 also indicated that patient's ability to describe their pain was a problem.

...some of the patient I met couldn't have any appropriate word to describe their pain, some used some jargons which I understood but I couldn't translate them into English, or even in the local language....One patient said I fell like 'brrrr', and another said 'ashhh', and 'hooo'... (R4, 1/06/09).

Pain affects behaviour and lifestyle

Pain affects the behaviour and lifestyle of patients undergoing radiation treatment. In one instance the researcher observed that some patients preferred standing and walking around to sitting in the waiting room, even though there were empty chairs available for them to sit. Reasons given by some patients for that were:

... but I feel pains when I sit...because of that I prefer to stand rather than sitting but I also don't want people to know so I sometimes walk around the department...My son will come and call me when I am called... (P32, 11/05/09).

It was also noted that some patients had pain affecting their:

Mood: ... I'm going through so much pain that I can't even smile at people when I even have to do so... sometimes 'they' misunderstand me but I know what I'm going through... (P17, 9/06/09).

Work: ...I have to trade and pay my bills, pay my children's school fees and feed my family...I wish the treatment was free...I would have stopped trading...sometimes I don't go to work because of pain... (P90, 4/05/09)

and even their sleep:

...I struggle to sleep at night...and I don't know why my pain becomes very serious during the night... (P82, 21/04/09).

5.3.3 RTTs role

During this study the duties of the RTTs in the research site were noted during a focus group interview with RTTs and through participant observation. One RTT described their role in the radiation oncology department in this way;

...Our duty is to position patient for simulation and treatment...We observe patient undergoing treatment and report any clinical complication to the RO (Pr 2, 15/5/09).

Another RTT confirmed the role of the RTT in Ghana as being focussed on treatment and patient care;

...We administer prescribed treatment dose to patients accurately... we give emotional support and advice to our patients...We ensure that radiation protection measures at the treatment area are adhered to by all staff and patients... (Pr 3, 15/5/09).

RTTs in Ghana are conscious of their role in the care of the patient and during a focus group interview, one of them commented:

...I think we are doing our best, but we can do better for them (the patient)... I believe we must always put on a good facial appearance when chatting with them irrespective of our own personal feelings... (Pr 2, 15/05/09).

Several roles of the RTT during the study were also noted from the researcher's observation of the work environment. These include supporting and careful positioning of the patient in pain, counselling of patients and answering patients' questions (Pr 7, 16/06/09).

From observation, patients with head and neck cancer, who had either a tracheostomy tube or had reacted to treatment with wet desquamation, had difficulty in lying down with their head on the head support. The RTTs supported the patients in such conditions by holding their head or their neck during positioning until they were comfortably lying down (Pr 7, 24/04/09).

RTT's role in pain management

Reflecting on the study, the principal investigator noted that RTTs helped in the management of patients on treatment to reduce the workload of the doctors (Pr 7, 24/04/09).

RTTs assessed patient's pain and the outcome of their assessment brought much attention to the quality of service delivered to patients in the department. In a focus group interview one of the RTTs asked a question;

...should pain assessment end after this study... (Pr 2, 15/05/09).

This generated into a discussion on role extension.

5.3.4 Role extension

Role extension is considered by RTTs in Ghana and one view is that routine quality control which is done by the medical physicists in the department should be the duty of the RTTs. The RTTs described it in this way;

...It is our duty to ensure routine quality assurance on the treatment machine and the simulator... (Pr 4, 15/5/09).

Role extension was a recurring theme particularly from data gathered from the RO and the RTTs:

...We have to help in the treatment planning so that we can insist on patient's plan before treatment... (Pr 4, 15/05/09).

...Much depends on you [RTTs], even if patient's treatment is planned, the interpretation and reproducibility of the plan during treatment lies on you... (Pr 5, 24/04/09).

...I also think that the prime concern of our treatment should be to deliver the best care to our patients... (Pr 3, 15/05/09).

...I think we can encourage and reassure them to continue the treatment because stopping the treatment wouldn't help either... (Pr 1, 15/05/09).

Data from an RO interview (Appendix A3) revealed that some of the load on doctors could be shared with RTTs when the RO said:

...You can sometimes use your discretion on which patient sees a doctor and when...I believe we are all professionals and sometimes we can help each other. You don't need to send all patients to us... (Pr 5, 24/04/09).

In trying to answer the question on whether pain assessment should be part of the RTTs role even after the study, the concept of role extension was revisited by the RTTs in their conversation and the conclusion drawn was that pain assessment could possibly be an extended role for the RTTs at the RTD in Ghana and that this could help reduce the workload of the doctors and further reduce patient waiting time as well as improve the quality of care offered to patients (Pr 7, 19/06/09).

The role of the RTT in pain assessment and management was discussed further in terms of what the RTT could do to help a patient with pain and that improved treatment planning would help to reduce radiation effects and the resultant pain.

...Personally it is a concern to me, and I think that the earlier we do something about it the better...I believe that we can comfort them so that they don't feel depressed...however, we should begin insisting on patient's plan before treatment now that we have the three dimensional treatment planning system... (Pr 1, 15/05/09).

Another suggested how RTTs can manage patient with pain in this manner;

...I think we can reassure and encourage them to continue the treatment because stopping the treatment wouldn't help either... (Pr 4, 15/05/09).

Except for patients needing emergency treatment, the RTTs see their patient for the first time during simulation. From then they see the patient for each radiation treatment. This study again emphasised that the RTT can make a major contribution to holistic patient care and the RO stated that:

...Well you guys are doing well even though there is more room for improvement. The only problem I have with you is that you keep referring patients to us and sometimes even on Fridays... (Pr 5, 24/04/09).

Although the majority of the RTTs were of the view that pain assessment and management could be a role extension for the RTTs in Ghana, a research assistant reported that one RTT thought otherwise:

...One of the RTTs was of the view that management of pain was not his responsibility and felt reluctant to help a patient (P10) assigned to him by R4 during the study (Pr 7, 30/04/09).

5.3.5 The need for a pain assessment tool and procedure

Data from the research assistants, patient comments and the researcher's field notes showed the need for the development of a pain assessment tool to be used in the research site. Reports from research assistants indicated that there should be a protocol to define which patients must be referred to the doctors. The research assistants (R3 and R4) gave data to indicate the importance of the tool when it is developed:

...I simulated a patient (P31) with pain in three different sites but never identified any until the patient participated in the study. I wouldn't have noticed that it was very serious until I conducted the pain assessment tool...and surprisingly the patient didn't complain... (R4, 11/05/09).

...Through pain assessment, patients were able to express themselves better to RTTs... I think that developing a similar tool for use in the centre will help in the continuous care of pain in cancer patients... (R3, 10/06/09).

Likewise, the researcher identified through participant observation that the development of a pain assessment tool will enable RTTs to define which patients should be managed by them. Some comments generated from the focus group interview gave some points on the need for pain assessment tools. From the discussion with the RTTs, it was further noted that some of the patients should be referred to the doctor while others can be easily managed by the RTTs. One of the RTTs described his view in this way:

...I feel very uncomfortable when setting them up, because of the pain they are going through...I think that we have to send them to the doctor rather than trying to do anything for them ... (Pr 2, 15/05/09).

One of them also expressed his view in this way:

...We can decide on which patient we will send to the doctor and when...I think some of them we can stop their treatment and refer them when we see their pain is very severe... (Pr 1, 15/05/09).

In an interview with Pr 6, the researcher was educated on how nurses manage patients with pain. A response from the nurse pointed out that they use medication and sometimes they counsel the patients but mostly they refer patients in pain to the doctors especially those with severe pain (Pr 6, 22/05/09).

The content of the tool

The content of the pain assessment tool were generated through various comments of the patient participants and the data produced through the reports from the research assistants. First of all, comments and reports from participants pointed towards the exclusion of certain questions in the demographic data.

...I think in the first place we shouldn't have included the question on their educational level, since it was a problem to many of the patients. In fact some of the patients I interviewed either didn't know or felt reluctant to disclose the educational level... (R4, 1/06/09).

...I feel that the question 'are you currently working' and 'current occupation' were confusing to the patients. I believe they were more or less the same question. I couldn't even translate them properly to the patients I interviewed... (R3, 1/06/09).

The researcher in his reflections on the responses from patients noted that the question on the patient's date of birth was not answered by many of the patient participants.

... For a moment I thought about its significance to the study and I felt that it was not needed in the pain questionnaire... (Pr 7, 19/06/09).

While other patients felt some questions were irrelevant and should be excluded, some suggested the inclusion of other questions in any future tool for pain assessment. The co-investigators captured comments from patients in their reports.

...While I interviewed the patients, one lecturer who was a patient participant (P87) drew my attention to the question ‘why are you seeking treatment at RTD’ he said and I quote “You guys know why we are here, aren’t you? Why do you want me to tell you again” ...as I pondered on this I felt very embarrassed because of the way he said it and wondered that all along we didn’t see, even through the pilot study, but anyway. ...I noted and thanked him... (R3, 1/06/09).

...Most of the head and neck patients couldn’t shade/mark the location of their pain because the area was very small for them...I think next time we have to give them a separate diagram of the head and neck for easy description and location of their pain... (R3, 1/06/09).

...I realized from the questionnaire that patients with pain for weeks and days were not catered for because the question on ‘duration of pain’ was in months and years, I found a way to include this in my subsequent interviews when I noticed... by asking them to instead of allowing them to choose between the months and years...I’m sure that patients who didn’t answer this question were justified...Of course if nobody asked them the duration and were suppose to complete it by themselves ... then they would skip it when they find out their duration were not covered... (R4, 1/06/09).

5.3.6 Data generated from responses to the patients’ referral needs

Some of the patients were referred for treatment immediately during the study. A selected number of their responses, treatment received, comments and reasons for referral are shown in Table 5.7.

Table 5.7 Reasons for patient's referral

Patient	Professional	Reason	Treatment received	Comments
P6	Medical doctor	Bled through the nose and had severe pain at night	Radiotherapy and medication	Assessed by Researcher on 10/06/09. Seen on the same day.
P10	RTT	Had occasional pain but complained that he had no treatment even though was receiving radiation treatment	Counselling and psychosocial therapy	Assessed by R4 on 30/03/09. RTT reluctant to help patient. Patient re-assigned to another RTT
P19	RTT	Patient stated factors that made pain either better or worse	Supportive therapy and counselling	Assessed by R3 on 14/05/09. Patient specially monitored and supported during treatment
P31	RO	Patient with pain (constant aches) in three different sites	Medication	Assessed by R3 on 11/05/09. Patient not seen on the same day, RO not pre-informed
P50	RTT	Patient with pain from treatment and had already previously seen the doctor	Counselling	Assessed by researcher on 10/06/09. Patient reassured by RTT
P48	RO	Patient complained of constant shooting pain	Medication	Assessed by R4 on 5/6/09. Patient seen on the same day, RO stopped patient treatment and asked patient to see her on 8/06/09.
P71	Medical doctor	Patient could not walk and sleep because of pain	Medication	Assessed by R3 on 12/06/09. Patient encouraged to continue treatment

In the next chapter the results from the survey and case study presented in this chapter will be discussed. The focus of the discussion will be to develop the recommendation of pain assessment as a suitable area for role extension for the RTT in Ghana.

CHAPTER SIX

RTT'S ROLE IN PAIN ASSESSMENT

6.1 Introduction

By means of a mixed method study data was collected through observation, interviews, field notes, responses from patients' need, administration of a pain questionnaire to 90 patient participants and patient further comments. Analysis of data was focussed on exploring the RTTs role in pain assessment. Recommendations and suggestions are made regarding the role of the RTT and how the quality of care to patients can be improved. The research questions served as a guide to the discussion. The final contribution of this thesis is the presentation of a new tool for pain assessment designed to be used by the RTTs in Ghana for assessing pain in cancer patients. The chapter concludes the thesis by discussing pain assessment as a role extension for the RTT.

6.2 The Role of the RTT in pain assessment

Through the study, several roles of the RTT in the assessment of cancer pain were identified. Through careful analysis of the responses from the survey and the case study, three patient groups were determined:

- Patients needing urgent attention, and requiring immediate referral to the doctor.
- Patients who can wait for their scheduled review date.
- Patients with pain that can be managed by the RTTs.

6.2.1 Category One: patients referred to the doctors

Through a process of reflection on the data obtained from the case study and careful consideration of the results of the pain questionnaire, the following patients were considered as those that needed urgent attention from the doctors;

- Patients with no effect on their pain after taking medication (Figure 5.12),
- Patients having interferences with daily activities such as sleep, work, and mood (Figure 5.14-15, 5.17-18),
- Patients with constant pain (Figure 5.13)

- Patients with extreme pain (Figure 5.7) and
- Patients with constant aching, burning and shooting (Table 5.4)

Pain and Medication (Figure 5.12)

Medication was seen to improve patients' pain by reducing it as was stated by almost 68% of the participants (Figure 5.12). The WHO (1996) guidelines for the management of pain defined medication as a major tool in reducing pain. However in this study, 31% of the patient had no effect on their pain with their medication. When the RTT finds this I believe it is very important to refer these patients back to the doctor with a suggestion to review the drugs prescribed for the patient.

On the other hand, the patient may not have complied with the prescription and it is recommended that this should be checked first by the RTT before referring the patient to the doctor.

Effect of pain with daily activities (Figure 5.14-15 and 5.17-18)

Pain has a major impact on people's lives; it causes sleeplessness, depression and interferes with normal physical and social functioning of individuals (Pain management services- England, 2009). Pain affects the quality of life of patients especially in cancer patients (Burton, Fanciullo, Beasley, & Fisch, 2007; Siddall & Cousins, 2004; National Institutes of Health State-of-the-Science Statement, 2002) and becomes more persistent as the disease progresses (Zech *et al.*, 1995). Patients with constant pain had interference on their daily activities such as their sleep; work and mood. For such patients, the researcher recommends urgent referral for medical care because of the complex nature of their problem.

The quality of life which is normally referred to as the well-being of a patient (Leplege & Hunt, 1997) includes the patient's mood, the ability of the patient to have good rest and work without interference. When pain however interferes with these activities, it affects the general well being of the patient and sometimes leads to an interruption in the treatment schedule of the patients. Sometimes patients have to stop their radiation treatment and seek treatment for their pain; especially when the pain is unbearable as for (P48) when the RO stopped the treatment and gave the patient medication (Table 5.5).

The results show that 12% of respondents had severe pain with constant interference in their work (Figure 5.14). In Ghana only a small number of the patients in the study population own a private business (patient data from RTD, 2008) and as confirmed in this study only 8% of the patient participants had their own private firm or business (Table 5.2), and could leave their work for treatment anytime they wanted. The majority of patients have to combine their work with treatment and have a greater chance of their pain interfering with work:

...“I have to work and pay my treatment bills, children school fees ...I wish it treatment was free...” (P90, 4/5/09).

The National Health Insurance Scheme (NHIS) in Ghana which was introduced in 2005 does not yet cover the costs of radiotherapy treatment though efforts are still on going to change this. If the cost of treatment was covered by the NHIS or was free, the majority of the patients would not have the additional worry of working to get money to pay their medical bills. This would potentially reduce the pain of many in this category since work generates fatigue and fatigue affects the quality of life of patients (Smets, Visser, Willems-Groot, Garssen, Schuster-Uitterhoeve & de Haes, 1998).

Another important finding about pain interfering with work was the 9% (7/78) of the patient participants who stated that, they were unemployed because of pain (Figure 5.4). This will generate much pressure and psychological trauma on these affected patients since their working or trading was their source of income generation (P90, 4/5/09). For most patients, the thought of losing their job was a burden to them especially knowing that their life depended on it. Some of them were therefore prepared to work irrespective of their pain and even tolerated severe and constant pain but kept working. For these patients, referring them to the ROs could help them.

The sleep of 58% of the patients was affected by their pain (Figure 5.18). Sleep is an important aspect of every living being and is needed by everybody. According to the National Sleep Foundation (NSF), sleep is essential for a person's health and wellbeing, (American Psychology Association, 2010). A study conducted by the American Academy of Sleep Medicine (2009) suggests that sleep problems lead to

increased pain and fatigue in cancer patients. Their results indicated that any treatment aimed at helping the patient to sleep could be expected to improve both pain and fatigue in this patient population.

When a patient's ability to sleep is impeded by pain, it becomes an unpleasant situation both to the patient and the care-giver. From the results, almost 39% of the patients had severe pain which affected their sleep. Referring them to the doctor for review and possibly for medication to help relieve their pain and to prevent escalation of their pain is important. The outcome will also lessen the burden on their care-givers and help them to have enough rest while the patient is asleep.

From the results, 5.6% of the patients stated that their mood was affected by the severity of their pain (Figure 5.15). These patients with pain interfering with their mood had extreme pain and needed urgent attention. It was an important learning for the researcher that patients could be moody because of their pain. Through this study the RTTs and the entire staff were informed that when patients are in severe pain it can affect their mood and their behaviour towards them irrespective of how nice they are to them.

Patient with constant pain

Patients with pain all the time were seen as fitting into two categories. Firstly, pain all the time could imply chronic pain which never goes away. Chronic pain can be classified into either persistent pain or breakthrough pain (American Cancer Society, 2007). Persistent pain can range from mild to severe and it is patients in the latter category that are considered to require urgent care because they might have been with the pain for a long time, even before they were referred for treatment. Also it indicates that any previous treatment for their pain had failed. Secondly, pain all the time was the answer of some patients when they had pain from the duration of their treatment until the onset of the pain assessment.

Patients with constant pain are considered to be in the patient group who need immediate medical attention. This is because in these patients the pain dominates their life rather than the disease or the illness that causes the pain (Pain management services-England, 2009, Doctor for Pain, 2008). It is therefore the duty of the RTT to

ensure that such patients have access to the right treatment as early as possible in order to relieve them of their pain if at all possible.

Patients with constant aching, burning and shooting pain were considered to require urgent care because their condition is seen to be serious. Pain may distress the patient and lead to an interruption in their radiation treatment if they are not referred in time. Nerve pain caused by damage to a nerve or pressure on a nerve is often described as burning or shooting (HealthHype, 2009). Patients with constant burning and shooting pain were considered as those with nerve pain. By referring a patient to the doctor, RTTs will help prevent any further damage to other unaffected nerves and by so doing prevent any future continual pain. Bone pain is often described as aching (Cancer Research UK, 2007) when the cancer spreads to the bone and the growth of the cancer within the bone damages the bone tissue and causes the pain (National Comprehensive Cancer Network, 2005). Patients with constant aches were considered to have possible bone pain that required immediate medical attention.

The RTT's role in category one (6.2.1) was identifying patients' problems and referring them immediately to a doctor. It is possible that the RO may not know the condition of their patients given that they see them once a week or less. On the other hand, RTTs have established a patient-RTT relationship and spend time on a daily basis with patients during their treatment. Through continual assessment of patients, RTTs would know more about their patients and their problems and be in the best position to identify any change (whether negative or positive) and to refer them when needed. This improved patient care would improve the service to our patients.

Patient with extreme/severe pain

Thirteen percent of the patients had extreme pain located in only one site, and of the 19 patients who had pain in more than one site, 6 had extreme pain (Figure 5.7). Acute pain is pain that is short lived but can be described as severe (National Comprehensive Cancer Network, 2005). If it is from the radiation treatment then pain generally begins a few weeks after the start of the treatment and peaks towards the end of treatment (Wells 1995). By referring these patients to a doctor, they could receive care that to some extent would reduce their pain if not eradicating it completely and it would also help to prevent the pain from becoming aggressive and

persistent. This is because early intervention may prevent pain from becoming persistent (Pain management services-England, 2009).

6.2.2 Category Two: patients on “watchful waiting”

Careful analysis identified the following patients to be those who could wait till their scheduled review date to see the doctor but with the inclusion of a note in their folder about their condition and pain assessment:

- Patients who described their pain as moderate (Figure 5.14-5.19) and
- Those who described their pain as discomforting (Figure 5.7).

In order to reduce workload on the few doctors in the department and reduce patients waiting time the investigator identified a category called “*Watchful Waiting*”. The RTT role for this group is daily monitoring to take note of any changes in the patient’s pain and give reassurance to the patient.

Following the suggestion in the focus group interview, RTTs decided to take responsibility for this role on a trial basis during this study. They were therefore assigned to these patients and their duty was to carefully observe them for any possible change in their pain, and to report to their study team (made up 4 RTTs). This section was the ‘watching’ aspect of the process.

The ‘waiting’ aspect was the responsibility of the patients to patiently wait till their review date was due. Patients were informed to report to the RTTs on duty if they noticed any change in their condition. Patient participants were assured by the RTTs and were given explanations as to why they had to wait. Explanations given included the fact that the number of doctors did not allow for them to see everyone and that even if they attempted reviewing everyone with a problem; it was not going to be possible.

They were also told that doctors wanted to have quality time with each patient and be able to listen to everyone, hence if they rushed and saw everyone this would compromise on the quality of care. They were also told that their waiting time would be long if doctors attempted to see everyone and that selection of who goes to see the

doctor was based on the severity of pain beginning with patient with extreme pain and ending with those with mild pain.

Another explanation given was that the RTTs in charge of their treatment were capable of managing their pain for that period. They were also told that RTTs were ever ready to listen to them and help them until their scheduled time was due. Those who insisted on seeing the doctor were however referred. These categories were selected by the RTT because moderate and discomforting pain were not as serious as extreme and constant pain.

6.2.3 Category Three: patients to be managed by RTTs

The final category is the group which the researcher considered that RTTs could manage until any change in their pain occurred.

- Patients with mild (Figure 5.7) and occasional pain,
- Patients with pain from radiation treatment,
- Patients who state factors that help them cope with their pain and
- Patients who indicate that position affects their pain (Figure 5.10).

Patient with mild and occasional pain

In this study patients with mild pain were managed by the RTTs. This decision came up during the focus group interview with the RTTs. From the data gathered from the comments of the patients who described their pain as mild in Figure 5.7, it was identified that the majority of them were suffering from chronic pain and had lived with it for a minimum of several weeks before the onset of the radiation treatment. According to Leaver (2002), chronic pain refers to pain ranging from mild to severe and lasting for a long time.

Patients with mild pain were reassured continuously. They were introduced to the RTTs in charge of their treatment whose duty was the daily monitoring whenever the patient came for treatment. They were also educated about their pain and given psychosocial interventions such as provision of information that was intended to make them think differently about their pain and constant communication about their pain (Syrjala, *et al.*, 1995). From the focus group interview, a conclusion was drawn

that indicated that it was not likely that mild pain could affect the patients' treatment regimen. One of them stated it this way:

... Patient with mild pain will not cause a problem to us, after all, they can do everything by themselves unlike the others who can't even climb the stairs unto the bed ...I believe we can just assure and observe them since it's not so serious... (Pr 2, 15/05/09).

Likewise, patients with occasional pain were selected as part of the patient participants that were cared for by the RTTs since they were seen to be healthier and physically stronger than those with severe and frequent pain. These patients, through the pain assessment, were interviewed by the RTTs who got to know more about their condition and also at what time in the day they had pain. The interview with the RO also revealed some level of confidence in the RTTs to manage some of the patients:

...It is not every patient that you have to refer to us; I believe some of them you can find out about their problem and use your judgment on who sees the doctor and when... (Pr 5, 24/04/09).

Patients with pain from radiation treatment

Patients with pain from radiation treatment were also managed by the RTTs. Of the 50% of the patient participants recruited from the treatment section, 70% were observed to have pain as a consequence of the radiation treatment.

During the case study, an interview with the RO revealed that doctors were aware that a lot of patients had severe reactions to the radiation treatment and that this was causing excessive pain to them (Pr 5, 24/04/09). The RO attributed the severe reactions to the fact that the majority of the treatments are not planned (Pr 5, 24/04/09). In a focus group discussion with the RTTs, a similar conclusion was drawn. The suggestion by the RTTs is that RTTs must insist on patient plans before performing any treatment so as to minimize the side effect of treatment (Pr 1, 15/05/09).

Education and counselling in the form of advice and suggestions were given to the patients by RTTs regarding how they could cope with their pain. Patients who were in

the final week of their radiation treatment were reassured and encouraged to complete their treatment.

During the pain assessment, a comment from a patient participants (P11, 5/06/09) revealed that some patients do not really understand the explanations given to them by the doctors during the signing of consent prior to treatment. They confused the side effect of the radiation with pain. For instance P11 had diarrhoea as a side effect of her radiation treatment to her stomach but stated that she had pain in the stomach.

This issue was further discussed by the RTTs in the focus group and the conclusion was that RTTs should repeat the information to the patients during treatment in order to be sure that patients understand everything about their treatment and the expected possible effects of the treatment. By so doing our patients would be thoroughly aware of their condition and cope better with any pain unless very severe.

Patients undergoing concurrent chemo-radiation treatment who also fall under this category will be given special attention of monitoring because chemotherapy can generate its own pain response.

Presence of factors that either increase or decrease pain

Some of the patients stated factors that made their pain either better or worse. For example, some patients stated that drinking water, applying ointment, cushioning the abdomen with cloths, prayer, using hot towels, bending and lifting of hands made their pain better. These factors listed by the patient participants are also normal daily advice that RTTs, as part of their duties, recommend and suggest to patients undergoing radiation treatment. RTTs could therefore take the responsibility of going through the list with patients again. If that is what makes their pain better, repeating them by the RTTs will serve as a therapy to them.

For instance, patients with head and neck cancers are always encouraged by the RTTs to drink more water to avoid dry mouth during the treatment. Those receiving radiation treatment to their lower and upper abdomen and with a huge mass in the area of the disease are encouraged to use a cushion when lying down or sitting. Those receiving treatment on their thorax are advised to wear loose clothing in order to reduce skin contact with the area being treated and allow free-flow of air. Others who

have spiritual beliefs about their disease and pain are constantly encouraged to pray with faith for their healing and have confidence in the treatment. They are also advised not to stop treatment but are counselled to complete their treatment.

Factors that participants listed that made their pain worse were stress, working, eating of spicy foods, tiredness, passing out urine and coughing. Similarly, these are amongst the items that RTTs normally encourage patients to avoid during treatment. For example RTTs advise patients on treatment to have enough rest and not to be involved in much work which could stress them during the day. They also counsel patients with cancer of the stomach to avoid eating spicy food, since it will affect them and cause pain as stated by P86 (24/06/09).

In all, RTTs will use the information from the pain assessment to deal with individual problems through advice and suggestions to the patients and their family members. Family members and relatives will be educated on how to care for their relatives at home and how to help them cope with their pain.

Effect of patients' position on their pain

The position of the patient participants included set-up and treatment positions, posture during sitting and standing as well as their ability to walk. As was observed by the researcher during the case study, patients with huge masses of tumour in the area being simulated and treated had problems with some positions which increased their pain.

Patients who stated that standing, sitting, lying down and walking either decreased or increased their pain were considered by the investigator through the focus group interview as those RTTs can manage. Lying down was seen to increase the pain in 54/90 of patients. Similarly, 28/90 and 18/90 stated that sitting and standing respectively increase their pain (Figure 5.10).

The study site treats lots of patients with advanced cancer and these mostly presents with huge tumour masses at the site of the disease (Patients data from RTD); hence positioning them for simulation prior to treatment and during treatment is a challenge for the RTTs until the mass disappears completely or reduces in size.

RTTs major concern for patient is that they remain in the same position throughout the treatment in order to achieve accuracy in dose delivery to the target area. Patients receiving radiotherapy for various cancers mostly lie supine or prone, and although patients may suffer from pain from the side-effects of the radiation treatment of from their disease (Wells, 2003), the radiotherapy itself is not painful (Cox & Davison, 2005). A comfortable treatment position in radiotherapy may therefore promote patient stability and contribute to the best possible patient experience (Cox & Davison, 2005). There is the likelihood that patients may move if they do not feel comfortable, thereby reducing the precision of treatment. A comfortable position would therefore be useful when selecting a treatment position for patients especially those in pain.

Through this study, RTTs got to know various positions that were most appropriate for their patients during the period of radiotherapy.

Patients who had problems with lying and sitting down were seen to be standing while there were empty seat in the waiting room. After assessing these patients, it was noticed that most of them were ignorantly applying ointments and concoctions to their tumour and the affected area before they presented to the hospital in a worse state.

From observation, most of the patients with prostate and cervical cancer had difficulties in lying down because of their pain; hence they preferred other positions than lying down when they are not on the treatment bed.

Likewise, patients with head and neck cancers, who had either a tracheostomy tube or had reacted to treatment with wet desquamation, had difficulty in lying down with their head on the head support. Patients in these conditions were seen to be holding their head or their neck during RTTs positioning in an attempt to lie down (P13, 9/06/09). For these patients with difficulty in lying down, the onus lies on the RTTs to understand their conditions and give them the best support possible.

Breast cancer patients on the other hand, mostly preferred lying down to other positions especially those with intact breast. One of the patients indicated that they are able to hold their breast upwards and allowed free flow of air around the area

when they lie down, thereby preventing pain (P65, 17/06/09). To further explain this, patients with intact breast react under their breast. RTTs constantly advise breast patients not to use brassieres during the period of radiotherapy, so as to prevent heat around the affected breast and further prevent friction and increased pain.

RTTs will support patients in such conditions with the best position during simulation and treatment which will further reduce patient's pain and make them comfortable.

In figure 5.11, 40/90 and 17/90 indicated that walking and exercise respectively increased their pain. In Ghana, patients who stay close to the hospital normally walk from their homes to the department for treatment. Others that travel by bus are dropped at the bus station and have to walk for about 1.5 km to the department.

The radiotherapy department is an outpatient department and has no admission beds for patients unless in an emergency. Hence it is possible that though a patient has pain during walking, they have no other option. One may be tempted to think that pain must increase with walking but as it was seen in this study; 40% of the patient participants had no change in their pain with walking whilst almost 16% found that walking reduced their pain (Figure 5.16).

Also from the study, 73% of the patient participants had no effect on their pain with exercise. From the focus group interview, RTTs decided to advise patients to avoid exercise if it increased their pain.

In summary, the RTTs role in the assessment of pain among cancer patients should be:

- Assessment and reviewing of patients with pain,
- Referring patients who needed urgent medical attention to the doctor,
- Repeating information to patients during radiation treatment,
- Daily monitoring of the patients especially those on “watchful waiting”, and patients receiving chemotherapy concurrent with radiotherapy,
- Contributing meaningfully within the multidisciplinary team in the management of pain,
- Giving assurance and reassurance to patients with pain,

- Promoting planning as a routine practice in the radiotherapy department,
- Educating and counselling patients and their relatives or care givers,
- Providing appropriate positions during simulation and treatment for patients with pain and
- Recommending positions to patients to help them to cope with their pain
- Advising carers and family members on ways in which they can contribute to the management of the patients' pain.

6.3 Why RTTs should assess pain

The role of the RTTs in Ghana at the RTD encompass simulation, preparation of customized blocks and cast, delivery of treatment as well as attending weekly review meetings organized by management to evaluate patients' response to radiotherapy. The workload of the ROs is very heavy and as a result patients waiting times have increased if they need to see the doctor before receiving treatment. The increased workload is due to the many referrals to the department from all over the nation and beyond as a result of the increase level of awareness of the public about the disease.

Medical personnel have come to acknowledge the benefit of radiotherapy in cancer patients and are referring more and more patients from all hospitals in the country. Patients' needs include psychosocial needs as well as physical needs and so extending waiting times can cause psychological stress to them and in response can manifest as aggression and violence on the staff and sometimes on other patients (Stelmach, 2002). Patients understandably expect a good service that includes a reasonable waiting period during review and treatment.

With the increasing number of patients to the RTD, increasing workload of the doctors, increasing patient waiting time, decreasing level of satisfaction of care and a fall in the standard and quality of care given to clients, it has become evident that RTTs (who are also increasing in their numbers recently) could contribute positively to the situation by extending their role in order to improve the quality of care to patients. One important role identified by the investigator is the assessment of pain because pain according to the data base in RTD in Ghana and through this research was the most frequent complaint associated with patients with cancer in Ghana. Including this in the role of the RTTs will provide a patient-centred service that offers

a supportive environment for our patients with pain, provide improved job satisfaction for the RTTs, relieve the load on other staff and ultimately benefit all parties.

Role extension implies supplementary skills and responsibilities that extend beyond the statutory responsibilities and competencies at the point of professional registration (White & McKay, 2003; Dimond, 2002). Extending the role of the RTTs in Ghana to include assessment of pain in cancer patients will help improve the knowledge base and skills of RTTs as it will give a good cause for further learning and training into the newly developed role and will motivate for acquiring new skills and competence related to the management of pain.

Role extension will improve the quality of care at the RTD for the patients (Lunday, 2005) and further reduce patients' waiting times as RTTs will begin to take on the management of pain in their patients and therefore, will aid faster delivery of treatment without compromising on the quality of care.

Extending RTTs role will also give appreciation of the current and future role of radiographers and their career development and enhance future recruitment and retention of radiographers in Ghana, as seen by the National Health Service in Scotland, (2006).

Role extension will finally bring recognition of the profession which will positively impact all radiographers in Ghana since much has not been seen or heard about the career progression and role development in the profession and only nurses and other professionals are always holding conferences and attending CPD activities towards role extension in their career.

In the assessment and management of cancer patients in this research, RTTs were in the fore-front and the contribution to the patients was enormous; hence by including pain assessment formally to their existing roles, it will help the multidisciplinary teams' management of cancer pain.

It is important that all stakeholders involved in making this a reality recognize the pressing need of this role at such a time as this when patient care is our priority. With

increasing numbers of patients in the RTD and to date not even one more RO being added to the three in the nation, I believe there should be no delay; the best time to act is “NOW”

Role extension will however not be achieved and realized if the knowledge base of the RTTs remains the same, hence several structures have been recommended in this research to upgrade RTTs knowledge. Even students who are yet to take on the course in radiation therapy in Ghana have been included in the recommendations should this role extension be formally introduced.

6.4 Challenges from the research project

The RTT in taking on the role of assessing and managing patients’ pain is challenged by several factors. From the onset of the pilot study, translators had to be searched and prepared before using them as interpreters. This was one of the major challenges to role extension since it took much of the researcher’s time in explaining the whole process of the study to them. In the course of the data collection, the lunch time of some staff members were sought in interpreting patients’ pain to the investigators and in each case provision of lunch was arranged by the principal investigator. Other people other than the staff in the department who assisted in the translation including patients’ relatives and even other patients were given either money or lunch package by the principal investigator as a token for their time spent in the study.

Another challenge was the extra time that was spent on patients who could neither read nor write in English. Investigators had to feed the information and responses obtained from clients unto the questionnaire provided to them depending on their level of illiteracy and assist them in thumb printing their forms. Averagely 20 minutes was spent on each patient but where the assistance of translators were required, investigators spent more than 30 minutes on a patient. According to the translators and interpreters, the extra time spent in explaining questionnaire was not recorded by any of them and it is even possible that more time was spent than what was reported.

Other factors include;

- Language barrier,
- Time,

- Lack of clearly defined description of pain,
- Doctors and
- Attitudes of some RTTs

6.4.1 Language barrier

Language barrier was the major challenge observed in this research. Indeed efforts were made to combat this problem since it has been a challenge to similar studies in the past (Scottish Intercollegiate Guidelines Network, 2000; Greenwald, 1991). In the selection of the co-investigators language was considered because it was anticipated by the principal investigator that several patients with different languages would be referred to the RTD. This was considered because a study conducted at the same study site by Kyei *et al.*, (2008) saw patients from different regions in the country with different languages. Also from the database of the department between 2000 and 2008, it is seen that patients who were referred to the department spoke diverse languages. However even though efforts were made to combat this, it was still a barrier in this research.

The department in Kumasi, Ghana is still not well equipped with equipment even though it is operational; therefore the majority of the clients from the northern sector choose to come to Accra for treatment. This also became a contributing factor to this barrier since none of the co-investigators understood their language.

In Ghana, nine languages have the status of government approval to be used in the country: Akan, Kwahu, Nzema; Dagaare/Wale, Dagbani, Dangme, Ewe, Ga, Gonja/Kasem (Ghana Home, 2009). The hospital also serves neighbouring countries who also speak different languages including French. Among these languages, the investigators could speak the Akan, Ga, Kwahu, Dangme and Ewe but the northern languages were a real problem.

Interpreters were sought by the investigator as assistants to help translate the questionnaire into various local languages. Some of these interpreters were staff of the department, relatives of patients and even patients themselves who could speak several languages. According to R4, a patient was even used to help in the process.

... At some point I became frustrated and had to use one of the patients as a translator which was something I never wanted to do... (R3, 9/06/09).

Fortunately that patient translator was not a participant of the study and therefore did not have any impact on the research. There is the matter of confidentiality but in all cases the patient was asked if the translator could assist.

The danger about language barrier in such a study is that, one can misinterpret information obtained, especially when one has to interpret one local language to another local language and then into English. It is said that before a word goes out from the original person to another person, it will have changed in some way. It is possible that as patients describe their pain to one translator to interpret into English, something would either be omitted or added. One of the patients for example had to speak Ewe to a relative, who also translated it into Twi before I could interpret into English. It is also noted that studies show that family members and relatives of the patients tend to overestimate pain in the patient for various reasons (Elliott, *et al.*, 1996).

Another possible risk of using a translator because of language barrier is that the interpreters could exaggerate some of the feedback from the patients. This could lead to inappropriate information about the patient which can in turn affect the treatment that the patient will receive. For example doctors may prescribe strong drugs that can have severe implications for the patient when they are informed by the RTTs that the patient's pain is severe when in fact it is not.

6.4.2 Time

Almost 57% of the professional participants selected had less than 5 years of radiotherapy working experience (Table 4.1). A potential implication of this short-term nature of their experience may result in a lack of career development for the staff (RTT) (Hogg, Williams & Norton, 1997). This factor, coupled with the busy nature of the working environment and the limited number of staff, may be inhibiting the development of extended role among RTTs. Future studies should consider how the most effective use of RTTs can be encouraged.

6.4.3 Lack of clearly defined description of pain

Pain is said to be *private* to the owners in the sense that no one else can feel one's pain in the same way that one is feeling or experiencing it (Standard encyclopaedia of philosophy, 2009); thus the experience of pain is unique for each person (Helms & Barone, 2008). An interview with the nurse (Pr 6, 22/05/09) revealed that patients are unable to give a good description of their pain. The findings suggest that the ability to understand and interpret information obtained from some of the patients was very difficult. Experiences which resembled pain, such as, 'brrrr' and 'ashhh' which are ordinary jargon words were used to describe pain by some of the patient participants. Such descriptions could neither be explained nor understood. For example one of the co-investigators reported this;

...some of the patients I met couldn't have any appropriate word to describe their pain, some used some jargons which I understood but I couldn't translate them into English, or even in the local language....One patient said I fell like 'brrrr', and another said 'ashhh', and 'hooo'... (R4, 1/06/09).

According to the nurse (Pr 6), some of the patients especially the elderly, out of anxiety and fear could not give concrete information about their pain. Phillips, (2007) in her article on "pain assessment in the elderly" stated that an unintentional poor pain assessment could occur when patients falsely believe that pain is a normal process of aging.

Those patients who were in severe pain and felt dejected and even thought they were going to die were so frustrated that asking them questions about their pain was a bother to them even though they had consented willingly to participate in the study. This was also a challenge to the study because patient's responses to the questions asked were sometimes affected by the nature of their pain and the severity of their pain.

Others were so nervous about their treatment and were using the time which was allocated for pain assessment to ask their own personal questions about the treatment. Some were psychologically distressed with the fact that they have pain and cancer at that stage of their life. Some of the patients used the time to narrate to the

investigators the history of their illness instead of their pain. An example of how patients related the start of their pain to a life event was one patient who said:

...I had to take care of their children... but this pain which started two weeks ago...(P7, 10/06/09).

And another patient:

...I was going to work three weeks ago when I noticed that I couldn't walk as fast as I used to and every step I took resulted in pain... (P50, 10/6/09).

The investigator recorded the information about the duration on the questionnaire and the other comments were noted as field notes. These comments to some extent describe how patients gave their answers and if one is not attentive and does not listen carefully to them, one may not obtain the needed answers for the questions that were asked.

6.4.4 Doctors

Specialist doctors have been identified by many radiographers as barriers to extended role in radiography (Price & Le Masurier, 2007). During the study, patients that were assessed by the RTTs and needed immediate attention were referred to the doctors on that same day. This was because after assessing them the investigator had to help those who needed urgent attention (Table 5.2). It however came out that some of the patients (P31, 11/05/09; P71, 12/06/09) were referred back to the investigator by the departmental assistants and were not attended to by any doctors as requested. Some of the reasons given by the doctors when consulted verbally on the phone by the researcher were because of a heavy clinic they had during the day and the fact that there was too much of work already. One of them (Pr 5, 11/05/09) stated not being pre-informed and exhaustion as the reasons for not seeing the patient.

The department has two ROs and three medical doctors managing all the patients; hence there is a heavy workload on the doctors. Even though the researcher was satisfied with the reasons given by the doctors and understood them, he still felt that something should have been done for the patients. The burden was now on the investigators who had initially assured and promised these patients that they were

going to see the doctor. The researcher had to spend time to explain to patients why they had to wait for the next day.

6.4.5 Attitude of some RTTs

As much as the majority of health professionals support role extension in their various fields, it has been identified that lack of interest and resistance to change by some radiographers has contributed to barriers to extended role in the profession (Society and College of Radiographers, 2008). It was very surprising when it was reported that one of the RTTs who initially supported the idea of pain assessment by the RTTs was reluctant to help a patient (P10) that was referred to him by one of the research assistants (R4, 30/03/09). Through the report, a patient who was simulated earlier on before the commencement of the study needed a re-simulation before treatment because she developed sores from the tattoo that was done on her between the period she was simulated and the time she was supposed to begin treatment. The patient was not able to lie supine as was originally planned because of the pain generated from the sores and was re-scheduled for simulation in prone position in consultation with the RO in charge of the patient.

The additional job created through the pain assessment became a worry to the RTT on duty at simulation. The co-investigator (R4) who assessed the patient re-assigned the patient to a different RTT to simulate. This became a challenge to the RTTs role extension in pain assessment and management since it generated some sort of misunderstanding between the co-investigator and the RTT on duty at simulation.

The same person commented on the pain assessment in this form;

... pain assessment is not a formal role to me...I don't think I'm going to bother myself with it or even attend to patients in pain...After all my pay will not change when I do that...I will only refer the patients to the doctors since it is their work... (30/03/09).

This is a major challenge as the RTTs who support role extension and want to develop in their profession must also not further alienate the RTTs struggling with the concept of taking on more work voluntarily.

6.5 Limitations of this research

Amongst the limitations of the research were: inability to print the questionnaire in other local languages, failure to collect data from non-Ghanaians, time and the possibility of bias of the researcher and the co-investigators.

Poor communication between patients and health care professionals due to the language barrier has been identified as barrier to pain assessment and management (Greenwald, 1991). In Ghana, the standard language used for educational instruction is English; hence the questionnaire was printed in English but translated by the investigators to the local languages. However, this study was patient research and not for students; therefore inability to translate and print the questionnaire in other local languages is a limitation of the study.

Similarly, failure to collect data from the non-Ghanaians was as a result of not being able to translate the information into French. The non-Ghanaians who could have participated in the study were excluded because of the language barrier between them and the investigators.

Again, the professional respondents used in the study were working and no single person had time to spare. It was therefore necessary that the investigator had to find a way of creating time in this busy environment so that the necessary information could be obtained from the participants. The RO for instance kept postponing her appointment with the researcher until 24/04/09 when the researcher managed to interview her during her lunch break.

It has been identified that discussing beliefs about pain and educating participants prior to any study will eliminate misconceptions and lead to a more complete pain assessment (Phillips, 2007). Even though consent prior to the study was done, discussing beliefs about pain and thorough education of the patient did not happen due to the time constraint.

6.6 Recommendations emerging from the study

In this section the recommendations from the findings will be discussed briefly. The recommendations were presented to the doctors (ROs and other medical practitioners in the hospital), the management of the hospital, University of Ghana, Ministry of

Health (MoH) in Ghana and the RTTs in support of role extension among RTT in Ghana.

6.6.1 Recommendation for support towards role extension for RTT in Ghana

A proposal is made to the management of the Hospital to support and assist staff training towards the development of extended roles. The acquisition of new skills and knowledge will improve work and keep the RTTs abreast of the changing technological world. Management can liaise with Ghana Atomic energy Commission and the IAEA to help deserving RTTs to further their education in their respective profession. Scientific visits to other well equipped Radiotherapy departments in Africa and other developed countries can also be arranged by the management through the IAEA to enable staff to experience what happens elsewhere as well as develop extra skills in the management of patients. This in turn could positively impact on the nature of service delivered to the patients in Ghana. Management can also encourage monthly CPD activities that will be organized by the RTTs in the department by assisting them with logistics that are needed.

The introduction of Postgraduate diplomas and Masters Degrees in radiography at the University will contribute to encouraging other staff to further their education. This will enable RTTs in Ghana who are willing to further their education to have the opportunity to do so without travelling outside the country. The majority of staff always show preparedness to further their skills and education in order to improve on their work but travelling outside the country and leaving their families and job is most times a struggle. From the researchers' personal experience, further study in Ghana would have been preferred considering the cost and stress involved in studying outside one's home country.

Also, an upgrade in the educational system by the provision of adequate infrastructure and learning materials for the training of professionals will further enhance RTTs training. Throughout the researcher's four years at the University of Ghana, journals and books on radiography were very hard to come by. Moreover, textbooks were limited in number in the library and instruction on how to get journals and articles via the internet was not provided. Supervision was also minimal due to the number of lecturers at that time.

When adequate educational materials is provided and the library is stocked with books, journals and articles, students will come out of school with meaningful information that can be passed on to others.

6.6.2 Recommendation to the doctors

A number of areas were highlighted regarding the quality of care to patients, who are the primary concern in this study. Throughout the case study, one question kept repeating itself. The interview with the RO, the focus group interview with RTTs and that with the nurse all dealt with the question “why patients were reacting severely from radiation treatment”.

The patients who were in so much pain could not explain why this was happening but the RTTs could explain. The lack of treatment planning for some patients which manifests in hot spot/s causes normal tissue to receive high doses, which can result in pain for the patients. Treatment of the head and neck for example, even when planned, generates mucositis and difficulty in swallowing. However, the side effect of radiation treatment is minimized when treatments are planned. At least one can prevent severe desquamation of the skin that causes excessive pain.

The study findings suggest that RTTs are willing to help in the planning of patient’s treatment. Therefore a recommendation of this study is the inclusion of RTTs in the planning of treatments for patients undergoing radiotherapy.

Even though it is evident that ROs have heavy workloads in the department, they can still make time to draw the volumes needed for the planning and leave RTTs and the Physicist to complete the treatment plans.

From the study, it was obvious that the pain of some patients interfered with their ability to sleep at night (Figure 5.18). A number of these patients were working and receiving treatment at the same time. Suggestions are made to the doctors to review subsequent patients in such condition and advise them of possible ways to combat such circumstances. Perhaps medication can be prescribed to give pain relief to the affected patients which will also improve their quality of life. I also suggest that patients with severe pain should be reviewed twice weekly if possible. They can however return to their once weekly review after an improvement is observed.

From the comments generated from some of the patients, it was noticed that some wished they could rest at home and come for treatment but were afraid of losing their jobs if they stayed away from work. Others did not want their condition to be known in their work places; hence they were still going to work. Yet some others were unemployed due to their pain (Figure 5.4). I suggest that for these patients, doctors will help them if they provide a sick leave certificate for the work place. I also propose that this should be part of the department protocol for future management of pain in the department.

6.6.3 Recommendations to hospital management

It was found that some patients were unemployed because of pain and had probably lost their jobs because of their condition and their pain (Figure 5.4). Since it is the management that is in charge of billing patients for their treatment, it is possible that patients in this condition can be financially supported somehow. Management can decide to give them free treatment or reduce their charges. They can also decide to give them the treatment and allow them ample time to pay their bills in instalments and by so doing the department can help more people and not deny people the care and support they need because of money.

6.6.4 Recommendation to the Ministry of Health (MoH)

The MoH has been working very hard to upgrade the various hospitals to a modern and standard form to meet the demands of the people of Ghana. An example is the newly installed Magnetic Resonance Imaging (MRI) and Spiral CT scan in the radiography department of the Korle-Bu Teaching Hospital (KBTH), and the Single Positron Emission Computer Tomography (SPECT) unit in the Nuclear Medicine Department of KBTH. Efforts are still ongoing to purchase a Linear Accelerator (Linac) for the RTD in Accra and I recommend that government speeds up its arrangements for this.

The introduction of a Linear Accelerator will help improve the quality of treatment by increasing skin sparing effect. According to Aaruni Hospital (2010) some of the advantages of a Linear Accelerator over the current cobalt- 60 teletherapy machine in use are; 1) Constant dose delivery compared to Cobalt-60 where the source decays

with time thereby reducing dose output, 2) Photons and electrons making it ideal for deep and superficial tumours but with more skin sparing than with Cobalt-60 and 3) Minimizing penumbra effect which increases scatter of dose and cause a high dose on the skin.

The final recommendation to the MoH of Ghana is to try as much as possible to absorb radiotherapy treatment costs under the National Health Insurance Scheme. During the study, patients commented on the cost of the treatment that resulted in psychological pain to patients. One patient said in her comments;

...I have to trade and pay my bills all by myself, pay my children's school fees and feed my family...I wish the treatment was free...I would have stopped trading...sometimes I don't go to work because of pain (P90, 4/5/09).

I believe there are so many burdens on these patients and the earlier this happen the better.

6.6.5 Recommendation to the RTTs

I want to encourage all RTTs in Ghana to come together as a team to move the profession forward. We can start by strengthening the association of radiographers in Ghana in the form of building new structures and electing new leaders to take up responsibilities. Funds can be generated through the payment of dues and contributions by every member of the association.

Training and development for the RTTs towards role extension

In the past several training programmes have been used and also recommended by professional bodies as very useful in attaining role extension in radiography (CoR, 2005b, Ruchmer and Pallis, 2002). This includes 3Rs (Kawooya, 2008), CPD (Department of Health, 2004), clinical supervision (CoR, 2003c) and preceptorship (CoR, 2003b). In this study additional training has been carefully studied and suggestions are made for four useful methods to help achieve role extension in radiography in Ghana. These are in-service training, mentorship, peer education programme and clinical coaching.

Preceptorship is a short-term process of support and guidance offered to an individual during the first months of a new or significantly different role (CoR, 2004). The purpose of preceptorship is to integrate, support and assist the development of professional competence and to enable the newly qualified practitioner to merge their knowledge and reflect on their practice, thus promoting independence and clinical proficiency (Kaviani & Stillwell, 2000; Section 2.6.1). I recommend therefore that competent and experienced RTTs in the profession should help newly qualified RTTs to merge their knowledge from school with the practice in the working environment.

CPD may also be utilized in training whereby RTTs in the profession will meet once every month to engage in a CPD activity (Section 2.6.3). This will be a good platform to discuss topics relevant to the profession and the challenges of our work. This practise may also be rotated among the RTTs such that each and everyone will have the opportunity to research, study and learn in order to present an activity. By so doing RTTs will be developing their knowledge base and will keep abreast of the changing techniques in a changing world.

The 3Rs

The three 3R's (Re-evaluate, Re-structure and Re-training) (Kawooya, 2008; Section 2.5) aided the researcher in understanding role extension and career development among radiographers in Ghana. It was noted that the study was a form of re-examining the existing roles of the RTTs as it revealed several roles that the RTT plays in the care of patients undergoing radiation treatment. The study considered the introduction of a new role to the RTTs as they were involved in the assessment of pain through administering of a pain questionnaire. The questionnaire was used as a tool by the RTTs to assess patients with pain but it also gave the RTT s the opportunity to know the conditions of their patients better. By assessment, RTTs saw the need in their patients regarding their individual condition which generated empathy in the RTTs to help in several ways... (Pr 7, 19/06/09).

Restructure was considered by the researcher and it was noted that several recommendations regarding the inclusion of the role of pain assessment can be suggested to the authorities to generate restructuring of policy in the department. It

was also noted concerning retraining that education and training program for staff can boost their knowledge in the management of pain and can help RTTs to take up this role (Pr 7, 19/06/09).

One of the RTTs (Pr 1, 15/05/09) in the evaluation stated that work can be improved when RTTs work as a team. According to the suggestions made by the RTTs, evaluation may lead to re-structuring and subsequently result in re-training of deserving members of staff.

Clinical Supervision

Clinical supervision is supervised practice that is used in many professions for the education of students in the workplace (CoR, 2003c; Section 2.6.2). In Ghana, RTTs use clinical supervision to train student therapists during the clinical rotation. The study indicates that clinical supervision by the RTTs could be improved in order to assist students and newly qualified therapists to gain experience in their profession. A more structured approach to clinical supervision is therefore recommended.

In-Service Training

Through this study, the investigator identified “in-service training” as a practise in some departments for the training and development of staff towards role extension (SIL, 1999).

In-service training is the education for staff to help them develop their skills in a specific discipline or occupation (SIL, 1999). It takes place after an individual begins work responsibilities and allows trainees to draw from their work experience. Reflecting on the benefits of “in-service training” RTTs in Ghana may gain much experience when they begin such training.

Mentorship and Clinical Coaching

Mentorship is defined as a satisfying role resulting in positive rewards for mentors which includes professional development, job enhancement, performance improvement, stronger professional commitment, intellectual challenge, increased prestige, and enhanced personal growth (Rogers, Monteiro & Amaury, 2008; Woolnough, Davidson & Fielden, 2006). Another school of thought defines mentorship as the “guidance of a trusted and a wise experienced person to enhance

the development of an inexperienced individual towards their true potential” (Rosser, Rice, Campbell & Jack, 2004).

Relating this to the study, it is recommended that qualified and experienced RTTs will mentor students (through counselling, guidance and supervision) towards competent practice. Each student therapist may be advised to choose a mentor who will guide them through their education.

Like on the football pitch, coaching may be applied by the RTTs in terms of training by the mentors (RTTs) through the provision of guidance and suggestions to student RTTs towards their goal of becoming competent RTTs.

Peer Education

Peer education is an approach, communication and methodology geared towards fostering learning and research among practitioners (Mead, 2009). A suggestion is made to encourage research among RTTs in Ghana and through this to promote role extension where appropriate.

6.7 Other contributions of this research

Apart from the recommendations and suggestions made previously, by the researcher towards the goal of role development, this study concludes with the presentation of a tool for assessing pain in patients diagnosed with cancer. The research design did not anticipate the need for amending the pain assessment questionnaire. However, through the study it became evident that a simpler tool would facilitate the introduction of pain assessment as a role extension for RTTs. This tool captures the vital areas needed in assessing pain in cancer patients.

6.7.1 A new tool for assessment of pain

The need to develop a tool or questionnaire to help assess patients’ pain that will lead to the improved management became evident through this study. Since the recommendation is that RTTs lead this assessment, the RTT participants strongly supported its development and suggested that it could be simple such that all RTTs can use it.

The contents of the tool were generated through the contributions of the research participants including the researcher's reflections. The contents comprised of; patient's identification, site of pain using diagrams, severity of pain and description of pain using simple scales. These formed the pain questionnaire which is a 9-item tool developed by the researcher (Refer to appendix E for the tool):

Item 1: Date: This will inform the doctors, RTTs and any member in the cancer management team when assessment would be conducted. Any delay in patient's treatment in case the patient is not seen on the same day of the pain assessment can be traced with the date. The date will also be useful in record keeping as it will be added to patient's information in their respective folders.

Item 2: Identification number: According to the discussion with the focus group on 15/05/09 and feedbacks from some patients, signing or thumb printing placed an extra burden on the patients and can delay procedure. The RTTs suggested that consent from patients can be obtained verbally while the identification number will be used to make out the patients instead of their names as some do not want their names to mention publicly. It was further indicated by the researcher that patients' identification number will be different from their hospital number in order to allow for confidentiality between the assessor and the care giver.

Item 3: Location of pain: This is in two sections (A and B) and it will provide a detailed diagram for patients to either shade or mark the area in 'A' as well as to state whether the experiencing pain is inside their body or outside in 'B'. It was observed in this research that patients had to specify verbally whether their pain was on the right or left. Moreover, reports from the co-investigators indicated that the patients with head and neck cancers found it difficult to shade the actual area of pain because the area printed on the questionnaire was very small to them.

...Most of the patients with head and neck cancer couldn't shade and mark the location of their pain because the area was very small for them...I think next time we have to give them a separate diagram of the head and neck... (R3, 1/06/09).

The researcher has included other diagrams (separate head, hand and foot) in this tool to enable the future participants to give a best location of their pain (Refer to Appendix E).

The question '3B' was a translated version from "superficial and deep", to 'inside or outside' in order to give a literal meaning to the target population of the study. It was observed the patient population found it difficult to understand the medical term 'superficial' in this study through the discussion with the co-investigators.

Item 4: Duration of pain: It is important to indicate that the questionnaire on the duration of pain was maintained in this tool as question number four. However this has been modified to include days, weeks, months and years. As was noted by the reports of the research assistants:

...I realized from the questionnaire that patient with pain for weeks and days were not catered for because the question on 'duration of pain' was in months and years, I found a way to include this in my subsequent interviews when I noticed... by asking them to instead of allowing them to choose between the months and years...I'm sure that patients who didn't answer this question were justified...Of course if nobody asked them the duration and were suppose to complete it by themselves which was the case, then they would skip it when they find out their duration were not covered... (R4, 1/06/09).

Item 5: This item included in this tool was derived in an article written by Mann *et al* (1984) on Numerical Rating System which was also cited by Jenson *et al*, (1991). It consists of a simple scoring of pain from mild pain to extreme pain in the number of 0-5 with '0' being "no pain" and '5' being "extreme pain" Patients will be asked to rate their pain by scoring them using numbers.

Item 6: Analyzing the role of RTTs in watchful waiting, the researcher included question number six which is a question on how often patients have pain. Participants will have to underline what is appropriate to them. The inclusion of this question will enable RTTs to draw a line in between patients with urgent medical attention and those that can wait till their appointment date is due.

Item 7 and 8: From the responses and feedback of some patients, the researcher included question numbers seven and eight in order to allow the target population to express themselves better. Observations in the answers from patients indicated that patients will give detail information of the pain when given the opportunity to do so. Patients will therefore be given the chance to write anything that either decreases or increases their pain.

Item 9: The final item which is a table developed by the researcher gives several options to the patients. Treatments received in the past and whether it was helpful or not has been listed and given columns for participants to tick. From this research it was observed that some patients were actually receiving other treatments for their pain apart from radiotherapy. The column for discussion was created to give any patient the chance to comment on their previous treatment and also for RTTs to make recommendations when there is the need for referral.

Adesco Pain Questionnaire (APQ) is the name for this tool. This name was derived from the middle name of the researcher which is *Adesi* and 'Co' simply means the Contributions from supervisors and the respondents in the study. The target group for this pain questionnaire are patients visiting RTD and the aim is to determine the factors that cause pain in patients undergoing radiotherapy and manage their pain appropriately. The patients will complete this prior to the commencement of their treatment and the results will be forwarded to the appropriate unit for immediate attention.

Advantages of APQ

- Captures vital information for pain assessment
- Exerts no burden on patient in completing it
- Can be used by newly qualified personnel under guidance
- Not limited to radiotherapy and can be used for any patient with pain
- Require no extra training to use
- Require no signature or thumbprint

6.7.2 Awareness amongst RTTs

Another major contribution made to the radiography profession in Ghana is the awareness of role extension in the profession. I believe that this awareness will give recognition to the profession and attract more students to be interested in studying to be RTT. It will also create respect for the profession and further raise the self-confidence of the RTT in their work.

6.8 Addressing the research questions

In this section, the research questions are re-visited and addressed individually. The questions were; what is the role of the RTT in the assessment of pain in cancer patients, why should the RTTs role be extended to include pain assessment, what are the challenges for the RTT taking on a role in the assessment of cancer pain and can pain assessment become a routine role for the RTT in a busy radiation oncology department?

6.8.1 What is the role of the RTT in the assessment of cancer pain?

To address this question, the researcher reflected on the interactions with the RO, focus group and the entire process of pain assessment through the administration of the 90 questionnaires.

First of all, the assessment of pain in this research was carried out by RTTs using a pain questionnaire. Through the assessment of pain, RTTs were able to identify patients who needed urgent response from their care-givers. They were able to recognize and classify patients into various categories. Those that needed urgent attention were identified and referred to the doctors. Others who had pain but could wait till their treatment review date were monitored and assured by the RTTs. Patients who were in pain but could be handled by the RTTs were also given the necessary assistance. Of these patients, some were reassured and counselled.

Furthermore, RTTs contributed to the management of patients with pain through various suggestions such as recommending appropriate positions for patients to be used at home, providing appropriate positions during simulation and treatment, educating and advising family members and carers who were taking care of patients at home on the provision of care and support to the patients, promoting treatment

planning as a routine practise for all cancer patients as well as giving meaningful suggestions to doctors regarding the care of the patients.

6.8.2 Why should the RTT's role be extended to include pain assessment

All the patient participants recruited for this study were cancer patients and there was a high prevalence of pain as suggested by other studies (Van den Beuken-van Everdingen, *et al.* 2007; Miller, *et al.* 1998; Addington- Hall & McCarthy, 1995). The study also revealed that pain impairs the quality of life of patients undergoing radiotherapy (Burton, *et al.*, 2007).

According to Cleary, (2000), pain assessment would serve two important purposes to the oncology management team; first, because pain can be a symptom of disease, pain assessment may be used to identify changes in the progression of cancer (for example to signal metastasis or complications). Secondly, because pain can be significantly distressing and can have a profound impact on functioning; pain assessment can be used to track possible changes in the quality of patients' lives as was described by Chapman & Gavrin, (1999).

The RTTs role should be extended to include pain assessment because of the ability of the RTTs to detect a change in their patients and also the longer duration the RTTs spend with the patients. RTTs are capable of assessing pain in cancer patients because they always remain aware of their role in providing patient care and take appropriate steps to ensure that they assist patients in feeling comfortable during their radiotherapy. RTTs are caring and compassionate by nature, with good communication skills which can be used in pain assessment.

RTTs taking on a role in pain assessment would reduce the workload of the doctors in the department. The final question asked by investigator during the interview with an RO was “what do you think RTTs can do to reduce the workload on doctors?”

Surprisingly the response was “stop pushing patients on us” (Pr 5, 24/04/09). If RTTs start using their judgment on which patients should go for review and when, it could end up introducing an extended role which would be the comprehensive assessment of the patient and even treatment review of selected patients. Hence, by including pain assessment in the RTTs' role patients will be better cared for and further it will

reduce the workload of the doctors. Helping to reduce doctor's workload at the department will further reduce patient's waiting time and increase patients' satisfaction with the radiotherapy care.

6.8.3 Challenges for the RTT taking on a role in the assessment of cancer pain

The language barrier between the investigators and the participants, coupled with the difficulty in getting the human resource as interpreters became a challenge for the RTT. Again, the short-term nature of the experience of the RTTs together with the busy nature of the radiation oncology department was a limiting factor. Moreover, the lack of clearly defined description of pain due to the multidimensional nature of pain was a factor to reckon with. Finally, the lack of interest and the resistance to change by some staff contributed to the challenges faced by the RTTs.

6.8.4 Can pain assessment become a routine role for the RTT in a busy radiation oncology department?

To address this question, the researcher reflected on how investigators collected and generated the data in a busy oncology department. The conclusion is YES, pain assessment can become a routine role for RTTs in Ghana. The number of RTTs in Ghana is growing and therefore they can take up this role without any compromise on their daily routine duties.

With the tool developed (Appendix E), RTTs can assess patient's pain without any stress and difficulty. The flow of work in the department will not be negatively affected. Pain assessment can therefore become a routine role for the RTTs in Ghana.

6.9 Management of Pain

Medication was effective for relieving the pain of almost 26% (23/90) of the participants. Acetaminophen and Non-Steroidal Anti-Inflammatory Drugs (NSAIDs) relieve pain caused by muscle aches and stiffness, but only NSAIDs can also reduce inflammation (swelling and irritation) whereas Opioids are often used for acute pain, such as short-term pain after surgery. Patients who were already on drugs before beginning radiotherapy were reviewed by doctors if they had to continue with their medication whilst receiving treatment.

RTTs are encouraged to give special attention to patients who were on medication as they could experience effects from the drugs which can have a direct impact on their treatment.

Radiotherapy is useful in relieving pain especially bone pain which is common amongst patients with breast and prostate cancer (Wells, 2003). Treatment with Radiotherapy was seen to be very useful in 41% of the overall patients undergoing radiotherapy. Patients with cancer of the cervix had relief from radiotherapy of their bleeding and abdominal discomfort. Others with bone metastasis were also relieved of their pain.

The most helpful treatments for pain relief suggested by the participants through this research were radiotherapy and medication.

6.10 Areas for further research

A key finding in this research was the fact that 31% of patient participants stated that medications given to them for their pain relief had no effect. This will indeed be a concern and further studies may be very appropriate in order to make a concrete finding on such a matter.

An area which was identified by the researcher as needing further investigation is the fact that the majority of patient participants stated that exercise has no effect on their pain. Further investigation of this will actually reveal the nature of exercise that helps pain management. Exercise was described as the foundation used in the treatment of acute and chronic pain (Doctor for Pain, 2008). However, the exercises described by the patients' participants in this study were not very specific. This study did not seek any further answers from the patients to find out which exercise because of the focus of the study. Hence a further research may clarify the type of exercise.

Finally as this research aims to achieve role extension for RTTs to meet the practice in the developed world, future and further research would help advance this cause. Research in Radiography is still ongoing and I suggest to my colleagues to come together such that we can set the pace in Ghana for others to follow, it is the best time to act.

6.11 Conclusion

In conclusion, RTTs play a vital role in the treatment of cancer patients. In performing their routine duties, additional responsibilities are identified and performed willingly to meet the need of the patients under their care. A specific area of added responsibility is the assessment of pain.

There is no doubt that very significant progress has been made towards role development in the radiography profession in the developed countries, and no one can deny the advancement of practise amongst RTTs in such countries (Kelly, *et al*, 2008). Nevertheless, Africa and for that matter Ghana has not seen much development in the radiography profession as Barare, (2008) reported. However, extended role according to Smith *et al*, (2008), have always developed in a particular locality when the local conditions in that environment have permitted and created a need for it.

I believe that with such initiatives through this research and support from various bodies and stakeholders responsible in this matter, the vision of role extension in pain assessment led by RTT will become a reality. The time has therefore come for every RTT in Ghana to be conscious of this dream having in mind that we are in the cancer management team to help maintain and improve the quality of care given to patients.

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APPENDICES

APPENDIX A1: PAIN QUESTIONNAIRE FOR THE STUDY

DEPARTMENT OF RADIOGRAPHY/ NURSING
FACULTY OF HEALTH AND WELLNESS
CAPE PENINSULA UNIVERSITY OF TECHNOLOGY

Thesis title: Pain assessment: The role of the Radiation Therapist

Name of Researcher: Kofi Adesi Kyei

Name of Supervisors: Prof P. Engel-Hills, Dr Samuel Y. Opoku

INFORMED CONSENT: I am a Masters student in the department of Radiography of the Cape Peninsula University of Technology, South Africa. I am conducting a research project to find out the role of a Radiation therapist in the assessment of cancer Pain. I want to assure you that your rights are protected and that your response to this questionnaire will be treated with confidentiality. No one person's response can be identified either through survey code markings or any other method.

I choose to take part in the above research and I consent to my participation. I understand my participation is voluntary and can withdraw from it at any time and that I will provide my signature or thumbprint upon completion of this questionnaire.

Researcher's signature.....

Date.....

If you have any concern about this study and you wish to contact someone independent, you may contact the following:

Dr Samuel Opoku

Radiographer (PhD)

Radiotherapy Department

Accra, Ghana

Tel: 021-676222

Dr. ...

Radiation Oncologist

Radiotherapy Department

Accra, Ghana.

Tel: 021-676222

Or you can email my Supervisor: EngelhillsP@cput.ac.za

A. General Information

Date:

Patient Number: Date of Birth: Weight

Height: Gender: Age

Educational level:

Marital status: Single[] Married [] Divorced []

B. Employment Information

1 Are you currently working? Yes No

2 Current occupation or last job:

3 Current employment status (please check all that apply):

Employed full-time Employed part-time Unemployed

Homemaker Retired Student Unemployed because of pain

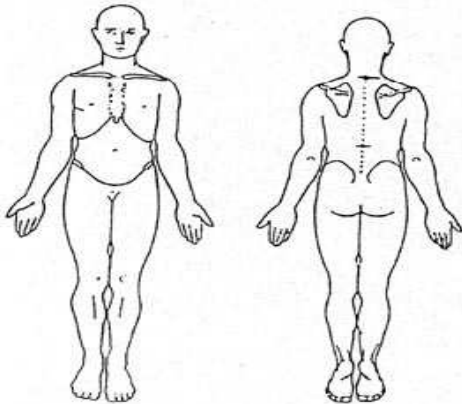
C. Pain Information

1 Why are you seeking treatment at the Radiotherapy Centre?

.....

2 Please describe the location(s) of your pain:

Please mark the location(s) of your pain with an “x” on the diagram below. If whole areas are painful, please shade in the painful area.



1. Is your pain

- a) deep
- b) superficial

2a. Do you have pain

- a) constant (all the time)
- b) intermittent (starts & stops)

2b. What is the nature of the pain

- c) aching
- d) burning
- e) shooting
- f) other

If other please describe.

For the sites of pain drawn on the diagram, give the number that best describes the most intensive pain you have felt during the past 24 hours

0 = no pain

1 = mild

2 = Discomforting

3 = Extreme

Site: 0 1 2 3

Site: 0 1 2 3

Site: 0 1 2 3

3 How long have you had your current pain problem (in years and/or months)?

.....

4 i. How did your current pain start

. ii. Was there a precipitating event?

5 How do the following affect your pain? (Please check one for each item)

	Decrease	No Effect	Increase
Lying down	.	.	.
Standing	.	.	.
Sitting	.	.	.
Walking	.	.	.
Exercise (if applicable)	.	.	.
Medication	.	.	.

6 Are there other factors that make your pain

. better (please list)?

. worse (please list)?

7 How often do you have your pain? (please tick one below)

. Constantly (All of the time)

. Frequently (15 to 19 hours per day)

. Intermittently (7 to 12 hours per day)

. Occasionally (less than 5 hours per day)

8. Circle the number that best corresponds to the phases below.

0 = not at all

1 = hardly noticeable

2 = mild/moderate and constant interference

3 = severe pain and constant interference

My pain interferes with:

- | | | | |
|------------------------|---------|----------------------|---------|
| A) General activities: | 0 1 2 3 | B) Mood: | 0 1 2 3 |
| C) Ability to walk: | 0 1 2 3 | D) Routine work | 0 1 2 3 |
| E) Sleep | 0 1 2 3 | F) Enjoyment of life | 0 1 2 3 |

D. Coping Information

What treatment (including medical, surgical and support) have you had to help you with your current pain?

.....

.....

.....

I believe the information I have provided above to be true. I hereby authorize use of the information provided above for the purposes of research by Kofi Adesi Kyei towards Masters in Technology (Radiography) at the Cape Peninsula University of Technology, South Africa.

Signature/Thumbprint:

Date :

APPENDIX A2: PILOT PAIN QUESTIONNAIRE

DEPARTMENT OF RADIOGRAPHY/ NURSING
FACULTY OF HEALTH AND WELLNESS
CAPE PENINSULA UNIVERSITY OF TECHNOLOGY

Thesis title: Pain assessment: The role of the Radiation Therapist

Name of Researcher: Kofi Adesi Kyei

Name of Supervisors: Prof P. Engel-Hills, Dr Samuel Y. Opoku

INFORMED CONSENT: I am a Masters student in the department of Radiography of the Cape Peninsula University of Technology, South Africa. I am conducting a research to find out the role of a Radiation therapist in the assessment of cancer Pain. I want to assure you that your rights are protected and that your response to this questionnaire will be treated with confidentiality. No one person's response can be identified either through survey code markings or any other method.

I choose to take part in the above research and I consent to my participation. I understand my participation is voluntary and can withdraw from it at any time and that I will provide my name and signature upon completion of this questionnaire.

Researcher's signature.....

Date.....

If you have any concern about this study and you wish to contact someone independent, you may contact the following:

Dr Samuel Opoku

Radiographer (PhD)

Radiotherapy Department

Accra.

Tel: 021-676222

Dr. ...

Radiation Oncologist

Radiotherapy Department

Accra.

Tel: 021-676222

Or you can email my Supervisor: EngelhillsP@cput.ac.za

A General Information

Date:

Patient Number: Date of Birth: Weight

Height: Gender: Age

Primary Care Physician: Education level:

Marital status: Single[] Married [] Divorced []

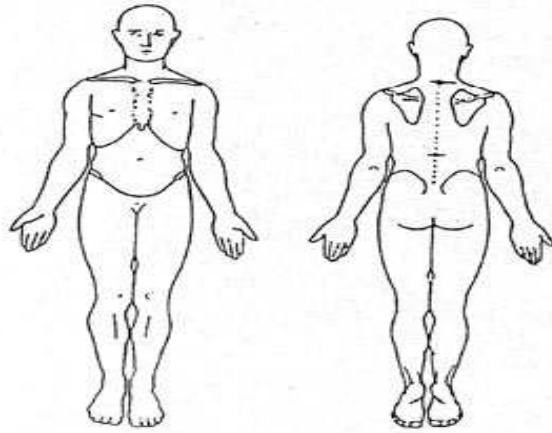
B. Employment Information

1. Are you currently working? Yes No
2. Current occupation or last job:
3. Current employment status (please check all that apply):
 Employed full-time Employed part-time Unemployed
 Homemaker Retired Student Unemployed because of pain

C. Pain Information

1. Why are you seeking treatment at the Pain Management Centre/Radiotherapy Centre?
2. Please describe the location(s) of your pain:

Please mark the location(s) of your pain with an “x” on the diagram below. If whole areas are painful, please shade in the painful area.



Is your pain

- a) deep
- b) superficial

2. Do you have pain

- a) constant (all the time)
- b) intermittent (starts & stops)
- c) aching
- d) burning
- e) shooting
- f) other

If other please describe.

For the sites of pain drawn on the diagram, give the number that best describes the most intensive pain you have felt during the past 24 hours

- 0 = no pain
- 1 = mild
- 2 = Discomforting
- 3 = Distressing
- 4 = Horrible

5 = Excruciating

Site: 0 1 2 3 4 5

Site: 0 1 2 3 4 5

Site: 0 1 2 3 4 5

3. How long have you had your current pain problem (in years and/or months)?
4.
 - i. How did your current pain start
 - ii. Was there a precipitating event?
5. How do the following affect your pain? (Please check one for each item.)

	Decrease	No Effect	Increase
Lying down	.	.	.
Standing	.	.	.
Sitting	.	.	.
Walking	.	.	.
Exercise (if applicable)	.	.	.
Medication	.	.	.

6. Are there other factors that make your pain better (please list)?

worse (please list)?

7. How often do you have your pain? (please tick one below)

- . Constantly (All of the time)
- . Frequently (15 to 19 hours per day)
- . Intermittently (7 to 12 hours per day)
- . Occasionally (less than 5 hours per day)

8. Circle the number that best corresponds to the phases below.

0 = not at all

1 = hardly noticeable

2 = minimal interference but often

3 = minimal interference but all the time

4 = painful but not continuous interference

5 = painful and continuous interference

6 = aware of a lot of interference every day

7 = constantly interferes

8 = severe pain and interference

9 = extreme pain and interference

10 = never free from extreme pain and interference

My pain interferes with:

A) General activities: 0 1 2 3 4 5 6 7 8 9 10

B) Mood: 0 1 2 3 4 5 6 7 8 9 10

C) Ability to walk: 0 1 2 3 4 5 6 7 8 9 10

D) Routine work 0 1 2 3 4 5 6 7 8 9 10

E) Sleep 0 1 2 3 4 5 6 7 8 9 10

F) Enjoyment of life 0 1 2 3 4 5 6 7 8 9 10

D. Coping Information

1. What treatment (including medical, surgical and support) have you had to help you with your current pain?
2. Describe any previous pain and the treatment (including medical, surgical and support) you had.

I believe the information I have provided above to be true. I hereby authorize use of the information provided above for the purposes of research by Kofi Adesi Kyei towards Masters in Technology (Radiography) at the Cape Peninsula University of Technology, South Africa.

Signature/Thumbprint:

Date

Appendix A3: Semi-structured interview questions to the Radiation Oncologist

Date: 24/04/09

Researcher's questions
1. Are you aware that some of the simulation patients do not even know where they have to go on their first day?
2. Why are patients reacting severely to the treatments which result in severe pain?
3. What can you say about the performance of the RTTs on the care of patients in the department?
4. If a patient wants to see the doctor, can RTTs prevent them?
5. What do you think the RTTs can do to reduce your workload?
6. Can pain assessment be included in the RTTs role?

Appendix A4: Semi-structured interview questions to the nurse

Date: 22/05/09

Researcher [I]
1. I was told you were doing a study on pain.
2. Tell me about it.
3. What was the most outstanding observation about pain in your findings?
4. What were the common causes of our patients' pain?
5. What was your approach in the management of the patients?

Appendix A5: Focus-group interview questions with RTTs

Date: 15/5/09

Researcher [I]
1. How can we improve our service to patients?
2. Have you noticed that patients are reacting severely to treatment and are complaining of severe pains?
3. What do think we can do to help them especially those in pain?
4. Can we contribute to management of our patient's pain?

APPENDIX B: LETTER OF INFORMATION

Cape Peninsula University of Technology
Faculty of Health and Wellness
Department of Radiography and Nursing

Letter of Information/Consent

Principal Investigator: Mr. Kofi Adesi Kyei
Department of Radiography
Cape Peninsula University
South Africa.

Student / Co-Investigators

Mr. MS (RTT)

Mr. MO (RTT)

In this study, we want to find out the possible areas that your pain either becomes severe or mild. We are hoping to learn from it so that we can treat it very well. We also hope to find out the way you feel towards your condition so that we can give you the appropriate management.

During this period, you will be asked to answer simple questions about your condition after which you will be asked to give your consent to show that you did it yourself so that we can follow you up for management.

Your participation in this study is voluntary. It is your choice to be part of the study or not and if you decide to participate, you can decide to stop at any time, even after signing the consent form or part-way through the study. If you decide to stop participating, there will be no consequences to you. In cases of withdrawal, any data you have provided to that point will be destroyed unless you indicate otherwise. If you do not want to answer some of the questions you do not have to, but you can still

be in the study and your decision whether or not to participate will not affect your continuing access to services at the department.

We are going to talk about things like pain and we will also ask you for some demographic information like your age and education.

We want to assure you that nothing will happen to you during this period and that you will be in the hands of trained therapist and students under careful supervision.

There will not be any harm or discomfort associated with this procedure and you do not need to answer questions that make you uncomfortable or that you do not want to answer.

We hope to find out the responsibilities of the Radiation Therapist you present your condition of pain to. The researchers may learn more about their role and if possible improve on the care they give you. Not only this but, you will be treated well by your doctor with the information you provide.

The nation as a whole will benefit from the information you provide as it will be documented as part of patients' records at the centre for future management of similar patients.

Anything that you say or do in the study will not be told to anyone else except your care givers for your management. Anything that we find out about you that could identify you will not be published or told to anyone else, unless we get your permission and your privacy will be respected.

The information obtained by me and my co investigators will be kept in your file and will be only available to myself and radiation oncologist in charge of your management. The information will be locked in a cabinet and will not be assessed by anybody.

The information obtained will be kept confidential and will be treated as subject to researcher-participant privilege.

You may obtain information about the results of the study by contacting the researcher or co-investigators.

This study has been reviewed and approved by the Health and Wellness Sciences Research Ethics Committee. If you have concerns or questions about your rights as a participant or about the way the study is conducted, you may contact:

1. Mr T Lebenya
Secretary – Research Ethics Committee

Faculty Office - Health and Wellness

Bellville Campus, CPUT.

Phone +2708 21 959 6917

E-mail: lebenyat@cput.ac.za

2. Dr Samuel Opoku
Radiographer (PhD)

Radiotherapy Department

Accra, Ghana.

Phone: 233-24909083

Email: yooku22@yahoo.com

CONSENT

I have read the information presented in the information letter about a study being conducted by Mr. Kofi Adesi Kyei of Cape Peninsula University of Technology. I have had the opportunity to ask questions about my involvement in this study, and to receive any additional details I wanted to know about the study. I understand that I may withdraw from the study at any time if I choose to do so, and I agree to participate in this study. I have been given a copy of this form.

Signature/Thumbprint of Participant

In my opinion, the person who has signed above is agreeing to participate in this study voluntarily, and understands the nature of the study and the consequences of participation in it.

Signature of Researcher or Witness

APPENDIX C: Ethics approval from Research Ethics committee



09 March 2009
CPUT/HW-REC 2009/H002

P.O. Box 1906 • Bellville 7535 South Africa • Tel: +27 21 442 6162 • Fax +27 21 447 2963
Symphony Road Bellville 7535

**OFFICE OF THE CHAIRPERSON:
HEALTH AND WELLNESS SCIENCES RESEARCH ETHICS COMMITTEE (HW-
REC)**

At the meeting of the Health and Wellness Sciences-REC on the 24 October 2008, approval was granted pending amendments, to K A Kyei, for research activities related to the M Tech Radiography at the Cape Peninsula University of Technology.

TITLE:

Assessment of cancer pain: The role of the radiation therapist

SUPERVISORS:

Internal Supervisor: Prof P Engel-Hills

External Supervisor: Dr S Opoku

Comment:

Changes have been made to the satisfaction of the HW-REC reviewer, 13 February 2009.

This ethics approval is supported by written permission for the study from Dr. V. Vanderpuye, Clinical Consultant/Radiation Oncologist, Korle Bu Teaching Hospital, Accra, Ghana, where the study will be conducted.

Research activities are restricted to those detailed in the amended proposal and supporting documents submitted in January 2009.

This prospective study involves patient assessment and questionnaire completion. Consent will be received from all participants and the ethical standard of confidentiality will be upheld.

Approval will not extend beyond March 2010. An extension must be applied for should data collection for this study continue beyond this date.

A handwritten signature in black ink, appearing to read "Penelope Engel-Hills".

Prof PENELOPE ENGEL-HILLS
CHAIR: HEALTH AND WELLNESS SCIENCES RESEARCH ETHICS COMMITTEE

e-mail: engelhillsp@cput.ac.za

APPENDIX D: LETTER OF PERMIT FROM STUDY SITE

NATIONAL CENTRE FOR RADIOTHERAPY AND NUCLEAR MEDICINE
ACCRA

In case of reply, number
And date of this letter
Should be quoted

Telephone: 021-669202, 676222
Fax: :021-676221

KORLE-BU TEACHING HOSPITAL
P. O. BOX KB 369
Korle-Bu
Accra – Ghana

November 19, 2008

Our Ref:.....
Your Ref No:

Cape Peninsula University of Technology
Faculty of Health and Wellness
Department of Radiography and Nursing
South Africa

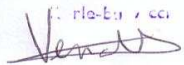
LETTER OF PERMIT

I introduce Mr. Kofi Adesi Kyei as a Radiation Therapist of the department. We permit him to conduct a research on the Role of Radiation therapist on the assessment of cancer pain in patient undergoing radiotherapy in pursuance of his Masters programme in Radiotherapy (M-Tech).

This research is fully supported by the department since its outcome will help improve the overall quality of life of the patient.

All financial supports and assistance is funded by the department and for further enquiries please channel it to Dr. Verna Vanderpuye (vanaglat@yahoo.com)

**National Centre For Radiotherapy
And Nuclear Med**



**Dr. Verna Vanderpuye
Clinical Consultant/Radiation Oncologist**

**APPENDIX E: ADESCO PAIN
QUESTIONNAIRE**

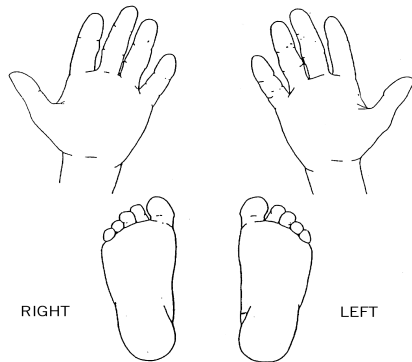
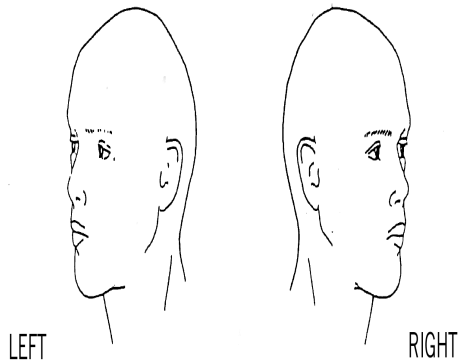
Adesco Pain Questionnaire (APQ)

1. Date.....
2. Patients' ID number.....

3. Pain information

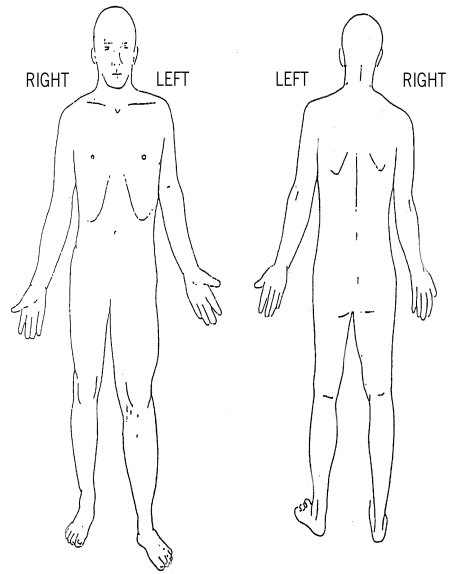
A. Where is the location of your pain?

Mark or shade the area.



B. Is your pain deep within your body or on the surface of body?

Please state.....



4. When did your pain problem start?

Days..... Weeks..... Months..... Years.....

5. Please circle how you feel about pain at the moment with the following;

0 1 2 3 4

No pain mild pain severe pain

6. How often do you have pain? Please underline one.

A. Constantly B. Frequently C. Occasionally D. Rarely

7. List anything (including radiotherapy, medication, exercise, posture etc) that increases your pain.

.....

8. List any factor that makes your pain better.

.....

9. What treatment are you having now? Please check table below and tick

Treatment	Treatment received	Helpful	Not helpful	Patients comments	RTTs comments for management and referral
Radiotherapy					
Medication (Drug)					
Counselling					
Other:					