A MODEL OF NURSING CARE FOR CANCER PAIN MANAGEMENT AMONG ADULT PATIENTS AT GARISSA COUNTY REFERRAL HOSPITAL

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DECLARATION AND APPROVAL

Declaration by the Student

I hereby declare that this thesis is my original work and it has not been presented for an academic award or qualification in any university. Appropriate referencing has been made where the citation of other people' work has been done.

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DEDICATION

My sincere dedication of this dissertation is to all my family members. I am indebted to all my family members for their support throughout my journey to complete this work

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ABSTRACT

Cancer pain is a complex feeling due to sensory and emotional hostile experiences linked with a negative impact on the quality of life of patients. More than 50% of patients with cancer complain of pain hence the need for nursing care model for pain management. Cancer pain in Garissa is a concern due to the limited access to pain management in healthcare facilities. The pastoral lifestyle of the communities exacerbates it.The nursing care model is tailored for such a unique lifestyle in the provision of holistic pain management that is assumed to cultivate care of patients at Garissa County. Phase one was a descriptive exploratory study design. A mixed method approach was utilised to recruit participants that include 94 cancer patients, 84 clinical nurses and 15 critical informants for this study. Various sampling procedures, including random, purposive and snowball sampling were employed to recruit all study participants voluntarily. Modified Brief Pain Inventory (MBPI) tool combined with focus group discussion was used to obtain data from cancer patients. ECOG performance status was also utilised to assess the functional disease progress. Questionnaires were randomly administered to all clinical nurses and Key informants caring for cancer patients to ascertain their knowledge, practice and availability of pain control medications. Descriptive statistics, Chi-square and linear regression, analysed the quantitative information while qualitative data was analysed through the categorisation of themes, a cluster of themes and direct quotes of participants.

The sample population was 188 participants. Cancer patients had mean age 51year with composition of 44.7 % (42) male and 55.3% (52) female. Prevalence of cancer pain was at 78 % (73) with intensity ranging from moderate to severe. A total of 78 % (66) of clinical nurses indicated had no tool for pain assessment, 83.2 %(70) of them did not know how to utilise WHO analgesic ladder. Majority of patients 82 %(78) were on incorrect WHO analgesic ladder for pain management with negative PMI (p-value < 0.05) of under treatment. Majority of patients considered alternative treatment for cancer pain such as Quran recitation and Somali herbs accounting for 65% (61) and 77.6% (73) respectively. Almost all KI 93% (14) indicated the inadequate availability of pain medication.

Phase two entailed the development of “Xanuun” nursing care model for pain management and pre-testing of the same from expert opinion and nurse managers GCRH. Findings from experts showed that 80% of respondents agreed that the developed model captured the challenges of cancer pain management and 60% of them predicted that the model could be utilised. However, 100% of the experts suggested that the model will bring a positive change, though 90% of them upheld that there will be potential challenges of implementing such a model.

This study revealed a high prevalence of cancer pain due to under treatment and inaccessibility of pain medication associated with the dynamic of a nomadic lifestyle. The study found limited knowledge and negative attitude among clinical nurses at GCRH. Thus, recommends the need to implement contextual “Xannun” Nursing Care model at GCRH, for a better approach of cancer pain management

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ABBREVIATION

AIDS	Acquired Immune Deficiency Syndrome
BPI	Brief Pain Inventory
CRA	Commission on Revenue Allocation
ECOG	Eastern Cooperative Oncology Group
GCG	Garissa County Government
GCRH	Garissa County Referral Hospital
HIV	Human Immuno Deficiency Virus
HPV	Human Papillomavirus
NCI	National Cancer Institute
IASP	International Association for the Study of Pain
IARC	International Agency for Research on cancer
KNCCS	Kenya National Cancer Control Strategy 2011-2016
KNH	Kenyatta National Hospital
KNPCG	Kenya National Palliative Care Guidelines
KNCO	Kenya Network of Cancer Organizations
NRCRAP	National Research Council for Committee on Recognition and Alleviation of Pain in Laboratory Animals
PMI	Pain Management Index
RAM	Roy Adaptation Model
UK	United Kingdom (Britain)
WHO	World Health Organization

CHAPTER ONE: INTRODUCTION

1.1 Background of the study

Pain is a repulsive feeling often caused by damaging stimuli on human tissue. The International Association for the Study of Pain (IASP) describes the pain to be a hostile, sensory, emotional and multifaceted experience linked to possible damage of tissue or actual damage or can be described attributed to damage (Juli et al., 2010). While pain may be unpleasant, it is necessary for human survival since it informs us that something is not right, thus an indicator to surrender from a hostile agent (Namukwaya, Leng, Downing and Katabira, 2011). Pain is one common aspect that is complex, subjective and it is associated with declines in human physical health and functional status coupled with lack of emotional well-being, and quality of life (Knudsenl, Klepstadl, et al., 2011).

Historically, ancient Greeks questioned whether pain originates from the heart or the head. Belief systems and interventions guided pain relief were trephination and exorcism (McGeary et al., 2014). For instance, Aristotle explained the feeling of pain as reverse to pleasure, Plato associated pain as pleasure feeling, and ancient Greeks believed that pain stimulation is initiated from the peripheral nerves to central nervous system sensation of a person (Harriet, 2012). Religious faith such as Islam and Judeo-Christian also believe that pain is a test of one's faith in this world as the individual is subjected to suffer (Harriet, 2012). It is, however, noteworthy that pain management existed for many years, for instance, early civilisations of China practised acupuncture, ancient Egypt used opium to relieve pain, and the Romans identified the significance of the nervous system in processing pain ((McGeary et al., 2014)

Subsequently, identifying that cancer patient's experience emotional, physical, spiritual and social dimensions of pain was coined by Dame Cicely Saunders and termed this as

‘total pain (Richmond 2005). Hence pain management is not a new phenomenon in this modern world, yet it is a complex aspect of human experiences that appears undertreated.

Evidence from studies reveals that after the destruction of human tissue by cancer, there is a swift and longstanding change that occurs in the portions of the Central Nervous System that involves in both modulation and transmission of pain (Calvino and Grilo, 2006). According to the Staging System of Edmonton, classification of cancer pain is based on characteristics that are assumed to have a clinical predictive value that includes mechanism of pain that occurs in soft tissue or bone, visceral neuropathic, unknown and mix. There is also an absence of incidental pain, impaired or normal cognitive functions, presence or absence of psychological distress. Usage of daily opioids and presence or absence opioid consumption tolerance of over 5% more than first three weeks of follow up and positive or negative of alcoholism or drug addiction history (Higginson and Murtagh, 2010).

Pain can be of the mechanical type of response that is associated with tumours or chemical aspect that responses to noxious stimulus like substance P, serotonin, bradykinin, prostaglandins and histamine. The pain stimulates peripheral nociceptive receptors that transmit pain through the nerve endings (nociceptors) to the spinal cord via the C fibres and A-delta fibres (Ndegwa, 2013). Additionally, Cancer treatments and diagnostic procedure are also associated with pain (Julia et al., 2010).

On the other hand, cancer pain prevalence may be biased during assessment since pain experience is multifactorial that include emotional, social and spiritual components that influence individual perception to pain.

Thus, cancer pain causes not only physical pain but also involves other dimensional aspects of human functioning taking into consideration the human personality, cognition and social relation (Namukwaya et al., 2011).

Over 50% of cancer patients complain of pain (Ali et al., 2012) and scarcity of trained healthcare professionals in pain management has led to some health professionals in government hospitals to focus on only therapeutic procedures instead of palliative care. However, Uganda made an innovative approach to overcome such challenges by amending the existing narcotics legislation.

Such innovative approaches have allowed specialist palliative care nurses and clinical officers with 18 months of training to prescribe morphine (Namukwaya et al., 2011). Nurses in many rural areas of Kenya lack the skills to assess cancer pain and prescribe opioid-based drugs when even the pain medication is available. In addition, African countries including Kenya, experience lack of specialists to prescribe narcotics like morphine for pain relief (Namukwaya et al., 2011). Thus, a nursing care model for cancer pain management needs to be considered in Kenya, since nurse's form the bulk of healthcare workers (MOH, 2012) in rural areas like Garissa County.

Cancer patients require a model of care derived from palliative care services or hospice setting to manage their pain (WHO, 2014) and even more necessary for nomadic pastoralists' patients who walk for a long distance to get into any health facilities. World Health Organization developed the cancer pain relief ladder based on the use of analgesics, adjuvants, education support and monitoring that is offered by a multidisciplinary team approach (Waweru, Reynolds and Buckner, 2008). The ladder is believed to relieve cancer pain and advance the quality of life for cancer patients (WHO, 1990). Some nursing care models exist at different levels of interventions such as

evidence-based practice, oncology patient education, intervention-based research and palliative care (Vallerand, Musto and Polomano, 2011).

Such models have made a positive impact in cancer patients care of many developed countries through the utilisation of WHO analgesic ladder for pain management. Models of nursing care for cancer pain address three levels of care that include, the prevention of cancer pain at primary level which focuses on preventing environmental aspects that will stimulate or intensify pain. This model will consider a complete array of psychological, biological and social effects of cancer pain using a standardised assessment tool and measurement outcome. Prevention model of cancer pain includes improved self-care of pain, improved knowledge, skills, confidence, routing screening, management of pain, referral system and coping mechanism (Dzau and Pizzo, 2014).

There is also the secondary level of pain care offered by pain specialists that include a multidisciplinary team, providing rehabilitation therapy and behavioural healthcare. The secondary level of pain care is designed to block the alteration of acute to chronic pain that includes effective pain management and proper referral systems. The third level of care in pain is the tertiary level that encourages advanced medicine diagnostic interventions that are focused on minimising the side effect of chronic pain (Dzau and Pizzo, 2014). However, Garissa County lacks a model of nursing for cancer pain management among the adult patients principally tailed to their nomadic lifestyle despite the increasing number of cancer patients at Garissa County Referral Hospital (GCRH).

Adult patients with cancer at GCRH are managed in the general medical and surgical wards. Unfortunately, the staff based on their attitudes, expectations and relationships with patients plan hospital activities. Thus, care provided in the wards is tailored towards a cure and restoring the normal life that is perceived inappropriate by cancer patients

(Mulemi, 2008). The scarcity of research in this area, limited training of healthcare professionals on pain assessment and management has led to health professionals in government hospitals to focus on only medical procedures and underscore palliative pain management (Holtan et al., 2007). Therefore, the study aimed to come up with a nursing care model for the management of cancer pain among adult patients at GCRH that could be utilised by nurses and other health workers.

1.2 Statement of the Problem

Cancer pain has been reported as inadequately managed in various parts of the globe and remains a public concern in health care delivery. A systematic review of the pooled prevalence of cancer pain studies from North America, Europe and Asia over the last three decades was analysed based on four subgroups. The finding revealed that 64% of patients with metastatic and advanced disease experienced pain, 38.0% of all patients reported patients on the treatment of anticancer experience pain as high as 59% of the untreated pain and severe pain with a numerical rating scale of over 5. Even those who have been cured of cancer experience as high as 39.3 % untreated pain (van den Beuken-van Everdingen et al., 2007). However, palliative care services delivered by a multidisciplinary specialist team provide the requirements of patients with cancer-based on the interventional model of care (Higginson and Evans, 2010). Various nursing care models have been developed in developed countries to deliver home care, inpatient hospital care or outpatient follow up care of cancer patients. Such models have considerably enhanced positive outcomes of patients in the aspect of anxiety management, decreased hospital re-admission, pain control and alleviate the suffering of symptoms related to cancer pain (Vallerand, Musto and Polomano, 2011). Nursing care models are also tailored for different settings of cancer patients and are part of care for cancer or oncology patients, though limited in developing countries.

Cancer pain remains poorly managed in many developing countries due to limited resources, the paucity of literature on cancer pain management (Namukwaya et al., 2011) and lack of interventional nursing care models. A Study done at the National Referral Hospital in Kenya reports 66% untreated pain and over 30% with moderate to severe pain (Huang et al., 2013). Other studies also revealed the deprived quality of life in cancer patients at the largest referral hospital in Kenya (Mwanda et al., 2004*)* with the prevalence of cancer pain at 38.5% (Ndegwa, 2013). Cancer patients in Kenya also seek medical attention in the late stage of cancer diagnosis (Ndegwa, 2013). Hence, continued management of cancer pain inadequately, with no focused model of nursing care is increasingly getting worst especially among nomadic Somalis of Kenya in Garissa County. Somalis believe that pain or "*Xanuun"* comes as result of punishment from God, witchcraft, possession by demon or curse and requires interventions of prayers of sheikhs or traditional healers (Maalim, 2006).

While the trend of cancer patients has been on the increase in Garissa County (MOH, 2013 and Hassan et al., 2014) and yet there is no nursing care model for cancer pain management tailored for the pastoral community in Garissa county or counties of similar characteristics in Kenya to address their unique lifestyle. The expected results on cancer pain prevalence at GCRH are higher than 38.5% as by (Ndegwa, 2013) with the increased poor quality of life since Garissa County is categorised as a marginalised area (CRA, 2013) and the County has poor infrastructure, poverty population practising nomadic lifestyle and ill-equipped health services (CRA, 2013).

Likewise, cancer patients in Garissa County tend to visit health facilities when pain is unbearable, and diagnosis is at a late stage of the disease (NCCS, 2011). Late diagnosis is due to inadequate screening services, lack of understanding of early signs and

symptoms of cancer (KNPCG, 2013), nomadic lifestyle that demonstrates less health-seeking behaviours and above all lack of a model of care focused on meeting their needs.

GCRH as a marginalised area has inconsistent pain medication supply, inadequately trained nurses on pain assessment, pain management and limited prescribers of pain medication (Ali et al., 2010). Inadequate supply of medication coupled with socio-cultural practice among the nomadic Somalis and lack of tailored nursing care model for unique lifestyle has resulted in cancer pain management inadequately. Therefore, there is a need to develop a model which will address the primary level of cancer pain management, designed for the requirement of the nomadic lifestyle in varied cultural context. This study, therefore, aims at developing a model of nursing care for cancer pain management among the adult patients.

1.3 Study Purpose

This study aimed to come up with a comprehensive contextualised model for cancer pain management for areas of nomadic-Somali and regions of similar characteristics in Kenya and beyond. Nursing care model is believed to offer high-quality care because nurses take much time with patients on daily bases as compared to the rest of the healthcare team.

The nursing care model in this study is believed to improve cancer pain experienced by adult patients, improve their quality of life and alleviate their suffering as a unique population with unique pastoralism lifestyle. Thus, the model of care is for the management of cancer pain focusing on the needs of the nomadic community in Garissa County. Nurses and another health team to provide holistic cancer pain management can use the model of care.

1.4 Study Objectives

1.4.1 Broad objectives

To develop contextualised model **"Xanuun"** nursing care model of management of cancer pain for adult patients seeking health care services at Referral County.

1.4.2 Specific objectives of the study

1. To determine the prevalence of cancer pain in adult patients seeking health services at GCRH.
2. To establish the practices among nursing workforce utilising recommended WHO analgesic ladder for pain management at GCRH.
3. To establish the social-cultural practices in the management of cancer pain by adult patients seeking Health services at GCRH.
4. To develop an appropriate "Xanuun" nursing care model for cancer pain management of adult patients seeking health services at GCRH.
5. To test the developed model of "Xanuun" nursing care model for cancer pain management of adult patients seeking health services at GCRH.

1.5 Research Questions

1. What is the prevalence of cancer pain in adult patients seeking health services at GCRH?
2. What are the socio-cultural cancer pain management practices among adult patients at GCRH?
3. What are the practices among the nursing workforce in the utilisation of recommended WHO analgesic pain management ladder GCRH?
4. What kind of "Xanuun" is nursing care model appropriate for cancer pain management among adult patients seeking health services at GCRH?

5. What assessment is relevant for the actual implementation of "Xannun" nursing care model for cancer pain management among adult patients seeking health services at GCRH.

1.6 Hypothesis

- There is a correlation between the prevalence of cancer pain and the management of cancer pain among adult patients seeking health services at GCRH.
- There is an association between the effects of cancer pain and the management of cancer pain among adult patients seeking health services at GCRH.
- Expert tested "Xannun" nursing care model has a positive relationship in cancer pain management of adult patients seeking health services at GCRH.

1.7 Justification of the Study

Pain relief is a fundamental human right (Augusto et al., 2013) thus the need for a model for pain management utilised by trained professionals in the nursing field. The contextualised model in the study addresses the unique lifestyle and cultural beliefs of Somali cancer patients who are seeking health care. The model also addresses the need to empower nurses with unique features of this unique population with cancer pain since contextualised nursing care model demonstrates the unique approach of treating cancer patients that require the particular approach of understanding their cultural and religious beliefs in order to provide holistic care.

It has been reported that cancer pain has a tremendously adverse effect on the quality of life that threatens both the physical and psychological well-being of an individual. Uncontrolled chronic pain triggers the pituitary-adrenal axis and overwhelms the system that provides immunity, thus predisposing an individual to low immunity towards other diseases. Continuous, sympathetic activation by pain has adverse effects on important

organs in the cardiovascular, gastrointestinal, and renal systems (Wells, Pasero and McCaffery, 2008). It is now reported that the fifth vital sign that nurses are required to assess, and treat is a pain (Willens, 2005), other than respiration rate, temperature, blood pressure and pulse (Hinkle, 2005). Pain is the main complaint of most terminally ill patients who visit health facilities (Hinkle, 2005) with more than 50% of patients with cancer experience uncontrolled pain (KNPCG, 2013).

Cancer pain also causes anxiety, fear and anger toward both patients and significant others. This study, therefore, rationalised the need for developing a nursing care model for pain management that will be operationalised by trained nurses, who will be allowed to prescribe narcotics for pain control on acquiring special training. In comparison, Uganda has allowed nurses and clinical officers to be trained for 18months in order to improve the prescription of opioids for pain medication in rural areas. However, limited training on pain management in Kenya has led to nurses having reservations on the administration of pain medications, fearing drug addiction or litigation on the prescription of narcotics, thus leading to inadequate pain management of cancer patients in the health facilities (Ali et al., 2013). It is, therefore, necessary to determine and increase nurses' knowledge on pain assessment, diagnosis and appropriate breakthrough of pain to operationalise this care model.

The nursing care model in this study addresses not only the significance of physical treatment of pain but also the need to understand and synthesise aspect of social-cultural practices of pain relief among Somalis. The spiritual aspect that also improves pain relief is appraised. This nursing care model is tailored to guide nurses to plan better patients care delivery based on their nomadic lifestyle. The study assumes that such a care model would be acceptable to all cancer patients, irrespective of their nomadic lifestyle. The

model also considers the fact that cancer patients are prime assessors of their pain who require a multidisciplinary approach and holistic care for pain management.

1.8 Significance of the Study

The importance of this study is to establish a care model that is cognizant of patient-specific health-seeking behaviour as well as social care modalities that address this uniqueness. It is postulated that comprehensive *"Xanuun"* nursing care model for adult patients with cancer in this region would enhance the quality of care and improve patients with concern seeking care services in the Somali region. While many another nursing model of care may exist globally, this comprehensive *"Xanuun"* nursing care model for adult patients with cancer addresses their specific individual needs and their unique lifestyle. This model is designed to support the nomadic adult cancer patients. It is also to be utilised by nurses and other health workers to provide holistic pain management. The Development and implementation of such a model are assumed to improve cancer pain control, thus reducing patient suffering and enhancing the quality of life.

Apart from model development, the findings of this study provide information on the prevalence and effect of cancer pain in adult patients. This model of care is to facilitate and advocate for improved facility and capacity building of nurses and encourage the amendment of current narcotics legislation to permit prescription of narcotics by palliative nurses. Since nurses form the bulk of healthcare workers hence their prescription for pain management medications will minimise patients' suffering and uplift their quality of life. The model of nursing care in this study is believed to strengthen the uptake of palliative services by the nomadic population and improve on drug prescription by making it available through an improved understanding of pain by nurses and other healthcare workers. Furthermore, the *"Xanuun"* nursing care model is

developed on a multifactorial facet of pain assessment which cascaded pain management among nomadic patients.

During the phase of one this study, the level of nurses' knowledge regarding cancer pain training and education was established to identify information for the development of model and gaps for future utilisation of the same. Consequently, the development and implementation of this nursing care model also stimulate the need for a policy guideline for pain management in health institutions, since there is no policy implementation on cancer pain relief, despite the enactment of the cancer prevention and control act of June 2012 in Kenya (KNPCG, 2013). Therefore, this study also aimed to understand how patients with cancer control their pain as influenced by their socio-cultural practices, personal perception and the health institution policies. Other than that, this study was required for an award of Doctor of Philosophy in nursing science, provision of reference materials, and increase the body of knowledge in nursing science and health science in general. Finally, the model of care developed in this study will also stimulate further research in this field.

1.9 Scope of the Study

The main focus of this study is on patients with cancer despite the stage of the disease process at GCRH. The caregivers particularly the knowledge and practice of the nurses on pain management were assessed, and the availability of pain management medication was analysed. The analysis was done to come up with a comprehensive nursing care model acceptable to nurses and their patients with cancer. Cancer patients who participated in the study were those found during the 6-month period of data collection in the hospital, plus those on follow up in the palliative clinic through snowball sampling.

1.10 Limitation of the Study

For any study to overcome bias, the researcher must acknowledge the limitation or expected, or potential outcomes in their study (Polit et al., 2001) and these limitations are out of control of the researcher. There was a limitation of a literature review on nursing care models regarding cancer pain management in Kenya. Some participants were very ill to take part in the study due to pain experienced related to the cancer disease process. Many participants were illiterate, and the researcher or the assistants filled the questionnaires for them, thus introducing bias in the study.

The assessment and measurement tool (BPI) that was used to evaluate pain management may have some limitation, such as lack of therapy compliance by the patient when on pain medication, the route of medication and dosage of the prescribed analgesia, adjuvant drugs, possible drug interactions with other analgesics, and interaction with non-pharmacological approaches. The absence of such feature in BPI introduces bias in the treatment of pain and prescription of pain medication. However, this study adopted a modified tool (MBPI) that considered some aspect of non-pharmacological items in order to achieve the study objectives.

1.11 Delimitation of the Study

Study delimitations are factors that are in control by the researcher (Simon, 2011). However, such features may limit the scope and definition of boundaries. The objectives and research questions of the study only focused on patients with cancer pain, regardless of other comorbidities that may contribute to pain, such as arthritis. The sample size that was used in this study was a hospital-based population and patients neighbouring the hospital area; this excluded the other patients with cancer from the other sub-counties of Garissa County. The study achieved a sample size of 100 patients only. The community-based study population of all sub-counties in the county may have provided a larger

sample size slightly, but due to the unpredictability of security in this area, the researcher focused on the hospital-based study population and the few patients around the hospital neighbourhood. After all, marginalised and sparsely populated areas always have a low population so as the study population in this area.

1.12 Assumptions of the Study

Assumptions are essential relevant, and beliefs in a study derived from its structural process (Simon, 2011). One of the assumptions in this study is that pain management is dynamic and is determined by various factors, such as health care system operations, patient's perception and cultural practices. The use WHO analgesic ladder implementation is believed to relieve pain if adequately utilised, although it is a challenge in resources limited and marginalised area like Garissa county due to lack of a focused model of care.

There is an assumption that a positive relationship exists between psychosocial support and spiritual therapy on cancer pain management thus the need to understand the social-cultural context of cancer patients to come up with the appropriate model.

This study an assumes that a multidisciplinary palliative care units or hospice units with mobile clinics that provide pain management services for adult cancer patients with nomadic lifestyle will adequately control cancer pain. The small study sample of Garissa Referral County Hospital will also represent the marginalised and dispersedly populated area. Hence, the few respondents were believed to have honestly provided the required information that helped to develop a nursing care model for pain management.

Finally, this contextualized nursing care model labelled *"Xanuun"* considers specific sets of social demographic characteristics of cancer patients that include gender, ethnicity and cultural practices, level of income, distance from health facility, type of treatment,

duration of cancer pain, the knowledge of caregivers on pain management have direct relationship with cancer pain relief and perception.

1.13 Theoretical approach

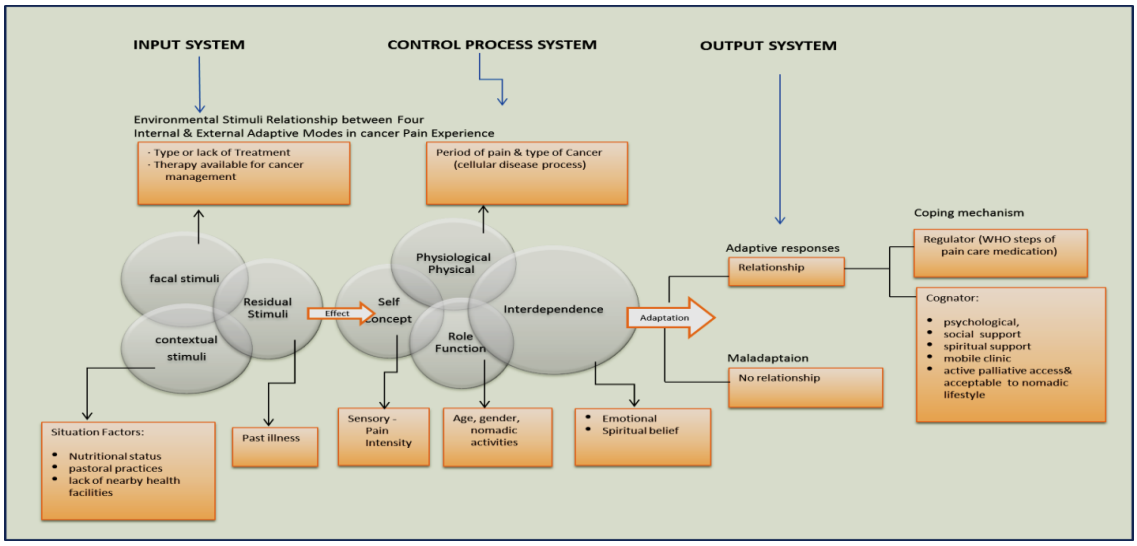
The theory is defined as a set of logical principles or statements intended to structure our observation, understanding and explanation of our worldview. According to Mittwede (2012), there are four main paradigms of research that include critical theory, positivism, constructivists and post-positivism. Mittwede (2013) further explained that all these paradigms had been applied successfully in recent research inquiry. Thus, Paradigm gives the worldviews inquiry and held assumptions or conceptual frameworks that are essential matrices that guide research. Worldview is, however, swayed by the cultural context of our history and this will, in turn, form our world interpretation on the meaning of truth and the forces of creation.

However, the theoretical approach in research influences research design and development of research questions. The theoretical approach also supports methodology and influences data analysis and interpretation and encourages exploring a particular health issue that is already known or unknown (Kelley, 2009). Theoretical explanation in research results in a model that can be can easily be described (Mackenna, 2005) and therefore nursing theories implicate nursing care models.

Nursing models are necessary when providing care to manage cancer pain and improve the quality of life of cancer patients. Nurses provide crucial services (MOH, 2012) and a significant role in monitoring and treatment of cancer patients. Moreover, there are various nursing care models designed for a specific population. However, factors like economic dynamics, leadership styles and the ability to recruit and retain staff will determine the development and operationalisation of any model of care (Fahey and

Miaskowski, 2008). Most nursing care models available are designed for the needs of patients in developed countries where there is access to pain medication. Contrary, a contextual 'Xannun' nursing care model is derived from cancer patients and their primary health caregivers at GCRH that is adopting a theoretical approach of Calista Roy, adaptation theory.

Based on the adaptation theory of Calister Roy, this study applies the constructivism grounded theory approach at developing *"Xanuun"* model of nursing care (Phase Two



of the study). Furthermore, evidence shows that constructivist is a conventional technique for studies in various disciplines such as Education, Nursing and psychology. According to Mills and Francis (2006), constructivism paradigms highlights the independent interrelationship between participants, the reality and the researcher constructing the idea. Constructivism assumes that researchers are part of the study and not just observers. The researchers themselves as an unavoidable part of the study outcome and their value must be recognised.

Figure 1.1: RAM Model: shows the relationships of vary systems according to RAM theory

(Source: Bilal and Nijmeh 2014)

Cancer Patients have open systems that respond to stimuli from the internal and external environment:

- Cancer Pain: this is the patient or person receiving care.
- There is three **input system** in that influence Cancer pain in a person with cancer, this includes:

1. **Focal Stimuli** consist of the treatment procedure that is being received, Advancing stages of cancer and lack of therapy for pain control.
2. **Contextual stimulus** is a situation where the person cannot access pain medication (due to the distance of health facility), limited knowledge/ negative attitude of health care providers, lack of policy/ guideline for implementing pain medication in the institution.
3. **Residue stimuli** are the persons/ patient perception to pain, influenced by past illnesses, person's belief on pain.

- **Control process:** a person with cancer may experience pain in different forms, commonly in four types that include:

1. Physiological pain: kind of pain influenced by the period of pain, type of cancer, adequacy of treatment/therapy for pain control and cellular disease process that subject physical pain to the person.
2. Interdependence is also another control process, which entails, psychological pain that requires therapy, emotional and spiritual belief of the person about pain, adequacy of the psychological therapy and respect for the patient pain.
3. Self-Concept determines pain intensity and stage of cancer of the person. It also includes individual perception about pain and response to pain perhaps influenced by personal spiritual belief.

4. Role function: this includes the socio-cultural factors that determine a person's response to pain, based on their belief, age, gender and societal influence on pain management.
5. Regulator aspect, which is physiological and biological seek early identification of the disease and treatment of cancer disease and cancer pain. It also entails the proper utilisation of WHO analgesic ladder of pain management.
6. Cognate aspect, which means pain is controlled using a range of activities, such as:
    - Spiritual support (Quran reading),
    - Social support using an alternative therapy that is Somali Herbs, Heat massage, Cold Therapy, cupping, burning for pain control.
    - Provision of mobile clinics to enhance the accessibility of pain medication.
    - Train staff on pain management and develop hospital policies/guideline.
    - Setting up of palliative centres with a multi-disciplinary team that can provide home-based care.

- **Output process** is a person's response to pain or pain control as the outcome of this model which entails controlled pain through adaptation.

However, nursing activities for cancer patients involve manipulating the stimuli that come from the environment to support the client to cope positively resulting in adaptation. Adaptation to pain is considered as the effective response to adverse a stimulus produced externally or internally. Achieving effective adaptation would mean appraising physiological and three psychosocial modes. The psychosocial model of adaptation include self-concept; role function and interdependence mode, four modes of adaptation are an interrelated relationship**.**

Roy Adaptation Model will guide this study as a conceptual framework in order to :

1. To investigate the relationship between environmental stimuli (focal, contextual, and Residual stimuli) and four adaptive modes of RAM which causes cancer-related pain
2. To note the effect of environmental stimuli on the coping mechanism
3. To correlate research variable with theory concept, and to assist the researcher to predict the results and recommendations by answering the research question.

1.14 Conceptual framework

A conceptual framework is a diagrammatical representation of the hypothesised relationship between independent and dependent variables of the study (Mugenda and Mugenda, 2003*).* A quantitative researcher defines the research problem and main variables that are assumed to resolve the problem, however in qualitative research inductive position is applied, and the researcher pursues to build up theory (Chetty, 2015). Thus existing theories can be misleading, and the conceptual framework develops after the research is complete. However, in this study both qualitative and quantitative notion is appraised in order to conceptualise a nursing care model for pain management with related variables. Such variables include the independent variables, dependent and intervening or intermediate variables. Independent variable is changed or controlled to test the dependent variable effect. Thus, the independent study variables included: patient's perception to pain, psychosocial support, spiritual support, pain relief medications and strategies which can be manipulated by the researcher to assess the dependent variable which is pain relief or control. There is also intervening, intermediate, or indirect variables (Andrew, 2009) which have effects on the dependent variables

1.14.1 Study Variables

Dependent Variables

1. Cancer Pain management (control of pain)

Independent Variables

1. Use of WHO -3 step ladder medication of pain relief.
2. Traditional pain treatment (heating/burning, herbs, Quran reading, surgery)
3. Patient's perception.
4. Psychosocial and spiritual support.

Intervening variables

1. Distance in the healthcare facilities.
2. Nomadic lifestyle.
3. Accessible & acceptable of care model of pain.

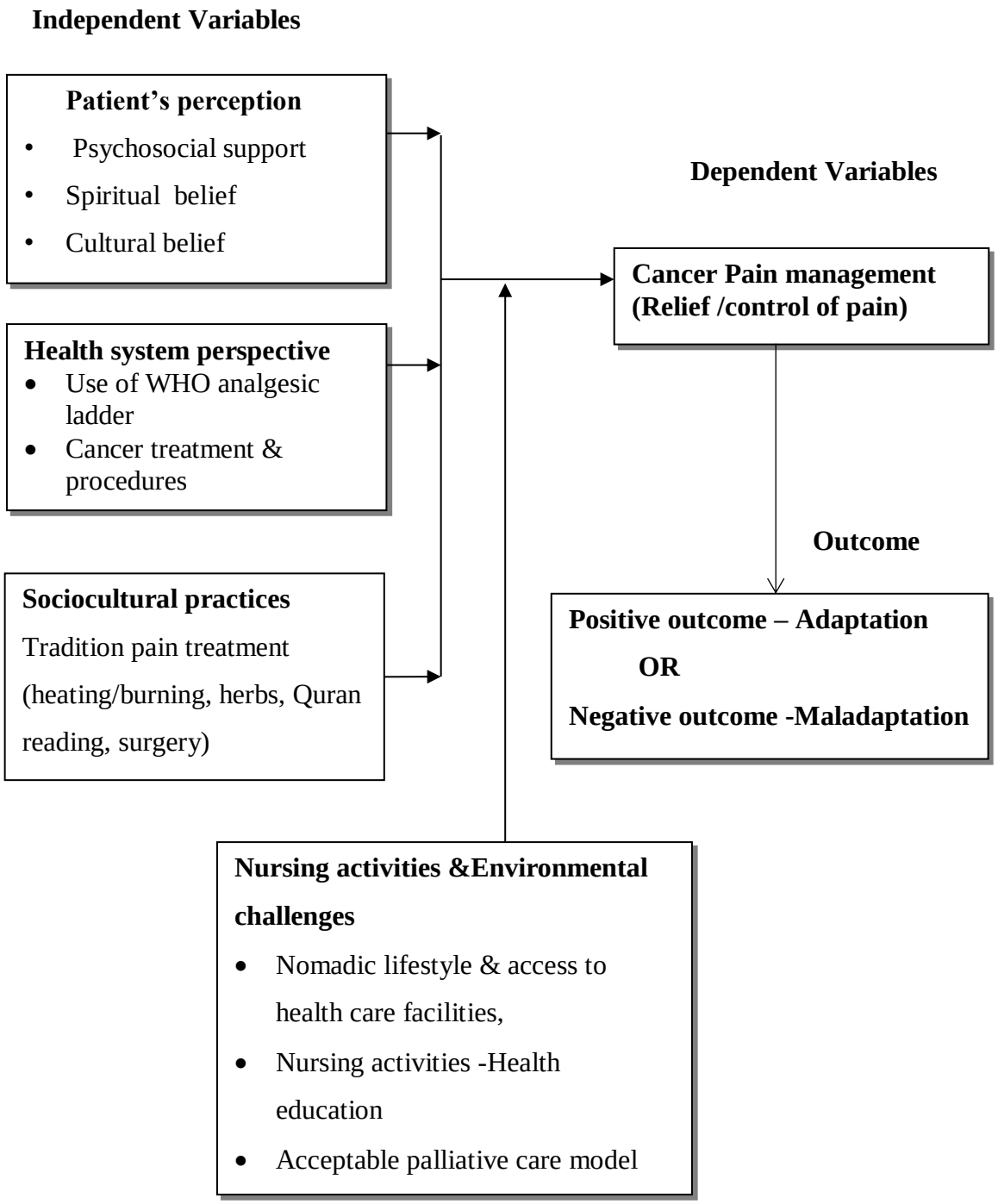


Figure 1.2: Conceptual Framework

(Adapted from the literature review)

1.15: Operational Definitions Used In This Study

Acute pain: pain due to apparent injury or illness. Illnesses that have a short duration

Adult patient: person aged above 18 years and is receiving care in a health facility

A-delta fibres (Aδ): Myelinated sensory fibre that responds to stimuli like cold or pressure. It is also nociceptors, and when stimulated it is interpreted as first, quick and shallow pain information.

Allodynia: a stimulus that is causing the pain, it does not usually irritate pain

Analgesia: When pain is absent, that is responding to stimuli, which are painful

Bradykinin: it is an active polypeptide from blood plasma globulin, and it mediates inflammatory responses. It is a potent vasodilator and increases capillary permeability, constricts smooth muscles and stimulates pain.

Breakthrough pain: transitory pain that causes a problem which otherwise can be stable and controllable. There are transient increases of pain to moderate intensity on the baseline in a patient on analgesic treatment for pain

Bidis Smoking: is made from tobacco inform of small hand-rolled and they are wrapped in a temburni leaf.

Cancer: is made up of human abnormally uncontrolled growth cells, which can migrate from the original site. They can spread to distant. Cancer can also be defined as the disease of the gene. It causes an alteration of the gene cell resulting in abnormal growth of the human cell.

C fibres: unmyelinated sensory nerves of the somatic system, responds to stimuli with strong intensities and accounts for the slow, more in-depth information. It spread over the unspecific area and gives information of other pain.

Clinical Nurses: nurse giving direct patient care in the hospital setting

Chronic Disease: conditions or illnesses that have prolonged duration, cannot be determined spontaneously, and are rarely entirely cured example is cancer disease.

Complementary medicine or alternative medicine: means great traditional practices for healthcare which is not that are not from a country 's tradition or unoriginal medicine. Such medicines are not thoroughly combined into the important health-care system.

Exorcism: a process that is used for relieving pain by getting rid of an evil spirit, such as prayers and ceremony

Epidemiology: this is the study of the distribution and causes of health-related events such as pain, disease and the procedures linked to diseases control and other health problems

Globocan: an international project that updates annually the cancer estimates and statistics from the previous year in the areas of incidence, mortality and prevalence

Herbal treatment: this is the use of chemical materials found inside roots, leaves, seeds and flowers of herbs

Hyperalgesia: when there is increased sensitivity to pain stimulus

Histamine: a chemical neurotransmitter found in the mast cells, white blood cells (basophils and eosinophils) and is produced during an allergic reaction or comes as a result of the inflammatory response.

Incident pain: pain occurs after a specific circumstance, perhaps after a particular movement or change of position

Modulation: is the process of strengthening pain-associated neural indicators. It usually happens in the dorsal horn that is in the spinal cord, though somewhere else because of the input from ascending and descending pathways.

Malignant tumours: Are cancerous cells that grow out of control and can attack close by tissues, spreading to the rest of the body

Metastasis: is the process when cancer cell spreads to the rest of the body other than the area it first attacked

Neuropathic: pain that is usually partial opioid-sensitive, it is transmitted by the damaged nervous system

Neuropathy: disorder in function or pathological change of the nerve

Nociceptors: are receptors on an organ that has preference sensitive to a noxious stimulus or pain receptors in other words. They aid in the transmission of information.

Nociceptive pain: pain is usually opioid-sensitive, and it is transmitted by nerve, which is not damaged

Nocicepathic pain: pain that is transmitted by a damaged or injured nervous system and it is partially opioid-sensitive

Nonopioid analgesics: on the other hand, acts to reduce the generation of pain mediators at the site of tissue damage or injury (Craig and Stitzel).

Nociception: is the process that involves the free nerve endings in the skin to respond, it is an intense, potentially damaging stimuli or the production of pain due to tissue-

damaging stimuli in the nervous system. Example of nociception pain is like the superficial pain started by activation of nociceptors in the skin.

Nurse Manager: the nurse in charge of the hospital / the administrative nurse

Model of care: is explained as a diagrammatic representation of care that is systematically constructed in order to enable practitioners in organising their thinking about what they do by transferring their thinking into practice.

Opioid analgesics: drugs that block the transmission arrival of nociceptive indicators to the brain and additionally have action on the intricate brain centres to control pain adequately

Pain: a Latin word which was derived from the word poena, meaning punishment. Pain is also defined as the perception of nociception and determined by interactions between sensor neural activity and other factors.

Pain Management Index: Cleeland 1994 introduced a guide that compares the most effective analgesic medication prescribed for cancer patient against the reported level of worst pain by patients. The prescription is done utilising Numerical Rate Scale found in Brief Pain Inventory tool.

Palliative care: A method of care that enhances the quality of life in an ill patient and their families who are facing the problems related on life-threatening ailment through early identification and impeccable assessment and pain treatment and other problems.

Patient: the person receiving care in the Hospital

Pathophysiology: It is an explanation of a mechanism of how the condition has developed or disease process. It explains the progress of the disease; functional alteration

associated with a disease or injury; and functional alteration as a result of a disease or injury.

Pharmacological approach: is the conceptual framework of pharmacological treatment of a disease and it is the administration of a drug to manipulate the outcome of a disease process or a condition

Prostaglandins: a chemical found in most tissues and organs and has properties to sensitise spinal neurons to pain, causing constriction or dilation in vascular smooth muscle cells

Perception: means the subjective experience of pain because of transduction, modulation, transmission and individual psychological characteristic.

Procedural pain: this is when pain is experienced by individual because of interventions.

Oral polypharmacy: administration or use of excessive oral drugs

Transitional model of care: Refers to actions considered to provide harmonisation and stability of health care when patients are transferred from one location to another. For instance, when there is a transfer from the hospital setting to home care. Transitional care model consists of an arrangement of logistics, educating patient and family members and ensuring health providers involved in the care.

Transduction: is a process that starts when there is the presence of a free nerve ending

Trephination: This is the process of performing a surgical operation on a patient with pain. In this procedure, the circular section of the skull is sliced away to create a hole in the skull, and such procedure was then practised during the Stone Age.

Traditional medicine (TM): indigenous medicine of different cultures. Its skill and knowledge-based practices with theories, experiences and beliefs with no justification or a time justifiable. Such practice may be used in the prevention, diagnosis and preservation of health. It may also be used in the improvement of physical treatments and mental disorders

Traditional and Complementary medicine (T&CM): This is merged terminology of Traditional Treatment and Complimentary Medication, including products, practices and practitioner

Serotonin: is a chemical that functions as a neurotransmitter. It is believed to be responsible for maintaining mood balance. The deficit or lack of serotonin leads to depression.

Somatic pain: This pain originates from the skin or deep tissues

Substance P: is a chemical that is significant in pain perception, it is associated with inflammation process and transmission of pain into the primary system known as central nervous.

Suffering: it is a threating situation of a status of a person or patient

Viscera or visceral pain: pain originating from the internal organs like Heart, stomach, kidney

Xannun: Somali word meaning pain

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

A systematic Literature search was done using MEDLINE interfaces (PubMed), HINARI, Oxford University press, CINAHL, Grey literature and Google scholar. Global

policy and studies on cancer pain management and cancer disease in resources limited countries were searched.

This chapter aims to explore cancer disease and cancer pain management. While cancer pain management is the main focus of this thesis, however, it is equally important to gain some understanding of the bigger picture of cancer disease. The keyword for the search includes *cancer, cancer pain,* and *model of cancer pain management.* The literature review is then organised in two parts. One part of this literature explores on cancer disease, its facilitating factors and treatment approaches and the other part searches on cancer pain management.

2.2 Cancer Disease.

2.2.1 Background on Cancer Disease

Hejmad (2010) defines cancer as a group of disease with abnormal cells growth that is uncontrollable, which disregard the standard rules of cell division. Mandal (2017) also explains that cancer disease causes genetic changes at many levels. Some affected genes by these alterations are cancer-causing genes known as oncogenes and genes that suppress tumours. The oncogenes can be a normal cell that is expressed incorrectly high levels in cancer patients, or it can be transformed into normal genes during cell mutation. Either case of these genes can cause cancerous in the body tissues. The genes that suppress a tumour impede division of cell and inhibit cells survivals with damage DNA. Patients with cancer frequently have damaged DNA caused by genes that promote cancer genetic alterations.

2.2.2 Global Epidemiology of Cancer

Cancer is a non-communicable chronic disease that of a global public health concern, and it causes a leading statistic of morbidity and mortality. WHO (2014) on population-based

data registry of 2012 estimates that over 8.2 million people of cancer patients worldwide in the year 2012 and predicted the increase of the new cases next two decades at an estimate of 70%. Cancer disease is noted globally as the second leading cause of death and was accountable for 8.8 million deaths in the year 2015. Globally, 1 in every six deaths is estimated to be caused by cancer disease. IARC (2017) report also predicted that by 2030, 27 million new cases of cancer patients would be diagnosed, with death cases of 17 million per year globally. The incidence of cancer disease will increase in developing countries with the weak economy where rates of survival are lower than half of the developed countries. More than 50% of the population affected will also be under the age of 65 years.

WHO (2014) reports that the five most frequent cancer diagnosis in women are colon/colorectal, breast, cervix, stomach and lung, while cancers commonly found in men are prostate, liver, colon/colorectal, stomach, and lung. According to Lindsey et al., (2015) article on Global cancer statistics states, two forms of cancers are the leading cause of death in less developed countries, that include lung cancer in men and breast cancer female respectively.

On the other hand, prostate cancers in men and lung cancers in women are commonly found in more developed countries. Other types of cancers such as stomach, colorectal and liver in men and uteri, cervix, stomach and colorectal cancers in women are commonly diagnosed worldwide. Cancer of the Bladder in men and uterine cancer in women are also found more common in developed countries, while stomach cancer and liver cancers in men and women respectively are reported as third and second most common cancers in less developed countries, causing a significant numbers death. Subsequently, Kenya Cancer Statistics & National Strategies upholds that an estimate of

30% of all cancers are treatable if detected early enough and about 30% are curable with long survivorship rate when identified early. Over 30% of patients with cancer can be provided with sufficient management of symptoms such pain management and palliative services.

2.2.3 Epidemiology of cancer in Kenya

Cancer is the third top cause of death after infectious diseases and related cardiovascular conditions in Kenya (KNCCS report, 2011-2016). The report highlights that cancer incidence in Kenya is close to 28,000 with a mortality rate of 22,000 cases through no population-based date exists. Over 60% of cancer cases in Kenya are below 70 years, and the risk of dying cancer is 12 %.

Over 80% cancer patients in Kenya present with advanced disease at the diagnosis stage when cure is limited, and the leading cause of cancer deaths in men is oesophageal and cervical cancer in women (KEHPC report, 2014). Korir et al., (2015) in their study on cancer incidence in Nairobi, Kenya revealed that, between 2004-2008, an overall estimate of 8,982 patients were registered. Korir et al., (2015) upholds that the most prevalent cancers are prostate cancer and breast cancer in men and women respectively. The second most common cancer in women is cervical cancer that followed by breast cancer, and oesophagus cancer was common in both genders though much higher among male gender than female gender at a ratio of 1 to 3.

MOH 718 (2013) register records of GCRH reports inpatient cancer cases of at least average of 10patients in average in a month Hassan et al., (2014) study on incidence of cancer using review of available histopathological data from January 2008 to August 2012 at GCRH revealed the increasing trends of cancer, the sparse data publication and analysis in this area. Hassan et al., (2014) study demonstrated the trend of cancer cases

as 35 cases in 2008, 40 cases in 2009, 39 cases in 2010, 45 cases in 2011, and 58 cases in 2012. This study further concluded the need to carry out community-based research rather than hospital-based research to get accurate data for cancer incidences in Garissa because of the nomadic pastoralism style of the inhabitants.

2.2.4 Predisposing Factors to Cancer disease

National Cancer Institute (2017) reports that growth and an ageing population are the principal cause the escalating cases of cancer in middle and low-income countries. National Cancer Control Strategy, Kenya report (2017-2022) supports that 5% to 10% of the entire cancer cases are attributed to genetic faults, and 90% to 95% are associated with environmental factors. On another continuum, this report further argues that cancer can occur at any age. For example, more than one-fourth of bone cancers cases are most frequently diagnosed in people under 20years and children and adolescents of 20 years and below who are diagnosed with leukaemia account for about 10%. Certain types of cancer, such as neuroblastoma, are commonly diagnosed in adolescents or children than in adults. According to Jemal et al., (2011) study from GLOBOCAN statistic review on incidence and mortality rate registers of various countries both developed and developing countries upholds the increase in cancer cases as due to dietary risks or behavioural problems.

Jemal et al., (2011) found that the data from developing countries on the epidemiology of cancer may not give the accurate picture of the country's cancer situation because most of the studies reflect on the urban population. Thus, cancer registries can be invaluable in determining the magnitude of cancer disease burden in developing countries. Jemal et al., (2011) outlined significant risk factors to increasing cases of cancer as infections, poor nutritional practice (low vegetable and fruit intake), and behavioural factors that are

risky such as high body mass index, lack of physical activity, alcohol consumption and tobacco ingestion. National Cancer Control Strategy (2022) Kenya document estimates that 25% to 30% of all cancers associated deaths are due to tobacco ingestion, 15% to 20% are related to infections, 30% to 35% are linked to diet, and the residue percentage is associated with other factors like environmental pollutants, radiation, stress and physical inactivity. WHO (2018) states that most cancer patients visit in health facilities in late-stage of diseases process and severe pain. More so some of these health facilities may be ill-equipped for diagnosis and treatment of cancer patients. For instance, in 2017 WHO reports, that only 26% of low-income countries have pathology services and these are only available in the public sector. While more than 90% of countries with high-income describe the availability of cancer treatment services, it is only available below 30% of countries with low- income.

NCI (2014) document on causes of cancer, outline that tobacco smoking is associated with various types of cancers and is seen in the higher incidence of cancers such as larynx, oesophagus, pancreas, lung, mouth, throat, kidney, liver, stomach, bladder, colorectal, cervix and acute myeloid leukaemia. Mainly, Bidi smoking is linked with oropharynx cancers and cancer of the larynx. According WHO (2018) document on causes of cancer globally estimates about 91% cancer of the oral and coronary heart diseases are attributed directly to the usage of tobacco. Cigarette smokers have nearly 70% greater mortality than non-smokers do. Cigarette smoking has been linked to a significant upsurge of breast cancer, principally among those who started at adolescent or peri-menarcheal ages, and the risk is relatively higher in women with a family history of cancer. According to WHO (2018) on cancer facts, tobacco is the main risk factor of cancer disease that is accountable for about 22% of death. Thus, the need to reduce tobacco consumption can be addressed

using a primary prevention approach, to overcome the increasing numbers of global deaths.

Murthy & Mathew (2004) postulate that worldwide findings from numerous case-control and cohort studies demonstrate the extreme alcohol consumption as a main liable factor for the high incidence of liver cancer, high risk of cancers of rectum, breast and colon. Vineis and Wild (2014) uphold that human papillomavirus (HPV) and hepatitis infections account for up to 25% of cases of cancer in middle-income and low –income countries. Studies found that human papillomavirus (HPV) is responsible for most of the cervical neoplasia that is a sexually transmitted infection. Evidence also shows that sexually transmitted virus relates to a variety of other malignancies like cancers of the penis, anal, oral and oesophageal carcinoma. Vineis and Wild (2014) suggest that one of the significant advances in cancer prevention for the past decade was the breakthrough development and application of HPV vaccination to prevent cancer of the cervix.

Murthy and Mathew (2004) study suggest that physical inactivity, diet deficiency and obesity are some of the lifestyles that are associated with cancer. For instance, Murthy and Mathew (2004) explain that the risk factor for breast cancer is obesity (found after menopause). Obesity is also associated with the risk factors for cancers of the endometrium, kidney, colorectal, pancreatic and oesophageal cancers. Murthy and Mathew (2004) further argued that red and processed meats consumption and fibre low diet had been linked to colorectal cancer. Physical inactivity is also reported as the main risk factor for cancer of the endometrial colon and breast both directly and indirectly through its effect on body-mass index (BMI). Mounting scientific evidence offer valued information that positively proposes the role of diet in cancers disease. For instance, high fruits and vegetable consumption is linked with lowered risk of several cancers that

include the oesophagus, bladder, lung, oral, pancreas, larynx, cervical and stomach cancers.

According to Vineis and Wild (2014), environmental carcinogens such as contact with diesel exhaust IARC Working Group categorises emissions as human carcinogens (group 1). Pesticides exposures, several solvents and disinfection by-products are also believed to cause a significant risk of lung cancers.

In addition, IARC (2017) states that countries with low income continue struggling with a substantial burden of communicable diseases as well as increasing burden of non-communicable diseases like cancer disease. There is a high number of patients' death rate from cancer disease in developing countries, however an effort to control this has demonstrated less effective due to inequalities of resources between the highest income and lowest income countries. Thus, poor populations especially are trapped in by vicious cycle as shown in figure 2.1.

IARC (2017) document explains the vicious cycle as poverty among the African population, low level of education, limited knowledge about cancer, limited of evidence leading to less efficient action, poor access to health care, lack of prevention programs, which leads to late detection of the disease and poor treatment outcome. Generally, there are limited government funds for health care expenditure for cancer care, and a general paucity of trained health care professionals in cancer management.

Figure 2.1: Vicious cycle in cancer: challenges facing in developing countries

2.2.5 Cancer Prevention Strategies

Cancer preventions are a range of activities divided into primary, secondary and tertiary preventions. Mirghani and Fakhry (2017) study explain primary preventions are a set of interventions that focus on avoiding the development of the destructive process. IARC (2017) also document that the primary prevention of cancer aims to reduce exposure to an individual's risk factors or increase their resistance towards cancer disease thus avoiding the prevalence of cancer cases. Such intervention includes health counselling and education on cancer, environmental controls of risk factors and immunisation against infectious diseases, enforcement, and legislation to ban the cancer risk factors. That is control of all exposures of all predisposing factors to cancer disease to Secondary individual prevention, on the other hand, are set of interventions that result in the discovery and control of cancerous processes such as screening, early detection, and effective treatment of all cancers. Tertiary preventions are softening the impact of an on-going cancer illness. This strategy of prevention aims to control negative consequences,

minimising Metastasizing and recurrent disease, thus reducing disability. Palliative care and pain management to cancer patients is tertiary prevention, though palliative activities should even start at earlier levels but continues even during the tertiary level. Considering cancer patients to light duties instead of losing their jobs, teach them how to manage their pain, control disability and other symptoms.

WHO (2015) document outline the significance of prevention strategy for cancer globally. This document states that despite the limited resource of a county, National Cancer Control Programme (NCCP) is a vital public health approach. This because, NCCP intends to decrease the number of cancer cases, lower deaths rate and enhance the quality of life of cancer patients. NCCP focuses on an evidence-based approach to implement systematic and justifiable cancer prevention, early identification of disease, management and palliative services utilising the existing resources.

WHO (2014) explicate that a third of all cases of cancer is preventable by applying cost-effective cancer control programs and early screening. In addition, Namukwaya et al., (2010) studies on cancer in resource-limited countries using literature review reveals that over 70% of cancer deaths occur in middle and low-income countries. The cancer deaths are due to lack of adequate resources, the paucity of literature on cancer symptoms, knowledge of early cancer screening and treatment. Furthermore, WHO (2014) guidelines recommend the significance of managing patients diagnosed with various types of cancer at palliative care units or hospice for the better intervention of their symptoms including cancer pain relief.

According to NCCS (2022) cancer remains a considerable burden in the health sector and this is compounded by limited capacity in health facilities of low-income countries such as Kenya.

These countries face challenges in providing essential health care for cancer patients. Cancer patients frequently experience the late-stage patient presentations, late diagnosis and inaccessible treatment in the health facilities across Kenya. The lateness is associated with lack of awareness and knowledge by the community, lack of cancer diagnostic equipment and trained professionals in most part the country. It is also reported that merely 35% of countries with low income have pathology services in the public sector in the year 2015.

In addition, cancer has an economic impact that is significant and increasing. Cancer's toll on population health is inseparably associated with the economic impact, although NCCP supports to decrease cancer burden and progress services for patients with cancer and their families.

The economic impact of Cancer includes increased medication cost, expensive diagnostic test, treatment cost, and loss of income or work by cancer patients, increased financial requirements, the physical and emotional load on the families and caregivers. Cancer cases are also on the increase, NCCS (2022) document estimates new cancer cases of about 37,000 and cancer deaths of 28,500 in Kenya in the year 2012. The widespread deaths call for prioritised intervention in the preventions and control of cancer. Interventions based on a strategy that considered in setting forward specific and achievable objectives. Such a strategy should also be based on the current cancer burden, risk factor occurrence and available resources. Therefore NCCS (2022) has planned five priority aspects for the prevention and control of cancer in Kenya that include the following;

- Prevention, early detection and screening of cancers.
- Proper diagnosis, registration and surveillance of cancers.

- Provision of treatment, palliative care and survivorship.
- Coordination, partnership and financing cancer programs.
- Monitoring, evaluation and Research of cancer.

NCCS (2022) further explains that prevention of cancer is a most economical long-term plan for the control of cancer disease. This document highlights various studies indicating that from 30% to 50% of cancer deaths are preventable by avoiding the critical risk factors, such as tobacco consumption and tobacco products, keeping appropriate body weight with regular physical exercise, decreasing alcohol consumption and controlling infections associated with cancer disease. Thus, integrating long-term cancer prevention with other no communicable diseases such as coronary heart diseases and diabetes is reported as cost-effective.

2.2.5.1 Primary Prevention strategy of Cancer

Primary prevention aims to avert the onset of cancer, by either decreasing, the exposure to the predisposing factors to cancer or improve individual resistance to cancer disease. Murthy and Mathew (2004) argued that primary prevention is mainly workable on tobacco-associated cancers such as cancer of the lung, oral and pharyngeal. Such primary prevention includes educating the public on the effect of tobacco ingestion on their health, implementation of tobacco control and advocacy for tobacco control policies. WHO (1999) handbook on chapter four on reducing the risks and prevention of diseases, tobacco is mentioned as the most commonly available harmful product on the market that causes cancer disease. WHO (2015) outlines that an estimate of 80% of 1 billion smokers worldwide lives in countries with middle and low–income resources. Cancer-associated with tobacco has high mortality and is responsible for nearly 6 million deaths each year. WHO sponsored negotiations Framework Convention on Tobacco Control (WHO,

FCTC) to reduce the harm caused by tobacco and it is a treaty that is universally legal binding. This treaty is described as a structure for protocols and guidelines to minimise tobacco supply and tobacco ingestion that is based on validated interventions. Guidelines of (WHO, FCTC) contain measures on taxes and prices, contact to tobacco smoke, a product of tobacco and adoption of suitable labels with a health warning on bidi packs and cigarettes packets. The measure also includes monitoring of advertisements on tobacco that encourages the sale of tobacco products, prohibition for smoking in public places, warning on the smokeless product of tobacco, the prohibition on the sale of tobacco products to a minor. Subjecting high tax on bidis similar to that on cigarettes is essential in controlling tobacco-linked cancers.

WHO (1999) states that primary prevention also includes nutritional education regarding prevention of cancer regarding taking a diet low in fat, high fibre intake, vegetables and fruits to control cancer of various forms. According to WHO (2015) document, obesity and overweight are associated with several cancers such as breast cancer, colorectal, endometrium, kidney and oesophagus cancers**.** Dietary guidelines such as avoiding the intake salt, preserved and canned food, overcooked food substances, damaged mouldy foods and smoking.

Primary intervention programs of educating the community to promote physical activities to avoid obesity and accumulation of fat that will enhance cancer cell growth are vital. Intervention program will promote the maintenance of appropriately balanced diet rich in fibre, fruits and vegetables, weight for height that will avoid both malnutrition and over-nutrition. Evidence demonstrates that physical activity of 30 minutes to an hour per day will considerably decrease the risk of cancer of colon and breast.

Kruk and Czerniak (2013) did a literature review study on the relationship between physical activities and risks of cancer found that over 300 epidemiologic studies that associate physical inactivity to cancer globally. Cancer of the colon is most extensively studied that have been associated with physical inactivity. Colditz and Lee (2009) meta-analysis study of 52 epidemiologic research associated physical inactivity and risk colon cancer. Wolin et al., (2009) study confirms prior studies that reported the association between colon cancer and physical inactivity of both male and female gender, thus providing measurable estimates of the reverse association. Wolin et al., (2009) study further revealed that individuals who are physically very active had 24% lesser risk of colon cancer than the physically inactive individuals.

Weiderpass et al., (2016) study on a leisure-time physical activity about cancer risks, found that leisure physical activities lower risks of many forms of cancer and generally improves individual health. Thus, health care professionals are expected to advise and counsel inactive adults on the importance of weight reduction. This study explains that a collective enquiry of information on leisure-time physical activity from 12 prospective U.S. studies and European cohort studies have all agreed that 16% of the reduced risk of many forms of cancer in physically active individuals as compared to those who are least active.

Decreased risks of cancers are linked to a physical activity that includes breast cancer in premenopausal and postmenopausal women, colon adenomas, and a polyp in colon cancer. It was reported that physical activity women after menopause had lowered risk of cancer of the breast than women who are physically inactive. Keimling et al., (2015) did a study on meta-analysis and systematic review of the risk of endometrial cancer and physical activity. This study was carried out in October 2014 and identified 33 relevant

published studies. Keimling et al., (2015) study revealed that cancer of the endometrial has risk reduction of 20% in physically active individuals as compared to inactive Individuals. Through the risk of endometrial cancer and obesity is associated with the physically inactive person.

Plummer and Franceschi (2012) study on sexual intercourse and risk of cervical cancers linked early age of marriage as a predisposing factor to cancers. Infections are due sexual intercourse in early ages is associated with high risk of cervical cancers. According to WHO (2015) human papillomavirus (HPV), hepatitis B and C, Helicobacter pylori, and Epstein-Barr virus cause an estimate of about 15% in all cancers. Cancers caused by infections varied between countries and development status. It is reported that less than 5% of cancers caused by infection are found in New Zealand, Australia, the United States, Canada, Northern Europe and western countries while more than 50% of cancers caused by infections are found in some countries in sub-Saharan Africa. Strategies for raising the age at marriage above 18 years are seen as reducing the risk of infections.

Adopting safe sexual practices, attention to personal hygiene, use of obstructive methods of contraception, observing small family size, could also help towards primary prevention of invasive cervical cancer. Intrauterine Cancer Control that is most linked with multiple sexual partners and early onset of sexual activity. Vaccination practices have resulted in positive improvements in cancers management. For instance, prophylactic vaccination for human papillomavirus (HPV) is the most realistic and useful alternative for the prevention of cancerous lesions and pre-cancerous of the cervix**.** The use of vaccinations against hepatitis B virus in the infants' programs would help to prevent cancer of the liver. Thus, availability of vaccination for some HPV and hepatitis B virus vaccine can reduce the risk of cervical cancers and cancer the liver, respectively.

Murthy and Mathew (2014) upholds that Primary prevention of human breast cancer can be attained by adopting practices such prevention of cigarette smoking, avoidance of breast radiation exposure in young women particularly in adolescence, full-term pregnancy and delay in onset of menarche. Prevention of malnutrition and increasing physical activity in adolescence is also noted as primary prevention of cancers. Prophylactic mastectomy in women with a history of breast cancer, relative prolonging in the duration of lactation and avoiding obesity in postmenopausal women are some critical practice of breast cancer primary prevention.

2.2.5.2 Secondary Prevention strategy of cancer

National Cancer Institute (2010) document outlines the components of secondary prevention of cancer include proper screening for cancer, early detection and treatment. The use of chemotherapy to slow the growth of a cancer cell to kill is the second approach to cancer prevention. For example, anti-cancer (cytotoxic) drugs help cure the early stage of cancers or reduce the progression of cancer cells. Cervical cancer or medical of cervical carcinoma develops when cells at the opening of the cervix become abnormal or change. Through screening, the abnormal tissue can be identified and then removed before it has a chance to perhaps advance into cancer.

According to Tota, El Khatib and Franco (2014) study explained the roadmap ahead of cervical prevention. A prevention strategy is a screening approach that includes visual inspection with acetic acid (VIA) on the cervix, visual inspection with logo's iodine (VIAL). Eye visual inspection of the cervix (downstaging), magnified VIA (VIAM), cervicography, cytological examination and HPV DNA testing in detecting cervical cancer and its precursors. Tota, El Khatib and Franco (2014) suggest that cervical cancer is mostly linked to stubborn infection with risk of Human oncogenic papillomavirus (HR-

HPV). However, the current discovering of human papillomavirus vaccination has the ultimate potential for the reduction of the global burden of cervical cancer and precancerous lesions. According to IARC (2017) report, Kenya has estimates of about 4802 women diagnosed with cervical and about 2451 death every year. Cervical cancer is ranked as number one most commonly detected cancer in Kenyan women of age between 15 years to 44 years and an estimate of 63.1% with invasive cervical cancers that is recognised as HPVs 16 or 18.

Murthy and Mathew (2014) suggest that secondary prevention also involves oral and Breast cancer screening. In oral cancers, visual inspection is found to be a suitable test for screening oral cancers and simple pricking of the breast by fine needle aspiration and sending the aspirate for cytology for detection of cancer cells. Mammography can be performed for the first discovery of breast cancer, but it is also a suitable approach of cancer control. Hormone therapy in cancer can also be used in response to chemical messengers (hormones) in the body that can be controlled by use of drugs that stop the body's production of that hormone as well as shrinking tumours that are causing discomfort. For example, hormones that used to lessens swelling around a tumour in the brain is corticosteroids.

According to the National Cancer Institute (2010 radiotherapy is a treatment that reduces the progression of a cancer cell, as well as cancer pain. Radiotherapy is the use of gamma rays (radiation) to destroy or kill cancer cells. This high energy will shrink a tumour that is causing discomfort and reduce the pressure. This type of treatment can categorise as both secondary treatment and tertiary level of care. In addition, the National Cancer Institute (2010) explains the significance of surgery or removal of a tumour causing cancer, and perhaps with a combination of radiotherapy. Some cancer patients can

undergo an operation where part of a tumour or the whole tumours is removed. The operation can relieve pain and release pressure caused by tumours on the nerves or organ.

2.2.5.3 Tertiary prevention

Jacobsen and Andrykowski (2015) study approach of literature review explains the concept of tertiary prevention of cancer. Jacobsen and Andrykowski (2015) suggest that tertiary prevention aims to increase the prognosis and enhance the quality of life in cancer patients, this is through offering best available therapy and rehabilitation program. Tertiary preventions include not only the progression of treatment but also rehabilitation and control of cancer pain in order to restore the individuals affected by cancers to perform useful and satisfying roles in the society. Thus, tertiary prevention aims to reduce morbidity and disability in cancer patients by providing psychosocial support, curing early cancer and advance in cancer care and rehabilitation, which is termed as tertiary prevention. Palliative care services may be categorised as tertiary prevention since it focuses on controlling symptoms such as pain management and prevent complication associated with long-term life-threatening conditions such as chronic non-communicable diseases.

2.2.5.4 Palliative care services

According to WHO (2015), Palliative care is defined as a method aimed to improve the quality of life of patients, their significant others and their families with challenges of serious illness. Palliative care is done through preventing and relieving distress by utilising appropriate assessment, primary diagnosis and treatment of pain and other symptoms. Palliative care includes supportive care, comfort care, advanced care, hospice care, pain and palliative care. All these cares are intended to provide psychosocial, spiritual and physical care to patients with a chronic, life-threatening illness such as

cancer. According to WHO (2015) an estimate of 40 million people need palliative care globally each year. However, only 14% of them receive palliative care and about 78% of these people live in countries of middle and low-income resource such as Kenya. Reason for this challenge is linked to the restriction on regulations for morphine, which deny access to adequate pain control and management, limited training and lack of awareness on the concept of palliative care among health care experts and community at large. However, in blueprint KNCCS report (2011-2016) emphasised the importance of palliative care interventions with pain relief component as the focus of cancer management in Kenya. KNPCG (2013) on the other hand document the need to develop and strengthen palliative care centres across Kenya, support home-based care for all cancer patients and advocate policies that will support palliative centres. KNPCG, (2013) reports on pain control at all phases of the cancer disease process. This report further states the significance of setting up Programs for training both health workers and the community highlighting on cancer pain control. Thus, this called for a study that would provide baseline information on cancer situation and prevalence of cancer pain in such a marginalised area of Kenya for better policy implementation for cancer pain management.

WHO (2007) highlights that palliative care services are a multidisciplinary approach with a team of healthcare providers that includes physicians, psychologists, social workers, spiritual counsellors, volunteers, nurses, pharmacists and traditional healers. The need for palliative care for all cancer patients irrespective of the stage of the cancer disease is significant. According to WHO (2007), healthcare providers play a significant role in the provision of physical, spiritual and psychological support, to offer:

- Pain relief and control of other stressful symptoms.

- Sustains life, respects death as a normal process and plans not to postpone or hasten death.
- Systems that can support patients live as active as they can cope until death inevitable.
- Enhance system to assist the family members of patients in coping with the illness and during bereavement.
- The multidisciplinary team approach of services that addresses the requirements of patients, their significant others and family members including bereavement counselling.
- Enhanced life of quality that can positively influence the progress of the illness.
- If necessary in the early progress of the illness, a combination of therapies can likely lengthen life. For example, the use of radiation therapy, chemotherapy, or both, carrying out investigations needed to realise better and handle stressful clinical complications.

Moreover, WHO (2015) outlines that as the burden of cancer increases with ageing population and other non-communicable globally, so as the requirement for palliative services that will remain to intensify. Early palliative care initiation for non-communicable diseases such as coronary heart disease, diabetics, cancer and kidney disease will be necessary in order to reduce unnecessary hospital admissions.

According to Von Gunten (2002) uphold that secondary treatment and tertiary care services in US hospitals has categorised as palliative services. Palliative care comprises of interdisciplinary care for patients to offer comfort and life with quality of life to cancer patients. Palliative care may be viewed as primary level since they provide simple skills and required competencies by physicians, nurses and other healthcare professionals. For instance, the assessment of signs and symptoms of breast cancer can be categorised as the

primary level of care. Secondary palliative care means there are clinician specialists and organisations that provide consultation and specialised care. Tertiary palliative care also means that clinical specialists have a high level of knowledge for the most complex cases in practice and thus, these centres become academic medical centres and research centres.

2.2.5.5 Staging and Treatment of Cancer Disease

WHO (2015) reports explain the purpose of early diagnosis is to enable accurate disease identifications, proper staging and treatment of cancer, thus minimising cancer pain. Early diagnosis will significantly extend the life of patients and thus promote the best possible quality of life for survivors of cancer. WHO (2015) reports that an effective cancer treatment programmes will have to consider equitability and sustainability approach care, accurate diagnosis, early detections and staging of cancer disease and adheres to a current evidence-based standard of care to all cancer patients. The cancer treatment will benefit the cancer patients in either for an appropriate cure or by enhancing prolonged life, controlled pain and improved quality of life.

According to NIC (2017) diagnosis of cancer encompasses numerous systems and procedures utilised to identify or ratify the presence of cancer. Some procedures may induce pain to the patients. Diagnosis of cancer comprises of evaluation of the patient's history, evaluation of laboratory test results, clinical examinations, and radiological data. Microscopic examination of a specimen of tissue obtained by fine-needle aspiration or biopsy is also carried out. Physical examination is areas where the medical professional can palpate lumps perhaps can indicate the presence of a tumour. Physical examination is a procedure done to rule out irregularities, such as skin colour changes or extension of an organ or presence of tumours in body organs

Laboratory tests of body fluids such as stool, blood and urine tests will help recognise abnormalities that may cause cancer. For example, people with leukaemia their blood is taken for complete blood count and may be found with an unusual number of white blood cells. A biopsy is one procedure that involves the collections of cells specimen for analysing in the laboratory. Biopsy procedure will assist to identify the various type of cancer and enhance cancer diagnosis. The sample cell collected from the patient will be subjected to a microscopic examination where normal cells will look identical, with similar sizes and organisation. However, the cancer cells will be less organised, with varying sizes and without apparent association. Biochemical indicators of presence or absence of a tumour have also recently performed in the clinical practice of cancer screening. Molecule detection in body fluids and plasma in which tumour markers are measured. Tumour markers are biochemical that is linked to malignancy. Tumour markers are the product of tumour cells (derived from a tumour) or body to response tumour cell (a tumour -related). When the diagnosis is definite that is cancer is confirmed, then cancer staging and follow-up is done. When the primary diagnosis is negative for cancer disease and patients' symptoms continue, then more tests are required. Usually, a biopsy of body tissue confirms whether the patient is positive or negative for cancer.

Imaging tests are the non-invasive way that will allow visualising internal organs and bone. Imaging tests commonly used to diagnose cancer are ultrasound, X-ray, computerised tomography (CT) scan, magnetic resonance imaging (MRI), positron emission tomography (PET) scan and bone scan.

WHO (2017) Reports that early identification of disease and treatment improves patients' well-being. Thus, delayed cancer diagnosing and inability to provide appropriate treatment condemn many people to distress and early death. According to WHO (2017)

new guideline, all countries can adapt the following steps to improve on early diagnosis of cancer. These are:

- Develop public awareness programs on various symptoms of cancer and encourage people to seek care as they arise.
- Enhance training health workers, strengthen and equip facilities, so that accurate and timely diagnosis is conducted.
- Make sure people with cancer disease can access safe and real treatment such as pain relief, without spending excessive finance or experiencing financial hardship.

The seventh edition of (AJCC, 2010) manual outlines cancer staging and explains this approach as a vital step in allowing better patients' treatment. Staging will help to evaluate the spread of cancer from one organ or system of the body to another. Cancer staging provides physicians and healthcare workers to organise patients and allows patients' stratification. The stratification will lead to better decisions making for the treatment of cancer and the setting of a standard treatment for cancer management. The stratification will also enhance the formation of clinical trials testing for the future cancer treatment strategies.

There are numerous cancer staging systems globally, and their difference is based on the objectives and needs of users in clinical practice and surveillance of the population. However most commonly used staging system with clinical benefit is the use of the International Union for Cancer Control (UICC) staging systems and tumour node metastasis (TNM) system by AJCC.

The classification of TNM system cancers is based on size and the magnitude of a primary tumour, which is labelled as (T), the contribution of the lymph node is also considered as (N), and whether there is absence or presence of distant metastases is known as (M).

Staging of TNM has an algorithm for cancers of almost every anatomical site and histological identification. Evaluation of laboratory investigations such as complete blood count, chemistry panel, and urinalysis is essential during staging. The scope of the diagnostic examination for staging is dependent on the known behaviour of the individual tumour type combined with the patients' goals, limitations, and expectations for therapy. In recent years, however, TNM has complemented carefully by selected non-anatomic prognostic factors, which is clearly explained in edition eight of (AJCC). Non-anatomic factors regarding cancer staging and prognostic information provide vital information for management of cancer disease. The factors predict the benefit of specific treatments. There are known aspects that alter outcomes of patients or their response to treatment that include gender, duration of signs and symptoms, age, the clinical and pathologic anatomic degree of disease, health status the patients, the type and stage of cancer disease, and specific biological properties of cancer.

When collecting clinical evidence, clinical assessment is vital that involves history taking, physical examination of the patient, biopsy of the primary site, surgical exploration, or other relevant examinations such as imaging and endoscopy. For example, findings of surgical exploration and a biopsy of the primary site that is obtained without resection or when the pathologic material is not obtained are referred to as a clinical approach. However, if the biopsy offers pathologic material on the highest possible T grouping, in this case, it is categorised as (PT). Examinations of a single pathological node in the deficiency of pathological evaluation on primary tumour are known as clinical (CN). An example is if a biopsy of the sentinel node is done before therapy of neoadjuvant in breast cancer. Extensive imaging is not also required for clinical classifications and further information on mostly accepted standards for evaluations and diagnosis of individual cancer types.

Moreover, according to seventh edition AJCC (2010), there are general rules in the use of T, N, and M for all sites and thus classifications include:

- The need for Microscopic confirmation that includes clinical classification of the use of TNM. In most cases, if there is cytology of a tumour that can be staged but rare cases that do not have, analysis of survival should be done separately. Such unusual cases should not be incorporated in overall disease survival analyses.
- Eligibility of duration or period to determine to the stage: Information about the extent of cancer spread before initiating treatment is obtained for clinical staging. Systemic or radiation therapy, surgery, palliative care and active surveillance are done within four months after the date of diagnosis. As long as, cancer has not naturally progressed during that time frame.
- Pathological staging is information attained regarding the extent of cancer spread through complete final surgery as first-course treatment or predictable within four months after the date of diagnosis if there is no systemic or radiation therapy initiated or no natural progression of cancer during that time frame.
- Neoadjuvant (chemotherapy before surgery or radiotherapy) staging or radiation therapy or primary systemic means that treatment may have a secondary definition from information achieved after treatment as documented. However, patients are usually advised to have their clinical staging recorded, since this staging will be used for comparative purposes. Clinical stage comprises only information collected before starting the therapy
- Disease Progression: if or when there is documentation of cancer progression before the therapy or surgery, only the information found before documentation of the progression is used for staging.

- In case Staging has some doubt on T, N, or M categories, then less advanced classifications of T, N, or M, and prognostic factors are used.
- If Non-anatomic factors are not available, then stage grouping is assigned on a less advanced description for that factor. The less advanced description would mean that case allocated to the group assumes factor was least advanced or lower for example prostate cancer with, lower Gleason's score

2.2.5.6 Clinical Assessment Tools for Cancer Patients

Clinical assessment tools of cancer of cancer patients involve the use of Karnofsky performance status (KPS) and Eastern Cooperative Oncology Group (ECOG) performance status (Nicolas and Silvia, 2013). ECOG Performance Status was published in 1982, and since then it was widely used in many clinical areas. ECOG performance status is used when conducting cancer treatment for clinical trials in many hospitals, cancer centres, and clinics. It is also used when required a standard criterion for measuring how the disease affects a patient's daily living activities. ECOG is a measurement tool that outlines a patient's level of functioning, their physical activities and ability to perform their daily activity. Nicolas and Silvia (2013) study explain the need to appraise Karnofsky Performance Status, that is measurement tool used for cancer patients to assess their impaired functions, their therapies effectiveness and evaluation of prognosis of a patient. Kaenofsky first appears in textbooks in 1949 and provides the full functional status of patients ranging on an 11-point scale comparing it with percentage values that range from 100% (when there is no evidence of disease, no symptoms) to 0% at (death). ECOG appeared in literature in 1990, and they are currently used in the clinical areas. These two tools are broadly using to assess the functional status of a patient with cancer.

Table 2.1: Comparison of ECOG and Karnofsky

ECOG PERFORMANCE STATUS	KARNOFSKY PERFORMANCE STATUS
	100— the patient is stable, has no complaints and no evidence of disease
0-score — when the patient is entirely active, capable of carrying out all functional performance without limitation.	**90**— the patient is capable of carrying out the regular activity and has minor signs or symptoms of the disease
	80— the patient has an effort on healthy activity and demonstrates some signs or symptoms of the disease
One score — when the patient has constrained in strenuous physical activity but mobile and able to do light work such as office work and light housework,	**70**— patient unable to carry out active work or regular activity but can perform self
Two scores: when patients are mobile and able to do all self-care though not able to carry out any light work activities of up or more than 50% of waking hours	**60**— the patient can perform most of the basic personal needs but sometimes requires assistance
	50—patient considerable requires assistance and regular medical care
	40—patient require special care, assistance and are disabled.
Three scores: Patient is capable of only limited self-care; confined to bed or chair more than 50% of waking hours	**30**—patient with severe disability necessitating hospitalisation though death is not imminent
4score- patient presents has a complete disability, not able to carry out on any self-care and entirely confined to chair or bed	**20**— the patient is very sick, hospitalisation and active, supportive care is compulsory
	10— the patient is declining or deteriorating
Five score —Deceased	**0**—Deceased

2.2.5.7 Therapeutic Modalities of Cancer Disease

Cancer treatment is dependent on a multimodal therapeutic approach and considering how these various therapeutic modalities complement each other. Such a combined treatment plan is a vital aspect of successful oncology case management. While cancer treatment modalities increase the survivorship of cancer patients, it is equally important to note that this treatment also increases toxicities from repeated antineoplastic therapies. Thus pain management is a challenge in cancer patients as complexity increase with cancer therapies that result in chronic illness (Burton et al.,. 2007).

According to WHO (2017), treatments of cancer process to eliminate cancer cells or slow down its growth and may eventually minimise pressure pain. Therapeutic approaches depend upon the stage and type of cancer. Treatment of cancers involves the use of surgery, hormone therapy, radiation therapy, immunotherapy and chemotherapy. Apart from this, supportive care such as hospice and palliative care approach is necessary for controlling of symptoms such as cancer pain and provision of psychological support. On the other continuum, therapeutic approaches of cancer may be sophisticated and pose challenges when controlling cancer symptoms. One main limiting factor for cancer cures is the toxicity of radiation therapy or chemotherapy to normal tissues. The dosage required for antineoplastic agents to kill resistant tumours would also result in patient mortality.

Surgery

Surgery is one type of treatment modality in cancer. According to NCI (2015), surgery is the removal of cancer cells or tumours from a patient's body and carried out by the specialised surgeon. Surgery is usually a cut through skin, muscles, and sometimes bone and such a cut are painful that patients require anaesthesia. The purpose of surgery is to

remove a part or an entire tumour contained in one area or to debulk, which means removal of an entire tumour or the body part. Partial removal of a tumour can provide better working treatments and minimises symptoms of cancer. Surgical removal of a tumour that is causing pain or pressure is also performed.

Radiation therapy

Radiation therapy or use of high level of energy exposure to the part of the body affected by cancer cells, to either shrink the cancerous cells or kill (NIC, 2011). The significance of radiation therapy is for cancer treatment and ease of numerous symptoms of cancer such pain.

There is External radiation therapy that uses of large machine to treat a specific body part such as lung cancer radiation and internal radiation therapies that utilises solid or liquid substance for systemic treatment of the body. The systemic treatment goes into the blood, then tissues throughout the body, seeking to kill cancer cells and minimise pain. The utilisation of radiation therapy will depend upon many factors that include: The size of a tumour, the location of a tumour in the body, the type of cancer and proximity the tumour to normal tissues. Radiation therapy is known to minimise the cancer pain.

Chemotherapy

Chemotherapy is a method of cancer treatment, in which chemical or drugs are used to kill or damage cancer cells (NIC 2015). Cancer cells usually snowball and divide, but chemotherapy will slow their growth or stop and minimise pain. Chemotherapy is used to cure cancer, increasing the chance of survivorship, slowing the growth of cancer cells or stops it. Chemotherapy will also ease cancer symptom and will shrink tumours that are causing pain and pressure. Some patients may only receive chemotherapy only while others may combine with other therapeutic approaches. For example, chemotherapy can

be used before surgery or radiotherapy to make tumours smaller, and it is known as neoadjuvant chemotherapy. Therefore, the types of chemotherapy approach will depend upon the level of metastasis or stage of cancer, type of cancer and other health comorbidities.

Immunotherapy

Human body evolves active defences from the immune system. The human immune system comprises a widespread distinct cell. Lymphocytes play a fundamental role of giving the specificity of immune recognition. Thus, the immune system can interact, directly or indirectly, with almost every cell in the body. However**,** Immunotherapy is biological therapy for cancer treatment that aims to boosts the natural body defences in order to combat a cancer cell. Immunotherapy is an approach of treatment with side effects that more often mimic flu-like symptoms and vary according to the type of therapy given (NIC, 2015).

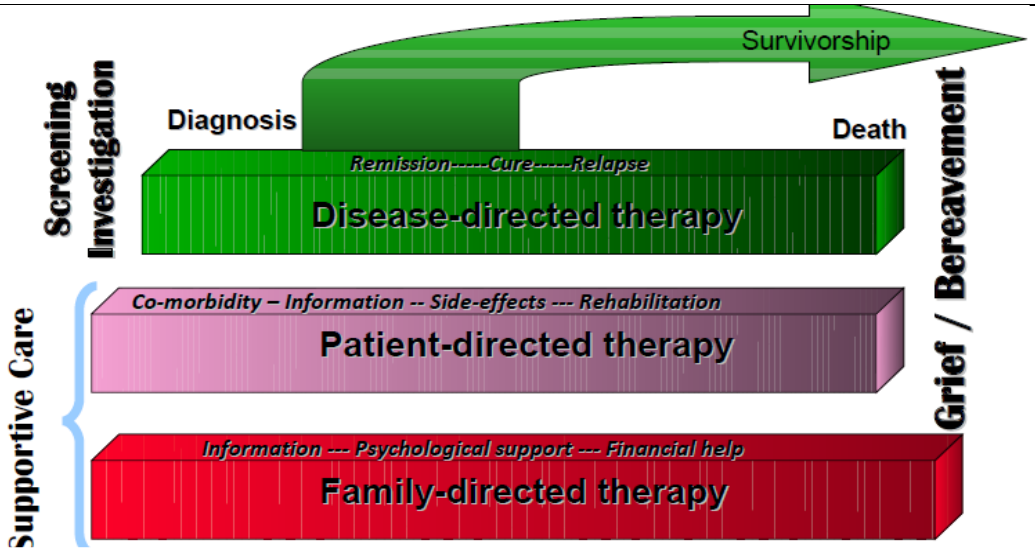
Hormonal therapy

Hormones are described as substances that are natural and prepared by body glands and provide many roles in the body, such as the activity of specific cells, organs and growth in the body cell. However, hormonal treatments are the utilisation of hormones as medication to lower or stop hormones in the body. Reducing or blocking a specific hormone will inactivate or halt the growth of cancer and subsequently reduce the pressure of cancer pain. According to the American Cancer Society (2017), Hormonal therapy is a type of systemic therapy for cancer treatment and ways to prevent the oestrogenic growth of cancer cells. Most of this therapy for breast cancer lower level of oestrogen or stops oestrogen from acting on the breast with cancer cells.

Stem cell transplant

A stem cell is a potent source of multiple cells with lineage and can renew stem cell pool and to segregate into specialised cells giving appropriate signals in the body. Stem cell transplant is one form of therapeutic approach for cancer treatment. Stem cell transplants can cure some patients with cancer while for some others it may lead to severe complications or even death. Stem cell process involves several steps that include; Preparation of patients emotionally, financial, tissue typing, health history and physical examination. Once a stem cell has been performed, cancer patients experience minimised pain.

According to Raphael et al., (2010) Cancer disease treatment procedures have been associated to stimulate pain in patients. Treatment modalities like radiotherapy, chemotherapy, hormonal therapy, bisphosphonates and surgery are standard methods and palliate malignantly. In some other studies, cancer treatment is associated with relieving pain such as radiotherapy.



Adapted from (British pain society, 2013)

Figure 2.2: Model of cancer disease management

2.3 Cancer pain management

2.3.1 Introduction

This part of chapter two is on critical analysis of studies and policies on cancer pain management. It explores the significance to understand on the prevalence of cancer pain, pathophysiology of pain, classification, assessment and management approach to cancer pain. Management of cancer pain is also subdivided into subtopics like patient-related factors, institutional factors (staff, policy and medications) and social-cultural perspective, to understand better and interpret the main factors that may influence cancer pain control.

Pain is subjective and a complex symptom that results in a mixed mechanism. Pereira et al.,. (2013) Explains that cancer pain comprises of ischemic, neuropathic, compression mechanisms at multiple sites and inflammatory. Cancer pain is a diverse individual experience associated with mood, history, expectation, culture and genetic modifications. Fornasari (2012) suggests that pain in cancer can be classified as chronic or acute depending on the duration and onset. For instance, in acute pain syndromes, there is an abrupt, with a distinct start, recognisable source such as surgery and it is fight or flight responses that are predictable to recover with management.

However, chronic pain has a less recognition start, fluctuating and prolonged course. It is determined by sensitisation in the central nervous and neuroplastic reactions from a severe injury, and it is sometimes called the breakthrough pain. In addition, cancer pain has similar neurophysiologic pathway like any other pain. Cancer pain goes through the nociception process that involves the sensory afferents activation by persistent harmful stimuli resulting in the transmission, transduction, modulation, and perception.

WHO (1986) established a 3-step analgesic ladder for management of pain globally, and a validation study was done in 10 years later demonstrated that over 70% of patients with cancer could successfully relief pain using a recommended analgesic ladder. Despite this progress, cancer pain remains a significant problem today, especially in the developing countries. Cancer pain prevalence has been reported to in ranges of between 60% to 80% in advanced cancer, interfering with activity, affecting the mood patient, interfering with the enjoyment of life and leading to mental health illness such anxiety and depression.

2.3.2 Cancer Pain Prevalence

Malloy and Ferrell (2011) did a study on the global occurrence of pain in cancer, which estimates the cancer pain prevalence as 25% in newly diagnosed patients, 33% in patients undergoing active treatment, more than 75% in patients with advanced disease. Survivors who completed their treatment also reported about 33% of the chronic pain. The development of chronic pain syndromes in cancer survivors was associated with radiation that caused brachial plexopathy and pelvic pain, chemotherapy caused by painful peripheral neuropathy and surgery that caused neuropathic intercostal nerve injury following thoracotomy and mastectomy pain. In addition, Van den Beuken-van et al., (2007) study evaluated cancer pain occurrence worldwide in a collective data from 52 articles and revealed that prevalence of pain is high in a specific type of cancer, an example was cancer of pancreatic with 44% and neck, and head cancers was 40%. The prevalence of pain in cancer was also found to be 64% in patients with advanced stage disease, patients on anticancer treatment was 59%, and patients after curative treatment had 33%. Over one -third of patients with pain reported moderate or severe pain. The combined prevalence of cancer pain was over 50% in all types of cancer with the highest occurrence of 70% reported in-patient with head/neck cancer. Goudas et al., (2005) study

on cancer-related pain occurrences estimated that 30% to 50% of patients under chronic treatment had pain and over 70% in patients with advanced cancer.

Breivik et al., (2009) study on European Pain in Cancer Survey, carried out in 11 countries in Europe that included Czech Republic, Italy, Norway, Romania, Sweden, Switzerland, Denmark, Finland, France, UK, Ireland and Israel from the year 2006 to 2007. Survey aimed to explore patient's perspective of pain experience to increase understanding of cancer-associated pain and treatment in all cancer stages and types across Europe. This study was carried out in two phases. Phase one was meant for screening to identify cancer patients are experiencing pain at least once a week. The second phase aimed to carry out in-depth telephone interviews by selecting patients randomly from the population who were screened in the first phase. The sampled population was 5084 adult patients from Europe and Israel who communicated for screening interviews. Out of 5084 patients contacted 2864 completed the screening interview who graded their pain intensity as greater than score 5 of Numeric Rating Scale of 5-10 and reported regular pain in several times a month lasting for more a month that also included skin cancer patients. Demographic data regarding sex and type of cancer was not captured in 35 patients during screening. However, the rest of 5049 patients were composed 40% male and 59% female. The average age of respondents was ranged between 50 years to 59 years, and most frequent type of cancers was bowel, colorectal cancer $n = 500$, lung cancer $n = 414$ breast cancer $n = 1415$ and prostate $n = 615$. Prevalence of cancer pain was 72% among the screened participants with the exclusion of skin cancer patients. Cancer patients experiencing pain several times in a month or more were 3066. Patients who reported moderate-to-severe pain at the scale of 5–10 were 2873, those who rated the severe pain at the scale of 7–10 were 1349 and those who reported 'worst *pain imaginable'* of the scale of 10 were 110. Highest occurrence pain

of over 85% was reported by patients with cancers of lymphoma, lung, and head and neck pancreas, bone, brain, and those with lowest of the prevalence of pain of less than 75% were patients with cancer of leukaemia and prostate.

Breivik et al., (2009) study randomly selected 573 patients for a detailed interview from all countries, except for the Republic of Ireland and 50 participants were recruited. This study has revealed that the most common type of cancer was 155 cases of breasts, 68 cases with colorectal, followed by gynaecological that accounted for 53, lung 47, prostate 36, and head and neck 33. This study thus revealed that cancer pain remains a challenge in Europe and Israel.

Beck and Falkson (2001) carried out a study on the prevalence of cancer in South Africa in two phases. The initial phase of this study entailed the screening of 263 patients who recorded their pain frequency in varying settings. This study reported that 94 patients experienced cancer-linked pain account for 35.7% and patients in hospital reported a higher frequency of pain than outpatients perhaps the majority of inpatients could be acutely ill. This survey also noted that black people had 56.1% of cancer pain prevalence that was higher than among the whites accounting for 29.4% and the discrepancy was more prominent in the outpatient situation. Phase two of this survey involved 426 participants with cancer pain from diverse settings who completed questionnaires. Approximately one-third of the all the patients experienced '*worst pain'* of severe intensity. Black population had a cumulative experience of moderate to severe pain intensity in 'worst pain' at 81%, this is compared with 65% of '*worst pain'* experienced by the White population. The entire sample had a negative score on the pain management index at 30.5% as compared the most effective analgesic used by a patient relative to their worst pain. This study concluded that the cancer pain remains uncontrolled and it is a

considerable problem in the region. In addition, Van den Beuken-van et al. (2016) study on a systematic literature review of publications from September 2005 to January 2014, using numerous databanks, found those 4117 titles and 122 studies.

Van den Beuken-van et al., (2016) study established ish the rate of prevalence pain in cancer at 39.3% following curative therapy, 55.0% when on anticancer treatment and 66.4% in the late stage of cancer. This study also revealed that increasing cancer pain frequency at 38% for all patients with moderate to severe pain of above five at the scale of 5-10 points. The study further concluded that regardless of the improved consideration in the assessment and management of cancer pain, yet average to severe pain remain common symptoms in cancer patients.

Namukwaya et al., (2011) studies on a review of articles on cancer pain management in African countries, at Makerere University College in Uganda reveal that moderate to severe cancer pain is very common. Being commons leads to poor quality of life in most resource-limited patients in African countries. According to Namukwaya et al., (2011) study also revealed that the occurrence of cancer pain ranges from 35.7% to 87.5% in many African countries and most patients report to health facilities in the late stage of cancer diagnosis due to an inadequate screening of the disease. Thus, this study concludes that many countries in African have a high prevalence of cancer pain and limited literature on the same. Tegegn and Gebreyohannes (2017) conducted a study for analysing the correlation between cancer pain occurrence, interference of cancer pain and the suitability of treatment of cancer pain at oncology ward in Ethiopia. Participants were considered suitable at the age of 18 years and above, with any cancer, and admission of a specific period in the oncology ward. The study involved 83 cancer patients whom the met inclusion criteria. Seven patients were identified to experience severe pain while the rest

of 76 patients reported irregular grading of pain. The severity of pain interference on the functioning value of the cancer patients was measured using the multidimensional pain assessment tool (BPI) and 68 out of 76 patients reported pain interference of pain with their functioning. Of 68 patients with pain interference, 41 patients reported that pain posed moderate to severe interference with their functioning. Effect of pain on function was found to be statistically significant association with the presence of metastasis, stage of a tumour, history of treatment method, history of the adequacy of pain management. Cancer patients with tumour stage I and stage II and patients adequately treated were less likely to have pain interference on functioning. The pain was more likely to interfere with the quality of patient functioning in patients with metastasis and those who had a history of both surgery and chemotherapy treatment. However, Pain was about 16 times more likely to interfere with functioning in patients who had a history of a pain than those who have never experienced pain before.

Huang et al., (2013) study utilised face-validated tool in Swahili version that includes the Faces Pain Scale-Revised and the Numerical Rating Scale to determine hospitalised patients' pain levels of 400 HIV/AIDS and cancer patients at Moi Referral Hospital in Kenya. This study reported 66% of patients had undertreated pain with negative scores pain management index. Ndegwa (2013) employed BPI questionnaires to assess the presence of cancer pain, severity and management of 520 ambulatory patients in the oncology unit and reported 38.5% of cancer pain frequency among the participants. According to Ndegwa (2013), severe pain experience is associated with the patient in late-stage diagnosis of cancer and found most patients in developing country seek help during this stage. Ndegwa (2013) further explained that over 65% of outpatient reported inadequate pain management of which 47% of these patients were on non-opioids, those who were not on any analgesics accounted13% and those who were on strong opioid such

as morphine were 10% of the total participants. This study concludes that cancer pain is widespread, and the management is very inadequate in the Kenyatta national hospital. Huang et al., (2013) studies agreed that the high prevalence of cancer pain in Kenya, though both studies did not represent level five or four hospitals in rural Kenya. However, the high prevalence of pain reported in both studies may reflect the everyday challenges of cancer pain in many developing countries such restricted treatment options for cancer, patients presenting in an advanced stage, and with limited choice and inadequate availability of analgesics. On the other continuum Huang et al., (2013) demonstrate a high prevalence of cancer pain through no standard validated assessment tool for pain assessment in Africa or Kenya exist. These studies also had variation in the ranges of pain prevalence report. Furthermore, pain is a subjective aspect of human feeling, and it is a challenge to measure. In addition, Ndegwa (2013) utilised BPI tool which does not consider the importance of other aspects of cancer pain management, such as compliance to therapy by the patient, the level of dosage and route o analgesic given, possible interactions with other analgesics or other non-pharmacological therapy and adjuvant drugs.

2.3.3 Pathophysiology of Cancer Pain

Raphael et al., (2010) study from a consensus health care professional's group document emphasises the better understanding of pharmacological, pathophysiology, oncological, and psychological management of cancer pain. According to Raphael et al., (2010) study WHO analgesic ladder documents that cancer pain relief has assisted many patients globally, though it may have restrictions in the context of longer survivorship patients with increasing disease complexity. Raphael et al., (2010) study further emphasised the need for mechanism-based, multimodal therapy on a better understanding of

pathophysiology. Understanding of cancer pain pathophysiology and treatment based on the same is very vital since the longer survival of cancer patients is on the increase.

Von Gunten's (2011) published a paper that noted the modern cancer pain management requirement is the current understanding and implementation of the pathophysiology of pain. Von Gunten's (2011) suggests that treatment methods are selected based on the established or actual pathophysiology of cancer pain. Thus, rational oral polypharmacy use controls cancer pain to patient's satisfaction at 70%-90%. While cancer pain pathophysiology is a mixed mechanism and hardly presents as a pure neuropathic, visceral, or somatic pain syndrome but the need to understand and implement treatment based on the pathophysiology is necessary.

Kay et al., (2007) on postal questionnaire survey studies of 106 responses, explain that pain is a noxious stimulus to response in three main categories during transduction. Mechanical type of response comes as result of pain associated with the pressure exerted by swelling, abscess, incision or a tumour. The other category is thermal that is pain associated with burns and the chemical aspect that responses to a noxious stimulus and is associated with excitatory neurotransmitter, toxic substance, ischemia or infection. British Pain Society (2013) document emphasizes that the optimal relief of chronic cancer pain depends on consideration of the underlying pathophysiology and molecular mechanisms that include invasion of a tumour on the local tissues, metastatic bone pain, ischemia, inflammatory pain, visceral obstruction, compression on nerve and plexus invasion, bone with osteoporosis and deteriorating joint pain in elderly. Wood (2008) study on a review of literature upholds that noxious stimulation facilitates to discharge some mediators from cells that damaged. These mediators include substance P, potassium prostaglandin, bradykinin, histamine and Serotonin that trigger the nociceptors and then

produce noxious stimuli for generation of pain impulse. British Pain Society (2013) document explains that depolarization and repolarisation action potential at the cellular level due to the exchange of Sodium and Potassium will result in the generation of pain impulse which subsequently will be transmitted in three stages of pain transductions. Wood (2008) study describes that the first process of pain impulse that starts with transduction through the nociceptor fibres transmitted into the dorsal horn of the spinal cord. The next stage of transmission of pain impulse begins from the spinal cord into the brain stem. Pain is then transmitted through the networks between the cortex, thalamus, and higher levels of the brain. British Pain Society (2013) documents also state that impulse of pain is transmitted from the spinal cord to thalamus and brain stem through two central ascending pathways. These pathways are a spinothalamic and spinoparabrachial pathway. However, it is believed that the brain does not have a discrete pain centre, so as the impulses arrive in the thalamus and are channelled to multiple areas of the brain where they are managed. Thus, the perception of pain by an individual may be explained as complex. The below explains the Cancer Pain Pathophysiology model regarding oncology, pharmacology and psychological aspects. This model is adapted and recommended by the UK Association of Palliative Medicine and the Royal College of General Practitioners.

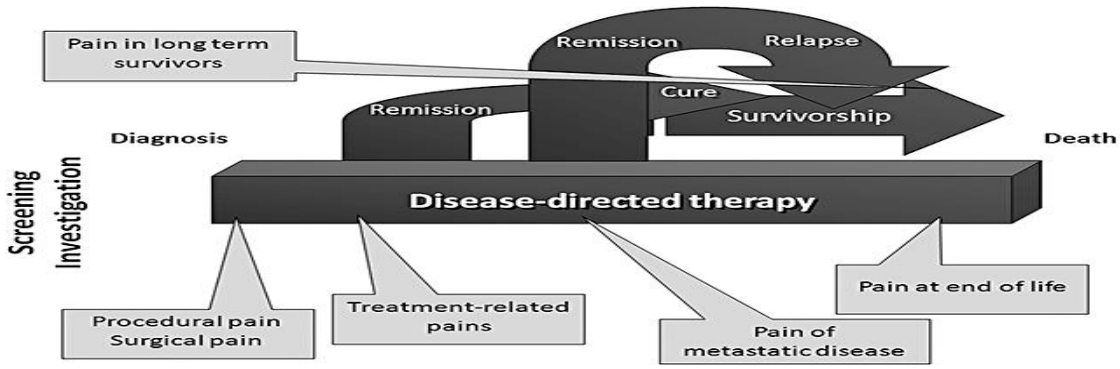


Figure 2.3: Adapted from British Pain Society 2013

2.3.4 Classification and types of cancer pain

Holtan et, al (2007) Classified cancer pain using questionnaires based on the Brief Pain Inventory of 453 patients. Holtan et al., (2007) study found that that information on the classification system of pain would guide to enhance clinical decision-making and research interpretation. Inadequate assessment and inadequate common descriptors for classification appear main reasons for poor cancer pain management. Knudsen et al., (2009) study on a systematic literature review to determine classification systems of cancer pain evaluated 92 papers. This study also found that limited standardise classification systems in cancer pain. Holtan et al., (2007) study further noted the absence internationally acceptable classification system for cancer pain that poses challenges in pain management of cancer pain.

Similarly, Yennurajalingam et al., (2014) study utilised Edmonton Classification System for Cancer Pain (ECS-CP) tool to assess variables of 100 cancer patients and found that majority of patients, signifying its utility as routine clinical practice, fruitfully completed ECS-CP. Yennurajalingam et al., (2014) suggested that although there is no universal standardised pain classification assessment tool in research and clinical practice, ECS-CP can provide valuable information for pain assessment.

Haugen et al., (2010) study did a systematic literature review on types and classification of cancer pain. This study found the absence of standardised documented definition and classification of pain as well as an assessment tool for cancer pain, especially when dealing with breakthrough pain. On the other hand, Knudsen et al., (2011) cross-sectional study from data gained at an international centre and multicentre of 2278 cancer patients treated with opioids, found psychological distress and breakthrough pain as significant variables to pain classification of cancer patients. Namukwaya et al., (2010) study of

reviewed literature on cancer pain management in resource-limited countries, explained that cancer pain might be classified based on the underlying mechanism as either nociceptive pain or neuropathic pain. Namukwaya et al., (2010) further elucidate that, cancer patients may experience nociceptive pain caused by an assault on the bone, soft tissues or viscera. That is an acute somatic or visceral tissue that will cause nociceptive pain and patients describe this as "aching", "stabbing", or "throbbing. Injury to viscera is poorly localised and most likely assumed somatic pain because of merging impulse on somatic afferents inside the dorsal root ganglia and dorsal horn. Thus, patients may describe viscera nociceptive pain as "cramping" or "gnawing" if pain affects organs like heart, bladder or bowel obstruction.

On the other continuum, Knudsen et al., (2011) study on a review of the literature suggests that neuropathic pain is a result of nerve compression or infiltration. Knudsen et al., (2011) further outlines that this pain is produced when there is an abnormality with central or peripheral nervous system which is characterised by burning pain (paraesthesia) or shooting pain (lancinating) with aching sensation relieved by the application of pressure on the affected part. Thus, the patient presents with increased pain sensitivity (hyperalgesia) or allodynia. In addition, pain related to the specific situation has also been reported among the cancers patients that can be controlled such as breakthrough pain, incident pain and procedural. Knudsen et al., (2011) also emphases that cancer pain can be categorised as the absence of pain with the score (0), mild pain (1-3), moderate (4-6) and severe which scores (7-10) using numerical scale assessment.

2.3.5 Cancer Pain Assessment

Clare (2013) study on a review of the literature, highlights the fact that insufficient assessment of pain is assumed as the principal obstacle to proper management of pain and

thus identification of pain must begin at prior diagnosis, which includes a detailed history, physical examination and psychosocial evaluation. Brawley et al., (2009) study on a systematic review of the literature suggests that proper pain assessment enhances proper diagnosis and management. Pain assessment is a continuing process that begins with a complete evaluation of the patient's own experience, presentation of symptoms, functional capability and history of clinical presentation that may be a challenge in many cancer settings. While Fallon et al., (2006) study on literature review, revealed that an estimate of 80% of patients with cancer could adequately manage pain using cheap oral drugs given a proper assessment of pain and suitable choices of analgesics. Hjermstad (2008) carried out a study on an intensive literature review of 230 publications upholds that palliative care pain assessment tool appear to be a continuous process which does not adhere to systematic guidelines and universally accepted tool. Thus, the need for widely literature reviews with patient input and clinical studies guided by expert opinion. This assessment tools should be based on international consensus. An accurate assessment and diagnosis of cancer pain, type and severity of pain and its effect on an individual patient, is necessary for the plan of interventions. Fallon et al., (2006) study also explained that cancer pain experience is a complex multifactorial symptom and the concept of classification of the different pain characteristics may be a challenge in the assessment phase. The psychological and patient-related factors mostly influence the pain experience and thus guide the appropriate treatment of cancer pain.

The assessment requires a standard tool, though no standard scale for all health institutions globally exists. Thus, the gold standard in patients' self-reported pain. According to European Palliative Care Research Collaborative (2009) document states that are there are a diversity of pain assessment tools designed to assess cancer pain and utilisation of such tools are expected to address an aspect of validity, patient's age,

cognitive abilities, common cancer pain syndromes, medication records and language use. British Pain Society (2013) document also outlines that some recommended tools for clinical trial research include, the *Visual Analogue Scale (VAS*) where patients briefly score their pain using the different facial expression so as get the quality and intensity of pain. There is also the *Numerical Rating Scale (NRS), and Verbal Rating Scales (VRS*) is recommended especially for very elderly patients with cognitive impairment. Thus, pain Measurement tools are perceived to be important in order to evaluate pain intensity and relief.

In addition, the British Pain Society (2013) document highlights that expert groups on pain management recommend three multidimensional tools of pain measurement. These are the *Brief Pain Inventory (BPI),* McGill *Pain Questionnaire and Memorial Pain Assessment Card*, that can be used to measure the severity score and pain relief. Hjermstad et al., (2009) revealed that the Brief Pain Inventory is a multidimensional tool that is a valid and clinically used for pain assessment extensively in people with cancer. BPI has a diagrammatic message for the location of pain, inquiries concerning pain current pain, average, worst and intensity of pain using a scale of 0 to 10 rating,

2.3.6: Brief Pain Inventory Questionnaire

The Brief Pain Inventory (BPI) is a multidimensional questionnaire tool (Appendix 5) for pain measurement. British Pain Society (2013) document states that BPI has been used in many clinical studies for pain assessment and effectiveness of pain treatment. It has utilised and accepted in different countries and has demonstrated reliability and validity even when used in different cultures and languages. The Brief Pain Inventory questionnaire has two parts with first part concerning with the absence or presence of

cancer pain, while the next part is dealing with the severity of pain, pain effect on the patient's general comfort and pain management

Huang et al., (2013) studies in Kenya utilised BIP, and state that occurrence of cancer pain is determined by dividing number of patients/respondents who gave a definite answer to the questions against the total patients who participated in the study. This question will ask the patients to link their pain to either their primary disease, the effects of cancer treatment or another medical condition. An affirmative answer will then lead to part two of the questionnaire, that demonstrates to identify the site of the pain, pain severity when it is at worst or least for the last one week or on average using NRS of 1 to 10. Patients will rate the pain at the time when they are filling out the questionnaires. Aggravating and relieving factors will also be assessed, a medication used, and nonpharmacological therapy will also be determined and level of pain relief it provides.

Effect of cancer pain is generally on the patient's daily physical activities, mood, sleep, walking, routine duties, the comfort of life and relation with other people will be determined using the numerical scale of 1-10

An example of other tools that can be used for pain assessment is shown in Figure 2.4 and 2.5 below.

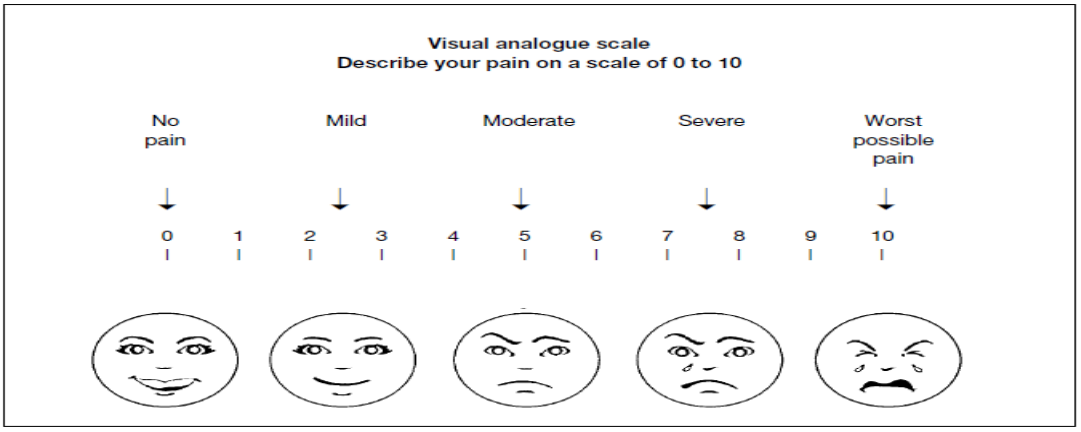


Figure 2.4: Visual Analogue –Wong-Baker Scale

(Adapted from Guidelines on Pain Management &Palliative Care of European Association of Urology)

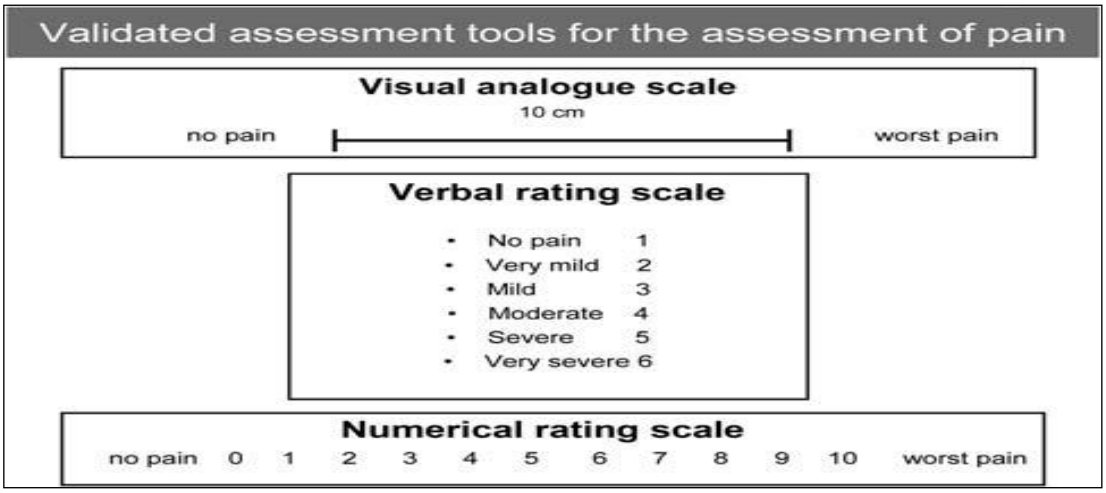


Figure 2.5: Common Tools for Pain Assessment Adapted from Ripamonti1 et al., (2012)

2.3.7 Effect of cancer pain

Cancer pain has negative impacts that include emotional distress, clinical depression, mood disorders. The most commonly occurring symptoms in cancer are a pain, emotional distress and fatigue (van den Beuken-van Everdingen 2012). An approximately one-sixth of all cancer patients have depression and about one quarter have other mood disorders during treatment (Bortolon et al., 2014). Cancer pain leads to the development of clinical depression, decrease adherence to treatment or therapy, increased suicide rates, more extended hospitalisation, poor quality of life and heightened desire to die **(**Trancas et al.

2010). Moreover, Chronic cancer pain also interferes with a different component of patient's life and negatively affect their daily activities, mental health, family and social relationships with others and interactions at the workplace, and similar studies revealed poor quality of life in cancer patients at Kenyatta national hospital in Kenya (Mwanda et al., 2004).

2.3.8 Approaches to Cancer Pain

Cancer patients frequently report pain, which requires appropriate approaches for its control. Suitable assessment involves measuring pain intensity; expounding the impact of pain on patients' psychological, social, spiritual. It also considers existential domains, creating treatment adherence and responsiveness. Sun, Koczywaz and Choi (2007) study did a model of care on barriers to cancer pain management using survey questionnaires with sample size 100 respondents, identified that barrier to cancer pain management as in three categories. These categories are the patients' perspective, professional and health system. Thus, there is a need to consider these factors to achieve optimal cancer pain management. To understand and explore on pain management, the literature review in this study will consider factors concerning health system perspective to pain management (policy/system, drugs), health professionals, patients perceptive and their social-cultural aspect of pain perception and response. Finally, the steps of developing a care model and the cancer pain management model.

2.3.8.1 Health system perspective of Cancer Pain management

WHO (2014) document highlights that quality of life in cancer patients can be improved with adequate pain management and this can be found in palliative care settings with a multidisciplinary team. WHO developed cancer pain analgesic ladder that emphasises on

the use of analgesics, adjuvants, education support and monitoring that is offered by a multidisciplinary team approach with psychosocial support.

According to Vargas-Schaffe (2010) WHO analgesic ladder of 1986 for pain treatment starts with use nonopioid medications such as nonsteroidal anti-inflammatory drugs, aspirin and paracetamol (Step-1) and when the pain continues, then followed by introduction of a weak opioid-like codeine for mild pain to moderate pain, adding this to NSAIDs (Step 2). When this medication does not offer adequate pain control, then strong opioid will be utilised such as morphine for moderate pain or severe pain or pain that are not managed by analgesic Step 2, is managed with stronger opioids (Step 3). However, products fitting to the same category will never be used concurrently. The analgesic ladder also encompasses the option of plus adjuvant therapy to calm fears and anxiety associated with cancer disease.

W.H.O. strategy depends on the primary use of opioids especially morphine. However, the role of the adjuvants is unclearly explained. Mercadante and Fulfaro (2005) revealed a 90% satisfactory response on pain control with use of WHO analgesic ladder. However, Phillip et al., (2013)study on the level of pain relief and patient satisfaction found no relationship between pain intensity score and patients' satisfaction in general cancer pain management. Phillip et al., (2013) argued that the association between patients' satisfaction and pain control does not depend on the pain intensity experienced but rather on factors like health workers perspectives and patients' perception on pain relief.

WHO (2018) explains how to maintain freedom from cancer pain. Freedom from pain can be sustained if the clock" gives pain medication, instead of on 'demand' and it is offered every 3-6hours. WHO analgesic three-step ladder is also expected to be administered in the right dose, for the right patient and of the right drug and at the right

time, thus will enhance an estimate of 80% to 90% effective response. Subsequently, if the medication does not control the cancer pain, a surgical intervention is done on appropriate nerves to provide further pain relief.

Vargas-Schaffe (2010) article further outlines the five fundamental recommendations of WHO ladder analgesic use for the achievement of adequate pain control. These are five simple recommendations that include the following:

1. Oral administration analgesics: oral medication is seen as advantaged whenever possible.
2. The regular interval of the usage the analgesics: For adequate pain control, it is essential to respect the period of the medication's efficacy and prescription of the dosage to be administered at specific intervals by the patient's level of pain. The dosage of medication depends on the intensity experienced by the cancer patients and should be adjusted until the patient is comfortable.
3. Pain intensity is evaluated using a scale and prescriptions of analgesics are made in according to pain intensity. That pain management drugs need to be prescribed following adequate assessment of the pain and clinical examination of the patient. It is essential to believe in patients' reports as crucial assessors of their pain and not the perception of medical staff.
4. The dosage of analgesics drugs is adjusted to the individual patients' need and pain management dosage is not standardised. An individual patient is handled as he/she responds to pain. The dosage that is right for the individual patient is the dose that allows adequate pain relief. Consider achieving equality analgesic effect that adequately relieves pain.

5. Prescription of the analgesics should be a constant concern. The regular analgesic administration is essential for the adequate pain treatment. When the distribution of analgesics over a day is attained, then the personal documentation program is provided to the patient. Such an approach will provide the essential information about when and how to administer the analgesics to the patient.

However, Hannon et al., (2015) study of review articles argued that while access to palliative care services is a universal fundamental human right, millions of cancer patients in low and middle-income countries have limited access to palliative care services. Hannon et al., (2015) article further explained the need for critically ill patients to be pain-free and provision of dignified death through the integration of palliative services in health care system, right from the diagnosis stage of cancer. Heather Hawksley (2009) upholds that European Pain in Cancer (EPIC) study sampled more than 5,000 patients with cancer from 12 countries and revealed that cancer pain is high, frequent, long-lasting, and thus often ineffectively controlled, leading to poor quality of life in cancer patients. This survey found that 94% of patients had moderate to severe pain with a score of 5points or more on NRS of (1- 10points) for pain assessment. EPIC survey further revealed that a high number of patients with cancer pain do not get any prescription for pain relief in order to control their pain. Thus this was associated to be an obstacle related to the health system setting.

In addition, Antrobus and Munday (2007) postal questionnaire survey study of 106 responses revealed the challenges of referrals of cancer patients who need advanced pain management procedures due to lack of integrated services in many parts of the world. Sue et al., (2007) research also state the need for improvement on the use of long-acting opioids for optimal pain relief and barriers to an internal system like a limitation of

referral to supportive care services. Sue et al., (2007) study further found that professional and system barriers were the main barrier to pain management in health care services. The barriers require improvements especially on the aspect of pain assessment screening, re-assessment, evaluations and follow up care for cancer patients.

Deandrea and Apolone (2014) study on a systematic literature review of 46 articles published from MEDLINE and EMBASE from 1990 to 2012 on the management of cancer pain found that in spite the use of WHO guidelines on cancer pain management. Pain remains undertreated in many settings with pain management index (PMI) of 43.4% and a third of patients still not getting medications proportionate to their pain intensity. Thus, concluded that pain in cancer patients is undertreated many healthcare systems. Mercadante and Fulfaro (2005) study on literature review reported that WHO analgesic ladder for pain relief had given satisfactory pain relief of 90% in patients with cancer, though it has been criticised for lack of dynamic data to support its application. Mercadante and Fulfaro (2005) study explained limitation of whom pain relief ladder as due to methodology, the assessment of pain, small sample size, and high rate of exclusions, dropout and poor follow up of subjects with limited comparison with levels of analgesia before introduction ladder of pain relief.

Apolone et al., (2014) study on multicenter using prospective, non-randomize on 1801 patients to assess analgesics adequacy in comparison to the pain management index (PMI) and found noncompliance with a predefined set of clinical pointers of pain that range from 41% to 76%.

Apolone et al., (2014) study demonstrated that there is the poor quality of life due to poorly managed cancer pain control in most institutions secondary to undertreatment of pain and low utilisation of WHO ladder medication for cancer pain.

Kay et al., (2007) studies suggest that cancer patients require a balanced and purposeful continuum of health illness within their environment as such pain must be controlled in an integrated service. Pain control will maximise individual daily functioning whereas uncontrolled pain will limit an individual's capacity for self-care and affect their reaction to illness, hence compromising their quality of life.

Namukwaya et al., (2011) study on a review of systematic literature in Uganda, argued that African countries have several barriers to effective pain relief. Namukwaya et al., (2011) explain that barriers to pain control are lack of national policies, limited national standards and guidelines, lack of trained staff on pain management, focus on curative care rather than pain relief, restrictions on the importation, prescription and use of morphine. While cancer pain is involved, associated with declines in human functioning and physical health as well as the compromised quality of life, yet there are limited palliative services in Africa with little advocacy for pain relief.

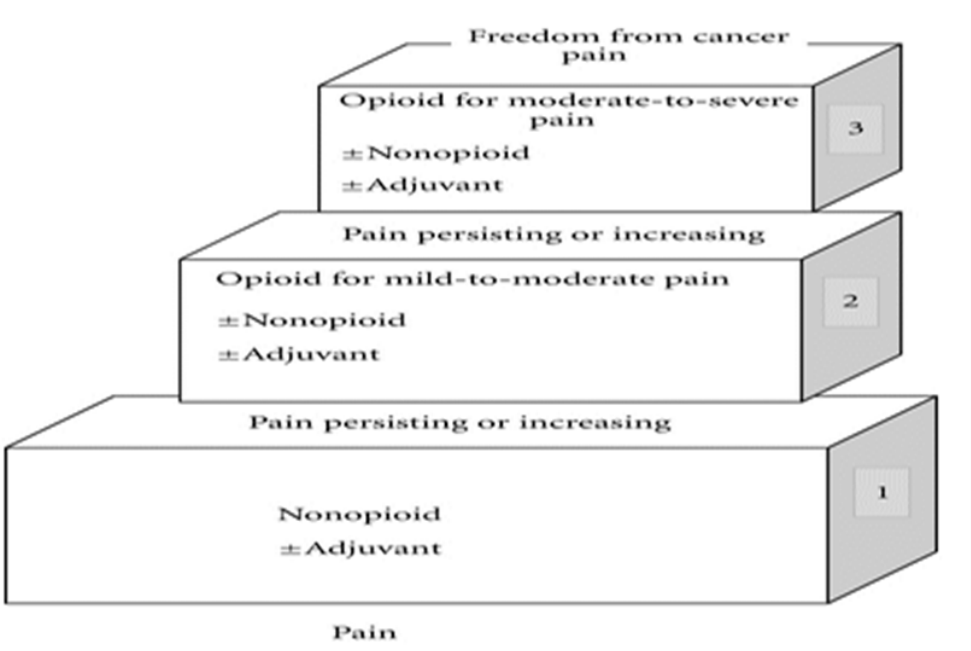


Figure 2.6: WHO Analgesic Ladder

(Adapted from British Pain Society document of 2013**)**

2.3.8.2 Nursing Care Perspective on Cancer Pain Management

Vallerand et al., (2011) did study literature publications on nurses' contribution to cancer pain management for the past three years. Vallerand et al., (2011) found that nurses have accomplished and considered the significance of pain assessment and the use of evidence-based practice in the management of pain. Nurses are involved in intervention-based research, palliative care and patient education to enhance cancer patients' self-care. This study also found that nurses advocate for empowering patients to participate in self-management of their pain and support to provide education to patients, their families and significant others at their most vulnerable times.

Vallerand et al., (2011) study also found that nurses did research and have been at the forefront to develop and test new tools for pain measurement and explicate pain experiences through qualitative methodologies, measured the quality of cancer pain care in patients and its effect on their caregivers. While nurses have advanced in practice, progressed in research, and contributed to education on cancer pain management, there are exit challenges in cancer pain management.

Hjermstad (2014) carried out a study in 2013 at selected institutions providing cancer treatment in Ethiopia and intended to assess Nurses' knowledge on the management of cancer pain a using a cross-sectional method with qualitative design on 82 nurses. The Nurses filled self-administered questionnaires (Knowledge and Attitudes Survey Regarding Pain) and participated in three focus group discussion. Nega et al., (2014) revealed that 35.4% of nurses demonstrated excellent knowledge of cancer pain management and answered questions correctly at a mean score of 12.6 (37.1%). Nurses work experience on an understanding of pain had a statistical significance of $P<0.05$, though no statistical significance was not for the rest of socio-demographic variables.

This study revealed that inadequate knowledge regarding cancer pain management was noted. Inadequate education in both pre-service and in-service training was perceived as barriers to proper knowledge on cancer pain management.

Nega and Mulla (2013) did a similar study assessment of nurses' practice, attitude and barriers to cancer pain management at government and private institutions in Ethiopia. The study was on both focus group discussion approach and self-administered questionnaires on 82 nurses. Nurses who participated composed 45(54.9%) from government hospital while those from private hospital comprised of 37(45.1%). This study found that nurses' negative attitude was at 53.7% accounting for than half of the respondents. Likewise, 65.9% of nurse demonstrated inadequate on the practice of cancer pain management. This study revealed the absence of related course on pain management in undergraduate classes, poor continuous training on the same, confusion of roles, overwhelming work overload and poor remuneration was reported as main barriers for effective cancer pain management.

De Silva and Rolls (2011) study on nurses' attitude, belief and practice at a Sri Lankan government hospital using semi-structured interview found that nurses performed poorly in the management of cancer pain because of limitation of resources, poor workload allocation, shortage of nurses and lack of autonomous in cancer pain management. Thus, nurses in Sri Lankan government hospitals worked in a task-oriented system that never allowed them to acknowledge the need for cancer patient's pain management. Samarkandi (2018) carried out a study on nurses' attitude and knowledge in pain management at Saudi Arabia using across section survey. 300 questionnaires on knowledge and attitudes study concerning pain were administered to the participants and respondent rate was 82% (240). Questions correctly answerer were 18.5 at the standard

deviation of 4.7, this was out of 40 if all questions were answered as expected with a range of 3-37. Females participants scored higher at a mean score of 18.7, SD 5.4 while males participants scored less at a mean score of 15.8, SD 4.4. Thus gender had significant difference observed t=2.55, p =0.011. However, significant differences were not recognised for the experience of previous pain education ($P > 0.05$). This study concluded that Saudi nurses have limited knowledge on pain care thus the need for continuous education and review of nursing undergraduate curricula.

Likewise, Liza, Winnie and Daniel (2008) did a study on the level of nurses' skills, knowledge and attitude on pain management in Nigeria. Liza, Winnie and Daniel (2008) found a deficit of knowledge and positive attitudes among nurses as a challenging factor in cancer pain management. This study revealed that nurses' knowledge on cancer pain management was ranging 20 -76% with a mean score of 47.7% and Nurses more extended period of experience in the clinical area had better knowledge than those who had a shorter period in clinical practice. Liza, Winnie and Daniel (2008) study concluded that nurses had advanced suitable attitudes towards cancer pain management. However there exist contradictions between practice and attitudes.

Yildirim (2008) carried out a study in Turkey to assess knowledge and attitude in cancer pain management among nurses. This study was done in two different hospitals with participants of 68 nurses at the oncology unit using Nurses Knowledge and Attitudes Survey Regarding Pain (NKARSP) tool. This tool contained true and false 22 items; multiple-choice questions were 13 questions and two case studies with two questions each. The finding of this study reported that nurses had knowledge deficit and poor attitude towards cancer pain management

Alshahwan and Samarkandi (2017) study intended to assess understanding and attitudes toward cancer pain management of Jordanian nurses working in oncology units. The study was a cross-sectional descriptive design with a sample size of 135 nurses who were working at four oncology units. Knowledge and Attitudes Survey data regarding pain was gathered, and 51.5% of nurse's respondents provided correct answers, and that revealed they had the fair knowledge and positive attitudes toward cancer pain management. Nurses in this study demonstrated knowledgeable about cancer pain management guidelines but were ignorant on pharmacological approaches to cancer pain management and had negative attitudes toward opioids addiction and pain assessment. This study also noted that knowledge and attitudes were higher among nurses who had earlier education programs ($P < .001$) and operated in a pain team ($P < .001$). Alshahwan and Samarkandi (2017) recommended the need for integrating cancer pain management topics in the nursing curricula for necessary training as well as in postgraduate educational programs. This study also suggested the need to set up pain management teams and utilisation of cancer pain management guidelines that will enhance operational treatment of cancer pain.

Malloy et al., (2016) published a paper on the needs of palliative care for cancer patients in Kenya through encouraging nursing education, persuading and improved health-care policy. Malloy et al., (2016) argued that nurses are primary health care providers in Kenya and provide education to the community regarding cancer and palliative care. Nurses also assess and manage cancer symptoms such as pain in the clinic, inpatient settings, and even more so in rural and remote communities. Many nurses work in remote areas and provide this care alone. Thus, there is a need to encourage nursing education, research, advocacy and leadership in Kenya to promote excellent palliative care for the extremely ill patients. On the other continuum, Ali (2015) wrote an article on limited

palliative care services that are only provided to merely 10% of those who need the service. Ali (2015) article further explained that there is the limited training for health professionals in pain assessment and management in Kenya. In addition, there are numerous challenges facing health worker or nurses in pain management, such as strict policies in Kenya for opioid use and fear of prescribing opioids to relieve pain due to its addiction effect or due to litigation

2.3.8.3 Patients' Perception in Pain Management

Fallon et al., (2006) article on principles of control of pain, suggests that physically damaged of pain and human emotional processing of such information is entwined in the nervous system. Thus, patients' perceptions' like sleeplessness, anxiety and fear that are perceived in the limbic system and cortex influences how an individual perceives pain. Hence, uncontrolled pain experience results in mood disturbances, and when pain is, controlled mood improves. Fallon et al., (2006) article conclude that over 80% of cancer pain can be controlled considering patients' perception as their assessor, utilising current assessment and organised approach of analgesics choice using the WHO- three-step analgesic ladder.

Lydia and Dlitt (2015) study on experiences of pain among postoperative patients in Ghanaian Surgical hospitals using ethnographic exploration found emerging themes that include the fact that pain is subjective. Pain has been labelled in different magnitudes and communication, and psycho-sociocultural factors influence the pain experienced by the individual. Health system available, personnel attitudes of health workers, patients and health financing aspect have implications for pain experienced by patients**.** Mulemi (2008) did a study on 42 hospitalised cancer patients in an oncology unit in Kenya to explore their experiences of cancer disease. Collection of data was through observation

and informal conversations with an in-depth interview with patients and hospital staff for one year.

Mulemi (2008) revealed that cancer patients expected to recover even though they experienced delayed referrals, long periods of suffering from pain, late diagnosis and treatment. This study also found that patients' perception of their terminal illness of cancer is far from reality because they play a passive role in their care are placed in low hierarchy position in the hospital due to their lack of medical knowledge. Cancer patients perceive that entrance to more medical technology such as National Hospital with high competences staff will enhance their cure and relief their pain. Thus, Mulemi study concludes that cancer patients play a passive role in their cancer pain management, though pain relief can be a subjective experience.

Fahey and Miaskowski (2008) study of an intensive literature review aimed to examine a complex coaching intervention to assist patients with cancer pain to discover beliefs and attitudinal barriers that interfere with pain management. Patients were instructed to explore their beliefs about pain, about communications on pain management, and the utilisation of pharmacological and non-pharmacologic interventions. This study concluded that training patients to explore beliefs decreases ineffective behaviours and improves pain treatment adherence, thus overcomes barriers to pain management. Coaching patients' beliefs and values will also stimulate self-care management, self-efficacy, and commitment to pain management treatment plans. Thus, Models for nursing care in advanced practice require integrating such intervention into their communications with patients experiencing cancer pain.

2.3.8.4 Social-Cultural Perspective of Cancer Pain Management

WHO (2008) reports that 70%-80% of cancer patients in many developed countries use complementary and alternative medicine (CAM) such as herbs, vitamins, and minerals for cancer pain management. The use of CAM has an essential socio-cultural meaning associated with the identity of the cancer patients and assists them to make decisions regarding the use of conventional treatment.

Traditional Medicine Strategy WHO 2014-2023 was developed in response to the World Health Assembly resolution on traditional medicine. The strategy aimed to support Member States to connect their potential contribution of TM to health, wellness and people-centred health care. To promote the safe and effective use of TM by regulating, researching and integrating TM products, practitioners and practice into health systems, where appropriate. Traditional medicine (TM) or complementary alternative medicines are vital and often underestimated part of health services. Molassiotis et al., (2005) study reported the increased use of (CAM) product by 30% among cancer patients after cancer diagnosis coupled with other non-pharmaceutical like relaxation, guided imagery, hypnosis, and acupuncture. Mariana et al., (2013) revealed that patients mostly do not report the use of non-pharmaceutical therapy and CAM therapy to health professionals, perhaps, because they feel that these practices may be risky to their treatment or because many doctors do not believe in these modalities

Sharvers et al., (2010) searched published literature from 1990-2008 on ethnic and cultural patterns of pain management. Sharvers et al., (2010) defined culture as common beliefs, social norms and religious practices. Cultural attitudes and beliefs about the origin, role, and meaning of pain has an impact on the way individuals understands, interprets and responds to their pain. These attitudes and beliefs can affect how they

perceive and behave towards painful events or situation. Campbell and Edwards (2012) study on a review of literature in African American, elucidates that Culture forms various features of pain experience that include system. Culture determines where, when and how one can seek health care, practices, beliefs in illness and behaviours. This study also highlighted Substantial documents that exist on discrepancies to the prevalence, treatment, advancement and outcomes of pain-related conditions.

Booker (2016) study on Electronic database searched from various sources, and a manual search of reference identified 41 relevant articles focusing on perceptions of pain and pain management. The study aimed to explore the perceptions of acute, persistent, and disease-specific pain and treatment options held by adult African Americans (AAs) and determine social-cultural influence on cancer pain management. For select African Americans (AAs), having cancer pain meant having limitations that the body is not working, as it should, a sign of worsening cancer, or that a severe problem is impending. Common pain descriptors used by AAs include aching, tiring, exhausting, sharp, stabbing, tender, throbbing, and nagging. Among AAs, Stoicism was a standard style of coping with cancer pain. AAs stigmatise both cancer and pain. Thus they tend to avoid talking about pain because they believe that right patients should not talk or complain about pain because it makes it worse and does no good. They also believe that pain is something that one has to live with and bear. Other reasons cited for displaying stoic behaviours and attitudes were to minimise family concern and to maintain a sense of privacy. Spiritual mechanisms such as praying and hoping, faith and belief in God and positive self-talk/coping self-statements are commonly used to cope with pain among African Americans. Other coping mechanisms include music, guarding, diverting attention and minimisation of pain versus controlling the pain.

Nortje & Albertyn (2015) carried a study among South Africans Nguni and Sotho cultures in order to gain insight into the origin and management of pain. A total of 42 participants, who were on average 42 years old, were interviewed. In the Nguni culture, beliefs surrounding pain are intricately linked to communication with ancestors who are spirits who are actively involved in the world of the living. Similarly, Sotho culture holds the belief that when an ancestral spirit is angered, it can cause sickness and misfortune, which result in pain as a form of punishment. Furthermore, in both cultures children are taught to endure pain with stoicism and resilience. The use of traditional medicine to alleviate pain is also common in South Africa. For instance, Sotho group use a traditional remedy or izimbiza. Some of the more common remedies include Kgopane (to treat burns), Tholwana (a toothache), Tshikadithate (hip pain), Mokgalo (inflammation of the glands), and Seholobe (cleansing the system). In Nguni culture, some of the traditional techniques included, ukugcaba (isiZulu) where one needs to cut the painful area with a sharp object, e.g. clean razor and then apply herbs which are rubbed through the bleeding opening

Anderson and Payne (2009) study evaluated peer-reviewed articles on ethnical disparities in pain management and found that cultural disparities exist and persist in chronic cancer pain and palliative in general. Anderson et al., (2009) suggest the need for rigorous studies for developing interventions and policies for eradicating such disparities in pain management, through a different social-cultural understanding of pain.

Jeanette and Margaret (2007) study from published articles, clinical studies, testimony and conference proceedings that aimed to examine poverty and ethnicity disparity about cancer pain management, found a discrepancy in the quality of cancer pain management. The discrepancy was resulting from the relationship among patient, provider, and environment. Regardless of the cause, an inconsistency result of insufficient cancer pain

management exit for the vulnerable populations that are unacceptable in cancer care due to limited resources for treatment. Oncology nurses and interdisciplinary teams are expected to be aware of the inequalities in cancer pain management for the vulnerable groups that need interventions to empower patients through education and implement strategies to ensure adequate pain management and monitoring for vulnerable population and clinical case studies.

Bonham (2001) study explains that different societies have their cultural beliefs and practices regarding pain. Thus, there is a relation between culture, social factors on patients' behavioural pain and pain management. Berit, Finnström & Söderhamn (2006) study on Somali cultural practices, reports stoic perceptive of pain experience among Somalis. Pain is often expressed by rest or through their body language. It is considered weak to express pain verbally through crying or moaning. Cancer disease is generally masked in fear among the Somalis, and lack of knowledge in such disease is equated with death. Such psychological trauma to cancer patients will result in cancer patients feeling hopeless (Mwanda et al., 2004) inability to perform the daily activity and reduced quality of life. Somalis also have been reported to relieve pain through the use of cultural herbs, reading of the Quran, burning on the site of pain relief.

Maalim (2006) study on utilisation of nursing services by nomadic pastoralist at Garissa using participatory rural appraisal reports that Somalis have their cultural determination of the cause of pain or Xanuun. This study found that current nursing services have challenges in utilising the elaborate information network of the pastoralist community. Thus, nursing personnel need to develop a friendly relationship to understand the sociocultural dynamics of the community better. Maalim (2006) study revealed that Somalis community believe that the cause of pain or illness in three domains. They

believe that God brings any disease and when one is ill it is a way of reducing worldly sins. Thus, label illness within their cultural context. Nomadic Somali also believe that one gets ill or cancer pain or any other diseases due to witchcraft, demons that possess or Jinns, curse or evil eye that comes because of jealousy feeling towards others. They also believe in some modern scientific diagnosis like malaria which comes because of mosquito bites. Carroll et al., (2007) study on knowledge of health promotion among Somali refugees in the USA, found that Somalis do believe in the existence of cancer that is most feared and associated with death. Cancer diseases are masked in fear, and lack of knowledge in such disease is equated with death. While there is a stigma that is associated with the diagnosis of cancer, the Somalis have a communal emotional attachment to each other. Majority of Somalis believe the treatment of cancer pain or any other pain is the citation of the whole Quran to the patients.

National Cancer Institute (2014) documents acupuncture as a form of traditional Chinese medicine to manage cancer pain. Acupuncture is a procedure that involves inserting very thin, metal needles into the skin at certain points of the body. The goal is to change the body's energy flow so that it can heal itself. Acupuncture has also been shown to help with nausea and vomiting related to cancer treatment (In Chinese medicine, Pain means it is not smooth and smooth means there is no pain). Acupuncture has widely been practised as one of non-pharmaceutical approach in cancer pain management. However, Paley et al., (2015) did study on a restricted search where subjects were randomly allocated to the method under testing. This study was on electronic medical databases of up to July 2015, factoring in various studies written in any language, focusing on adult treatment with acupuncture therapy for cancer pain in comparison to no treatment, or usual patient treatment, or any other method of treatment. Five studies were found to compare acupuncture against either sham acupuncture or pain-killing medicines with a

total of participants of 285 persons. These studies had small sample sizes reducing the quality of their evidence and not big enough to give reliable results. Paley et al., (2015) study concluded that there is insufficient evidence to prove the effectiveness of acupuncture as a method of pain management.

Similarly, Huang (2013) carried out a study on semi-standardised acupuncture treatment, comprising of one to three treatment sessions of 20–30 minutes per session, per week for eight weeks. The European Organization for Research and Treatment of Cancer Quality of Life Questionnaire (EORTC QLQ-C3) and a visual analogue scale (VAS) for pain rating were used as an outcome measures to assess pain and Quality for Life. The percentage of improvement ranged between 18% and 95% using VAS, with a decreased score from 51 mm to 36 mm at the end of week 8 and to 23 mm at the end of week 12. The overall Quality of life improvement ranged between 20% and 100%. Patients had a mean raw score that improved with time, with increased baseline score from 55 to 69 at the end of treatment of 8weeks and to 73on follow-up for 12weks.

Another ancient Chinese method of healing is the practice of Qigong. Klein (2017) defines Qigong as the use of all skills of mind-body exercises that incorporate breathing adjustment, body adjustment and mind adjustment. It is a spiritual healing and ancient practice of manipulating energy through slow body movements and meditation, with or without imagery, and breathing techniques. The purpose of qigong is to open blocked energy channels and facilitate. Klein (2017) study on a review of scholarly texts, Internet and PubMed search, field observations, and expert opinion., suggest that consistent practice of Qigong exercise therapy has the possibility of improving cancer-related Quality of life and is indirectly associated to cancer prevention and survival. On the other continuum, Ernst (2007) carried out a study on summarised and critically evaluated

published literature on the effectiveness of qigong use as a stand-alone or additional therapy in cancer care. Lee et al., (2007) study conclude that the effectiveness of qigong in cancer pain care is not yet well supported by evidence from rigorous clinical trials.

Muhamad and Krauss (2015) study suggest that Islamic healing is commonly mentioned as the treatment of choice by many Muslim cancer patients because of their family and friends influence. Islamic healing beliefs and perceived is preferred due to the incompetence and discontent with conventional treatments. Islamic healings remain to be common complementary cancer treatment in Malaysia due to strong cultural and religious beliefs. The healing mode most cancer patents mentioned is a recitation of some verses of the Quran by a sheikh or Islamic healers. Their religions and cultural beliefs influence cancer patients' decision making of their healing preferences and pain control.

Suhami et al., (2015) explain the of two main approaches that form the Islamic healing practice. One is the Recitation or reading of Quran verses as the primary method plus voluntary reading of du'a and sunnah salat. It also includes the combination of reading du'a, recitation of some verses of Quran, use of healing water, with the use of herbs. The Islamic healing pursues to assist patient's health in both spiritual and physical need. Despite the advances in the modern treatment of cancer, Islamic healing continues to be accepted by cancer patients in Malaysia. Quran is a primary source of Islamic teaching and is perceived as a form of healing, smoothening and reducing cancer pain

According to Cancer Research UK (2015) document, Hypnosis is like many other types of complementary therapy, and cancer patients use hypnotherapy to support them to relax and cope with symptoms and treatment. Hypnosis or Hypnotherapy use will enhance an individual to feel more comfortable and control of their situation. Hypnosis is a trance-like state of relaxed and focused attention. In this relaxed state, people's minds are usually more receptive or open to suggestion. As a result, hypnosis can be used to block the

awareness of pain or to help change the sensation of pain to a more pleasant one Thus; there is some evidence that hypnotherapy helps to control symptoms such as depression, anxiety, stress and pain. National Cancer Institute (2014) states that an assessment panel from National Institutes of Health (NIH) Technology that found strong evidence for the use of hypnosis in decreasing pain, including that associated with cancer. Pain reduction is thought to occur through cognitive distraction, muscle relaxation, and alteration of perceptions. Ferrell (2011) agreed that Hypnosis and imagery appear to be beneficial for acute procedural pain and have been found to benefit women before breast biopsy. Massage may help reduce pain and anxiety. National Cancer Institute (2014) document explains the use of pressing, rubbing, and kneading parts of the body with hands or specialised tools will reduce pain. For pain, a steady, circular motion near the pain site may work best Therapeutic massage dates back thousands of years to ancient cultures of China, Japan, and India and a review of several studies reported decreased pain and relaxation in male patients with cancer following a massage intervention. In addition, according to the National Cancer Institute (2014) reports distraction and imagery are methods used to cope with pain distraction which is merely turning your focus to something other than the pain. It may be used alone to manage mild pain, or used with medicines to help with acute pain, such as pain related to procedures or tests. For instance, watching television and listening to music are examples of good ways to distract the mind. Imagery is like daydreaming. It involves the closing of eyes and creating images in one's mind to help relax, feel less anxious, and sleeps. For example, one may want to think of a place or activity that made him/her happy in the past and explore this scene, which could help reduce pain.

British Pain Society (2010) document the use of imagery and relaxation pain can reduce with the use of imagery. Thus, engaging in such activities as guided imagery can reduce

awareness of pain. Relaxation will reduce pain or keeps it from getting worse by getting rid of the tension in your muscles. It may help with sleep and give one more energy Relaxation techniques have the potential to increase well-being and thus may contribute to controlling pain. Subsequently, there is Biofeedback approach for pain control. According to the National Cancer Institute (2014) outline biofeedback as the uses machines to teach you how to control specific body functions, such as heart rate, breathing, and muscle tension. Learning how to control them may help one relax and cope with pain

2.4 Nursing models

Nursing models describe, explore and represent reality or merely organise a complex phenomenon. Nursing models consist of is both concepts and the assumption that combine them into a meaningful arrangement. Florence Nightingale was the founder of the modern nursing profession, and she was the first nurse theorist. Since then nursing models has progressively involved so as enhance nursing knowledge district from medicine. Nightingale viewed nursing professional from the spiritual philosophical perspective and God's law of healing patients from illness. Nightingale emphasised nursing profession as searching for the truth in healthcare issues and thus developed an environmental theory with five components. Such components are proper ventilation, warmth, light, quiet environment and adequate nutrition. She believed that environment has a significant influence on patients' outcome and external influences can prevent, suppress or contribute to disease or death. This theory cannot be used in cancer pain management because it not only environmental factors that can control cancer pain because pain is complex and subjective. Thus patient perception needs to be considered.

Another theorist known as Hildegard Peplau developed interpersonal relations- model. According to Hildegard Peplau's theory of 1952, there is an interactive process between individual client and nurse. This theory is based on the psychodynamic perspective of nursing. By understanding one's behavior to help others identify their difficulties. Thus the nursing care is an interpersonal and therapeutic relationship with a client who has felt the need. According to Peplau, health means forward movement of the personality and human processes toward creative, constructive, productive, personal, and community living. This theory cannot be used in cancer pain management since psychodynamic perspective only cannot control pain because there is an aspect analgesic use for pain care

Sister Calista Roy is also a nurse theorist (Mackenna, 2005) well known for adaptation theory that considers holistic perspective and concept of systems for patients' care. Calista Roy model of care outlines five modes of interrelated essential elements. The first element is *Patient* who is the person receiving care; second is the *goal of nursing* that aims for adapting to change, thirdly is *health* which means being and becoming a whole person, fourthly is an *environment* where the person operates and finally, nursing *activities* which are directed to facilitate adaptation (Mackenna, 2005).

Roy Adaptation Model (RAM) developed by Calista Roy is applicable in this study. This model assumes that cancer patients are open system who response to stimuli from inside and outside environment. Afterwards, they develop control system before appraising the adaptive process to cancer symptoms that include pain (Weru et al., 2008). Cancer patients, however, require four adaptive modes during this control system. According to (Bilal et al., 2014) these control systems consist of *physiological* (origin & cause of the pain, availability of treatment/ therapy), *self-concept* (pain intensity measure &stage of

cancer), *Role function* (social-cultural factors, age, gender, belief about pain) and *interdependence* (psychological therapy, love, emotional and respect of patient's pain). Thus, cancer patients will respond to these modes via either adaptation process or maladaptation. The adaptive responses to cancer pain may include a regulator, which is physiological, biological activities and cognator events that may array from psychological will or higher functioning to a physical attribute.

2.5 Evaluation in cancer pain management

It is essential to understand and implement principle approaches to cancer pain management using an appraise model of care. However, it is equally important to evaluate pain control. Evaluation of cancer pain management is a curial stage that requires nurses and patients to understand the components of cancer pain holistically. Effective cancer pain management can be achieved by understanding the dynamics that influence pain and evaluation of models of care. A multidisciplinary approach has been appraised ineffective cancer pain management.

According to WHO, the following nine steps offer positive outcomes of pain management as noted by (Raphael, 2010)

- Acceptable guidelines and policies focused on controlling cancer pain
- Accept and believe the patient's pain report.
- General dialogue with patient effective reporting and create rapport to overcome negative perception of the patients.
- Always evaluate pain intensity and its impact on daily activities and effectiveness of the pain medications. Thus appraise standard tool for pain assessment
- . Comprehensive history on the pain that includes the: onset, triggers, quality, severity, relieving factors, understanding/perception, and aggravating factors. Secondary data may also be used for verification.

- Assessment of the psychological and social state of the patient, i.e. the level of anxiety and depression, suicidal ideations, functional limitation and another negative impact of pain
- Physical examination to validate the history taken to determine the cause of the cancer pain which leads to appropriate management.
- Carry out necessary investigations to establish the cause of pain and continuous assessment of pain especially breakthrough pain.
- Consider other methods of pain control other analgesics such as palliative radiotherapy, patients cultural dynamics in pain management
- Evaluate the outcome of cancer pain treatment using a multidisciplinary approach.

Table 2.2: Recap of Literature Review

Study Title	**Purpose**	**Author& Time frame**	**Methodology**	**Outcomes**	**Relevant findings**
New cases of diagnoses of cancers in Garissa General Hospital-Kenya	The primary objective of the study was to analyse data of newly diagnosed cancer patients in Garissa Referral General Hospital	Hassana A, Shariff M and MohamedM (2014) *European Journal of Cancer*	All histopathological reports from January 2008 to August 2012 were studied at GCRH. Then data was analysed using SPSS package	Newly diagnosed cancer cases were on the increase every year with the most common cancer as oesophagal cancers	Cases were on the increase as 35 cases in 2008, then 40 cases in 2009, 39 cases in 2010, 45 in 2011 & 58 cases in 2012. Age affected were 20–44 years (31%) and 45–

Study Title	Purpose	Author& Time frame	Methodology	Outcomes	Relevant findings
					64 years (30%) and> 65 years (34%). male to female ratio was 3:1
Knowledge and attitudes among nurses in pain management at Hong Kong	To assess the level of nurses' knowledge and attitude in pain management at Hong Kong medical unit	Liza YY Lui, Winnie KW So and Daniel YT Fong (2008) Journal of Clinical Nursing: Pain 17(15) 2014–2021	a cross-sectional study survey method of self – administered questionnaires of a sample size of 143 nurses	Nurses had advanced appropriate attitudes towards pain management however there exist discrepancies between practice and attitudes	Knowledge deficit and attitudes related to pain management that was ranging from 20 -76% and a score of 47.7%
Overcoming Barriers to Cancer Pain Management: An Institutional	pre-intervention findings related	Virginia Chih-Yi Sun etal., (2009) J Pain Symptom Manage. Author	prospective, Longitudinal clinical trial. Questionnaires were used to rate the quality of	Patients' barriers to pain management were reported as attitudes and knowledge regarding	Numerous factors that hinder pain management such as professional& system-related

Study Title	Purpose	Author& Time frame	Methodology	Outcomes	Relevant findings
Change Model	to barriers to pain management	manuscript; available in PMC 2009 September 21.	life & overall barriers to pain management	addiction, tolerance of pain medication by the health professional	barriers & lack of supportive care referrals system
Principles of control of cancer pain	To explain Pain physical injury pathways interlink with our emotional processing of information Cortex,	Fallon M, Hanks G, and Cherny N (2006) openaccess@ed.ac.uk Retrieved date: 21. Feb. 2016	Systematic literature review.	Uncontrolled cancer pain results in mood disturbances to improve patients' moods calls for utilisation of WHO three-step analgesic ladder.	Most common opioid for severe cancer pain is Morphine considering patients moods and perception of pain
Prevalence and management of cancer pain in ambulatory patients at Kenyatta National Hospital.	To determine the prevalence of cancer pain among patients attending oncology	Ndegwa, J. (2013) et al., Retrieved November 1, 2014, from http://erepository.uonbi.ac.ke/handle/11295/62864.	BPI questionnaires to assess the cancer pain presence, severity and management of 520 ambulatory patients in the oncology unit.	Moderate to severe cancer pain is very common. Most patients were diagnosed in the stage of cancer and where the pain	Prevalence of cancer pain to was 38.5%. over 65% of outpatient had inadequate pain management, 47% of these

Study Title	Purpose	Author& Time frame	Methodology	Outcomes	Relevant findings
	clinic of KNH			was poorly managed.	patients were on non-opioid, 13% were not on any analgesics, and only 10% were on strong opioid such as morphine
Prevalence and Correlates of Pain and Pain Treatment in a Western Kenya Referral Hospital	Assessment of levels of pain and treatment of the same in 400 hospitalised patient in a national referral hospital in Western Kenya.	Huang et al., (2013) *Journal of Palliative Medicine, 16*(10). Volume 16, Number 10, 2013	Kiswahili versions face-validated tools using both the Numerical Rating Scale and the Faces Pain Scale-Revised. Pain management index (PMI) scores were calculated	Majority of hospitalised patients in Kenya experience pain and their pain is mostly untreated	30% of Patients reported moderate to severe pain. 66% of patients had undertreated pain that is negative scores on the PMI
Participatory rural appraisal techniques in	Application of participatory rapid rural	Maalim (2006)	Participatory rural appraisal (PRA) technique	For practical and efficient health services the nursing	Diagrammatically the nomads describe their

Study Title	Purpose	Author& Time frame	Methodology	Outcomes	Relevant findings
disenfranchised communities: a Kenyan case study	appraisal techniques to health needs and plan nursing services for the Nomadic Somali community of north-eastern Kenya.	*International Nursing Review* 53, 178–188		personnel need to make Understanding of the health problem of the communities, their lifestyle and their socio-cultural practices.	seasonal movements, and this can be used to plan outreach services for the community. Current nursing services have unsuccessfully utilised this information network of the nomads.
Transitional care model for cancer pain management after discharge	Determine the benefits of applying a transitional care model in the continuum of cancer pain management, on	XuanWang, Xian-CuiWu (2016) https://doi.org/10.1016/j.cnre.2016.06.003 searched on 30th September 2017	Randomized controlled trial	Improved patients' cancer pain management knowledge and analgesics compliance. Transitional model of care also	

Study Title	Purpose	Author& Time frame	Methodology	Outcomes	Relevant findings
	discharged patients from hospital.			contributed to effective communication between health workers and cancer patients which further improved their therapeutic relationship.	
Can a theory-based educational intervention change nurses' knowledge and attitudes on cancer pain management?	To determine if a theory-based educational intervention could change Registered Nurse's knowledge and attitudes to care of cancer pain	Gustafsson and Borglin(2013)	A quasi-experimental design with non-equivalent control groups.	Theory-based educational intervention has changed RNs knowledge and attitudes regarding cancer pain management	The study revealed improvement of from baseline to four weeks of intervention at a statistical significant of ($p<0.05$).

CHAPTER THREE: MATERIALS AND METHODS

3.1 Introduction

This chapter presents the methodology adopted. It illustrates the approaches used to collect data and analyse in order to answer the study objectives. It includes the study design, study area, study population sampling techniques, inclusion and exclusion criteria, ethical consideration, data collection tools and data analysis.

3.2 Research Design

This Study utilised a mixed-method design, which is both qualitative and quantitative research approaches, which is also known as triangulation. According to Creswell and Plano (2007), mix methods link the strengths and counterbalance the weaknesses of either approach. Thus, the mix method design provides powerful insight in addressing complex concerns when carrying out studies on health services interventions. Triangulation is to increase the more extensive and deep understanding of the study phenomenon. However, some authors argued that triangulation is used to increase the study accuracy, improves validity measures and increase study credibility (Hussien, 2009). This study was carried out in two phases. Phase one was a descriptive exploratory study design, where data collection approaches presented both aspects of qualitative and quantitative of research. The research was done in order to gain comprehensive and in-depth information from adult cancer patients, clinical nurses and critical informants working at GCRH. Phase one also aimed to gain accurate data from the ground in order to identify gaps in the practice of cancer pain management that will subsequently enhance the development of a particular model of care. Phase two of this study posed questions that facilitated relevant, appropriate and evidence-based nursing care model. Phase two of the study was the actual development of cancer pain management nursing care model and testing of the model from experts options. Nurse experts in model development and nurse managers'

opinion were adopted in the care model so as to ascertain the relevance and appropriateness of the model before actual implantation on the ground.

3.3 Study Area

Garissa county has an overall estimated population of 2,385,572 that is unevenly distributed in an area of 126,906 km^2 (Hassan et al. 2013). Garissa County is mostly inhabited by the pastoralist community of ethnic Somali origin. According to Kenya Commission for Revenue Allocation report (2013) Garissa County is categorised as a marginalised area in Kenya and has predominant residents that are nomadic pastoralists whose lifestyle demonstrates less health care seeking behaviour and late diagnosis of non-communicable disease. Late diagnosis is further exacerbated by the surging cases of cancer patients in the County (Hassan et al., 2013). Garissa County was the preferred area for this study because there has been an increasing trend of cancers cases and yet lacked a distinctive model of cancer pain care. This county also borders the Republic of Somalia to the East, Tana River County to the west, Lamu County to the South, Isiolo County to the North West and Wajir County to the North. It has six sub-counties which include Fafi, Garissa township, Ijara, Lagdera Balambala and Dadaab (Appendix 7).

This study was carried out in GCRH which is situated in the central location of Garissa County, 1km away from the town centre and approximately 400kms from Nairobi. GCRH offers inpatient and outpatient services with an inpatient capacity of 212 beds. GCRH is categorised as level five (5) in the Ministry of Health norms and standard for health services delivery. In addition, it is a training facility for health workers who function at the primary care level (Garissa strategic plan 2017).

3.4 Study Population

Sampling is carried out whenever the study population is large and economic constraints make it a logistical challenge to collect the entire data. However, where the study population is small, then a census survey is carried out (Kothari, 2004). The study population included all patients diagnosed with cancers because cancer pain directly affects them. The study population also included the clinical care nurses who provide direct care to the cancer patients and nurse managers who make orders for pain medications in the wards. Other health workers like medical doctors, clinical officers and pharmacists and hospital procurement officers were also recruited in the study as key informants. Medical doctors and clinical officers were seen as significant because they determine the prescription of pain medications. Pharmacists store and supply pain medication to the wards and procurement officers make a hospital order of pain medications from the national level and are part of the pain medication supply chain. Thus it was essential to assess their understanding and ascertain the availability of pain medication in the institution. All clinical nurses working at GCRH available during the study were recruited to participate in the study. They participated because they practice the departmental rotational nature of working and thus at given time a clinical nurse will take care of a cancer patient in the medical-surgical wards. The Nursing Council Retention Database in 2016 revealed that 124 nurses are working at GCRH. However, only 84clinical nurses managed to participate in this study. A preliminary study carried out showed that there is at least an average admission of 6 patients newly diagnosed at GCRH per month in 2016 and palliative clinic register reflected at least ten newly diagnosed cancer patients at GCRH in every month.

3.5 Sampling

3.5.1 Sample size determination of nurses

This study intended to use Yamane's formula of 1967 cited in Glenn (2013) for calculation of sample size. According to Glenn, (2013) the desired level of accuracy was set to a confidence level of 95% and an absolute precision (relative margin of error) of 5%. The population proportion was set conservatively to 0.05.

The total study population of nurses is equal to (N) 124(clinical nurses and nurse managers)

$$n = \frac{N}{1+N(e^2)} \text{ and } n = \frac{124}{1+124(0.05\times0.05)} =$$

$$The\ desired\ \ sample\ size\ is\ equal\ to\ 95\ plus\ 10\%\ for\ non\ respondents = \mathbf{105}$$

Where:

n = desired sample size (95)

N = Total population (124)

e = Margin of error (0.05)

Table 3.1: Departments Sample Computations of Nurses

Name of department	Number of staffs	Proportionate sampling	Desired sample
Medical& Surgical wards	35(Clinical nurses)	35x95 124	24
Pediatric	30(Clinical nurses)	30x95 124	10
Maternity,gyneolcology &newborn	22(Clinical nurses)	24x95 124	17
Outpatient & special clinics	20(Clinical nurses)	20x95 124	30
Nurses incharges	7(nurse managers)	5x95 124	5

3.5.2 Sample size determination of cancer patients

This study refers to Hassan et al.,.(2013) study when determining sample size calculation of cancer patients. Hassan et al.,.(2013) analysed all available histopathological reports of newly diagnosed cancer patients at Garissa County Referral Hospital from January 2008 to August 2012 and reported the increasing trends of cancer cases on every year. Hassan et al.,. (2013) reported that in 2008 there were 35 cases, 40 cases in 2009, 39cases in 2010, 45cases in 2011 and 58 cases in 2012, thus atotal of 217 cancer patients**.**

The total study population of cancer patients is equal to 217(N)

$n = \frac{N}{1+N(e^2)}$ and $n = \frac{217}{1+217(0.05\times0.05)} =$

$The\ desired\ \ sample\ size\ is\ equal\ to\ 140\ plus\ 10\%\ for\ non\ respondents = \mathbf{154}$

Where:

n = desired sample size (140)

N = Total population (217)

e = Margin of error (0.05)

3.5.3 Sampling Techniques

Phase one: Various sampling procedure were employed to recruit the respondents in phase on this study. Patients in all adult wards and outpatient clinics in the hospital were purposely picked. Snowball and retrospective purposive filing sampling were carried out to identify respondents with the same condition who could be reached within the community and are on follow up from the palliative clinic. The desired sample was calculated using Yamane's formula of 1967 cited in Glenn (2013) to get the number of respondents required and Hsaan et al,. 2013 population data was utilized. Any cancet al.tients who meet the criteriautilisedministered with MBPI questionnaire.

A list of all nurses was accessed from the nursing officer in charge of the hospital and divided according to departments. Nurses on the duty roaster were stratified according to departments and were randomly selected. The desired sample was calculated using Yamane's formula of 1967 cited in Glenn (2013) to get the number of respondents required. Simple random sampling technique was applied to get the respondents in each department since they were a homogenous population. Respondents in each department were given pieces of paper with 'Yes' or 'No' to pick randomly, and those who picked 'yes' participated in the study. The exercise continued every day until the desired sample size was attained.

The other health workers such as Doctors, Clinical officers, pharmacists and procurement officers were invited into the study as key informants. Purposive sampling technique was

applied to get the Key Informants who represented a small population. However, our main targeted study populations were nurses and cancer patients to develop a nursing care model for cancer pain management.

3.5.4 Recruitment strategy

Phase one: This study recruited 94 adult cancer patients who meet the study selection criteria to provide information on their experience pain, their strategy of pain management and their challenges of the same. The study also recruited 84 clinical nurses who are giving direct care to cancer patients. Clinical nurses were invited to give information on their knowledge, practice and availability of pain medication for a cancer patient.

This study also managed to recruit critical informants that included four Nurse Managers, five medical doctors, three Pharmacists and two procurement officers as KI, who are working in the chain of pain medication. KI was administered with questionnaires to ascertain their understanding of cancer pain management and the availability of pain medication in the hospital.

Phase two: From the results of phase one of this study, a contextual 'Xannun' nursing care model was developed. Before original implementation of the model, phase two of this study was conducted. Phase two of the study invited experts on nursing care models that will give in-depth data. According to Rees (2003), qualitative study design is not a concern with sample size but rather with the depth of information gained from the participants. This study recruited five nurse managers working at GCRH and five nurse consultants from five major universities in Kenya that train nurses were selected to participate. The sampled experts' nurses were shared with a developed model of care and questionnaires to give their input and recommendation.

3.6 Selection Criteria

Phase one: The study considered cancer patients as all those diagnosed with the disease aged above 18 years who were admitted to the wards or visited the medical outpatient clinic at GCRH. The study also considered patients diagnosed with other comorbidity and also diagnosed with cancer. The other groups considered were patients diagnosed with cancer leaving within GCRH proximity that is those on follow up at the palliative clinic. Both illiterate and literate patients were included in the study. The illiterate patients were assisted by the research assistant in filling the MBPI questionnaires, although this may contribute bias in the study.

Phase one: All qualified nurses who have taken care of cancer patients or are taking care of cancer patients whether inpatient or outpatient at any given time were in allowed to participate in this study. Medical doctors, clinical officers and pharmacists and Procurement officer in charge of pain medicine were included in the study as key informants.

Phase two: Expert in nursing model development and nurse managers who can influence the use of the model developed were included in the study.

3.7 Exclusion Criteria

All patients diagnosed with other medical and surgical conditions other than cancer were excluded from this study and those with psychiatric illness too. Patients aged less than 18 years were not included in the study since they were not defined as an adult. Patients who were critically ill were also excluded. All nurses, doctors, clinical officers and pharmacists who had never taken care of cancer patients were excluded. Procurement officer not in charge of pain medicine was excluded in the study.

3.8 Ethical Considerations

This study adhered to the principles of research ethics that includes respect for persons, beneficence, justice, in-maleficence and confidentiality (Rees, 2003). This study ensured privacy and confidentiality throughout the data collection and analysis process in order to protect the rights of the respondents. Participation was voluntarily, and respondents' consent was obtained (Appendix 3). They were also informed that they had the right to leave any time they wished to discontinue from the study and this did not have any risk on the care given to them. Approval for this study was obtained from the Mount Kenya University research committee, Garissa hospital committee for research, and National Commission for Science, Technology and Innovation (NACOST)

3.9 Validity and Reliability of the Research Instrument

The validity of a data collection instrument measures the extent to which the tool can produce what it is intended to do. Reliability of the study tool provides information about the accuracy and consistency of the research tool utilised (Rees, 2003). This study ensured the validity of the data collection instruments by counterchecking the instrument with the supervisors and research experts. To enhance reliability, a pre-testing study was done before the actual data collection process, in order to minimise unforeseen or anticipated difficulties during the study.

The most important aspect of qualitative data collection and analysis is to adhere to four criteria, which include: credibility, authenticity, criticality and integrity (Polit & Beck, 2004). Focus group discussion guide was also used to gain information from cancer patients.To strengthen the validity of data collected from focus group and analysis the researcher demonstrates credibility, accountability in judging the information and providing proper findings that are faithful to reality in everyday life (Wood and Haber, 2002).

3.10 Pre-testing Study

A pre-testing study is a small-scale study carried out before the main study in its preparation. Pre-testing study was carried out at Wajir County Referral Hospital, with the same sample population characteristic as Garissa county Referral Hospital. Self-administered questionnaires were given to nurses working in medical-surgical wards and MBPI Questionnaires to cancer patients. A small sample of five nurses and five cancer patients were selected to participate in this pretest study. The pretest study is done for validation of data collection instrument (Polit et al.,2001). A pretest is an imitation and trial of the primary survey (Kothari, 2004). Pretest study provides information that guides the researcher on what may be expected during the central data collection period and enhances the data collection instrument.

3.11 Data management

3.11.1 Data collection instruments

Phase one

The study utilised the MBPI (modified Brief Pain Inventory) questionnaires to collect data from the cancer patients (refer to Appendix 5). This tool was selected because BPI has been used in many clinical studies for pain assessment and effectiveness of pain treatment. BPI was accepted in many countries and has demonstrated reliability and validity (Huang et al., 2013) even when used in different cultures and languages. However, in this study, BIP was modified to suit our context of the study and address all the study objectives. ECOG (Eastern cooperation oncology group) (refer to Appendix 8). ECOG performance status was also utilised to assess how a patient's disease was progressing. ECOG performance status is a widely used tool by researchers and physician since measures how disease can impact a patient’s daily living abilities and physical

activities (Nicolas and Silvia, 2013). A focus group discussion was carried out among cancer patients to gain more information on cancer pain management. Three sessions of the focus group were done during collection from 18/5/2017 to 17/11/2017 (appendix 6). Focus group is a particular group with the combined characteristic in its size, composition, purpose and procedure (Krueger, 1988). Focus group guide allows data collection through group interactions and discussion on a specific topic (Krueger, 1988).

Questionnaires were used to collect information from the clinical nurses regarding their knowledge and understanding of cancer pain management practice (Appendix 4). Questionnaires were also administered to the KI that included the doctors, clinical officers, nurse managers, pharmacists and procurement officers to assess their understanding on cancer pain management and establish the availability of pain medication in the hospital (Appendix 7). Questionnaires were the preferred tool in this study because they are cheap, can cover a large number of participants (Rees, 2003) and allowed the achievement of study objectives. The questionnaires in this study were prepared in line with the study objectives and targeted their specific study population. These questionnaires contained both close-ended and open-ended questions in order to obtain accurate and in-depth information from the respondents. According to Kothari (2004) questions sequence in the questionnaire need to be considered from general to specific, where relatively tricky questions will come towards the end to obtain adequate information before the end of all the questions answered.

Phase two: Emailed questionnaires were also administered to experts in nursing model development (Appendix 8). This method was convenient to gain information from Nurse Experts since they are in various universities. The questionnaire consists of both open-

ended and closed-ended questions. The input of the nurse experts was adopted in the final model development.

3.11.2 Data Collection Method

Mixed methods approach of data collection was utilised to overcome study bias (Rees, 2003). Questionnaires were utilised, and researcher trained a research assistant to help in data collection.

Phase one

Each adult cancer patient had an opportunity to participate in the study once and was administered with a questionnaire (Appendix 5). For illiterate respondents, the research assistant administered the questionnaire by interviewing them although this may have introduced bias in the study. The questionnaires that were filled by cancer patients contained three sections, the first part was on demographic information, the second part was on pain assessment, and the third part was on pain management strategies both pharmacological and non-pharmacology approaches. The approacehds get in-depth information on how cancer patients understand and manage the cancer pain they experience. Focus group discussions were done three times with cancer patients in the year 2017 at GCRH. This targeted all the adult cancer patients in GCRH to share their experiences on cancer pain management. The Focus group discussions in this study were done one session in a day and three sessions during the period of data collection which was tape recorded for authenticity. A total of 15 (5participants in each group) participants attended the face to face focus group discussion of this study, comprising of 6 men and nine females. Three sessions were conducted to get saturation.

Self-administered questionnaires were provided to clinical nurses, caring for cancer patients while they were on duty in their specific area of working to assess their knowledge and practice pain management (Appendix 4).

Self-administered questionnaires were also given to key informants in the institution that included nurse managers, doctors, pharmacists and procurement officers to ascertain their knowledge and understanding on cancer pain management and availability of pain medications at GCRH (Appendix 7).

Phase two: The activities of this phase commenced after the data analysis. The Xanuun' Nursing care model was developed was subjected to pretest in order to evaluate its content and relevance in cancer pain management. The model was labelled Xanuun because this word means pain in the Somali which also means an illness. A sample of 'Xanuun' Nursing care model with the attachment of questinnaires was submitted to nurse managers working with cancer patients and expert nurse on nursing model development in the local universities. Expert nurses and Nurses managers' recommendations and input were on the model were adopted.

3.11.3 Data Analysis and Presentation

Phase one

Quantitative Data

Quantitative research methods emphasize on objective measurement using numerical analysis and statistical application (Watkins, 2017). Data collection is through questionnaires and use computational techniques in analysis (Rees, 2003). The quantitative aspect was analysed using data of closed-ended questions of the questionnaires that were coded, filtered, entered in SPSS and analysed. The information was presented in the form of tables, charts and graphs. The demographic data were used

to carry out a comparison with the cancer patients' pain and management using correlation. Descriptive statistics were used to analyse data from questionnaires. Linear regression was used to analyse the relationship between cancer pain management and its independent and intervening variables. To analyse whether the WHO cancer pain management tool was used chi-square was utilised.

Qualitative Data

Qualitative research methods provide the researchers with more in-depth information in form of words to understand phenomenon, though analysis of the data is overwhelming tasks (Watkins, 2017). Qualitative data collection and analysis consumes a lot of time, and requires transcriptions and organizations to make meaningful information (Rees, 2003). Qualitative data collection and analysis were used in this study. Open-ended questions of the questionnaires contained answers that were of a qualitative nature. The questions was analysed by identifying similar themes and direct quotes of the participants. Similar themes were clustered. Information captured on audio tapes from focus group discussion session of cancer patients was tabulated and similar themes analysed by the thematic framework.

Qualitative data of participants' quotes was also presented to enrich the study and demonstrate the feelings and attitude of respondents (Rees, 2003). Focus group discussion data were tape-recorded for authenticity and theory developed. Though it is impossible to know how many respondents would provide data saturation in the grounded theory research (Streubert and Carpenter,1999) because theory development depends on the data generated. In this study, saturation was reached in the third session of the focus group discussion. A grounded theory approach offers clinical nursing a practicable means of generating theory about dominant psychosocial processes that are present in patient

interactions (Elliott and Lazenbatt, 2005). There is a continuous cycle of collecting data and analysing data at the same time. The researcher begins to analyse data as soon as data is gained, then compares with other sets that have been analysed (Elliott and Lazenbatt, 2005). As the research advances and categories are established, the researcher reviewed the collected data and checked whether the newly developed categories remain constant or not. This vibrant relationship between data collection, comparison and analysis enable the researcher to check if preliminary findings remain constant as new data is gained. Three focus group interviews were conducted on cancer patients during of data collection in 2017 to provide data *saturation* or level of exhaustive exploration *(*Wood and Haber, 2002). The researcher did comparisons, looking for similarities and differences of concepts and statements collected during the data collection to generate theory from the categories. The researcher adhered to the ethical principle of qualitative data collection of trustworthiness throughout the data collection period. In order to ensure validity and reliability of qualitative data collection, this study recorded actual video of the participants' activities, adhered to consistency and transparency in obtaining data, at least more than two sessions were held, and all participants were given equal opportunity during focus group discussion.

Phase two: questionnaires received via email from expert nurses and nurse managers were coded, filtered, entered in SPSS version 17 for analysis. The information was then presented in the form of tables for better understanding. Some of the nurse's input was directly adapted to the model development.

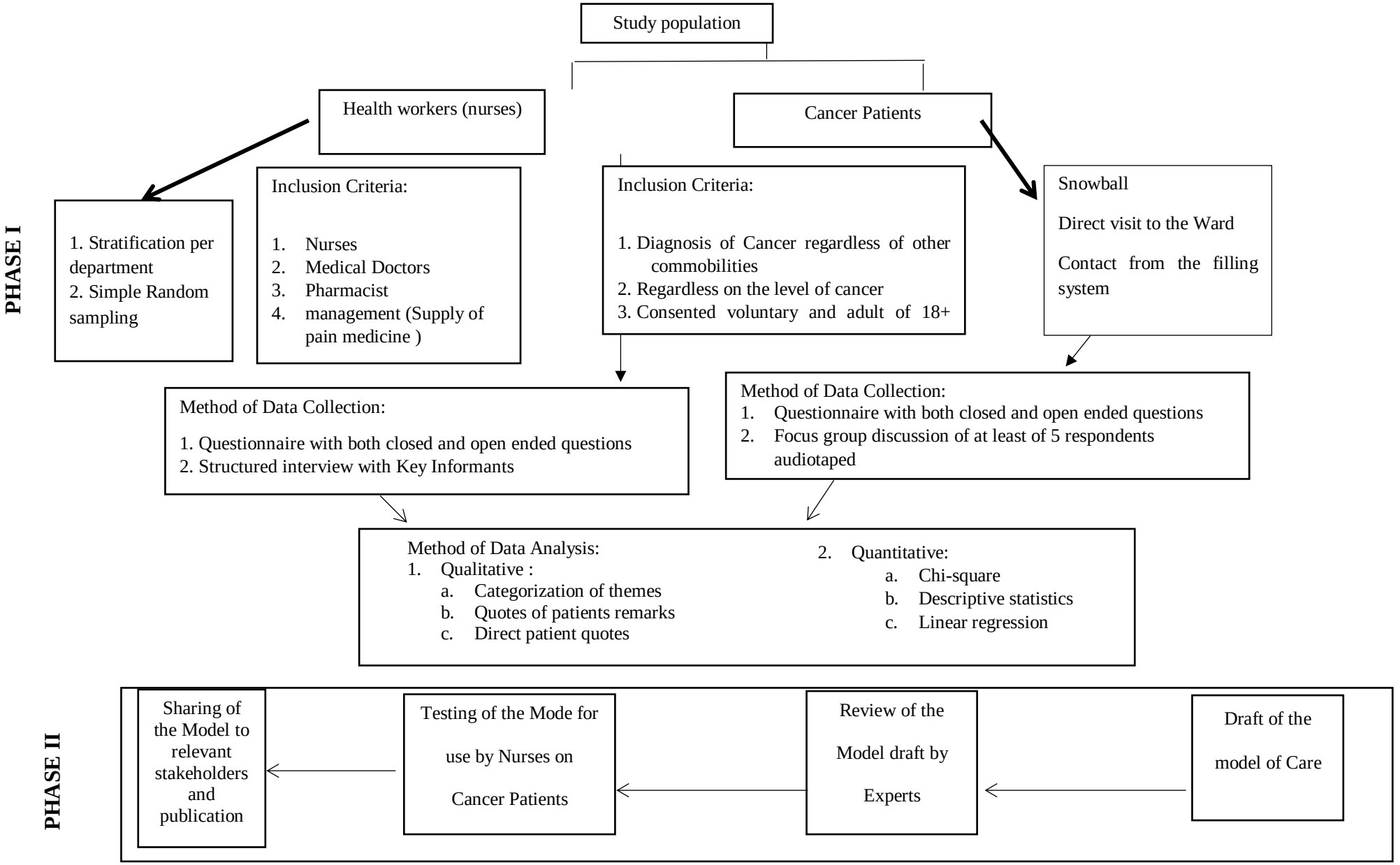


Figure 3. 1: Flow Chart showing the Sequence of the Study Methodology

CHAPTER FOUR: RESEARCH FINDING

This chapter is on study findings. It illustrates both the findings of phase one and phase two. It further explains how the model of 'Xannun' was developed and tested for relevance.

4.1 Phase One Findings

4.1.1 Introduction

The study employed the use of statistical techniques; both descriptive and inferential statistics to determine the relationship between cancer pain management and independent variables such as patients' perception, traditional pain treatment, Use of WHO - 3step ladder medication of pain relief, Non pharmacological pain control (massage, acupuncture & exercises and Psychosocial and spiritual support by use of regression analysis. The analysis was carried out using the Statistical Package for Social Scientists (SPSS) version 17.0. Descriptive statistics were presented by the use of tables, frequencies and charts.

4.1.2 Response Rate

The study had 94 cancer patients who responded on how they managed their pain and 84 clinical nurses who provide their knowledge and skill on how care cancer pains. Questionnaires were self-administered to patients and nurses at GCHR. The response rate is presented in Table 4.1 and 4.2 below.

Table 4.1: Patients Response Rate

Sample size	Frequency	Percentages
Response	94	70.67
No response	39	29.33
Total	**133**	**100**

Table 4. 2: Nurses Response Rate

Sample size	Frequency	Percentages
Response	84	63.16
No response	49	36.84
Total	**133**	**100**

4.1.3 Demographic Information of Patients and Nurses

4.1.3.1 Background Information

This section presents demographic information of the respondents who participated in research in the study. The demographic information was categorised into two parts; for patients, and; for nurses. It was essential to establish the age of patients who had cancer and currently undergoing cancer treatment in order to ascertain their perception of the cancer pain management. The study was focused on respondent patients of either gender hospitalised at the GCHR with cancer-related health complications or attending the palliative clinic. From the Table 4.1 above the patients interviewed composed of 44.7% (42) males and 55.3% (52) females. As presented in Table 4.3 below, majority 40.4% (38) of the respondents were 51-65 years in age, followed by 35-50 years with 33% (31) then above 65 years were 23.4% (22) and least below 35 years with 3.2% (4).

As the primary providers of healthcare services at the GCRH, it was imperative to understand the background of the clinical nurses at GCRH such as academic and professional qualifications, skill development as well as their work experience in cancer pain management. Majority of the nurses had a Diploma at 64.3% (54) followed certificate holders at 22.6 % (19) while only 3.6% (11) had degrees. It was essential to establish the number of years the respondents had served as a nurse in order to ascertain if they were equipped with relevant knowledge and skills in cancer pain management. The findings show that majority of clinical nurses 44 % (37) had served between 1-3 years, 36.9% (31)between 4-6 years and 14.3%(12) had served for over six years. Only 4.8% (4) less than one year. 81% (68) of them said they were not trained/ lack in-depth knowledge of cancer pain management. The summary Table 4.3 below gives the age composition of the respondents

Table 4.3: Demographic Analysis for Patients and Nurses

Patients demographic information	
Variable	**Frequency (%) n = 94**
Age	
<35 Years	4 (4.3%)
35-50Years	31 (33%)
51-65 Years	38 (40.4%)
>65 Years	21 (22.3%)
Mean Age (SD)	50.6 (0.833)
Min –Max	35 – 65
Gender	
Male	42(44.7%)
Female	52 (55.3%)
Education Level	
Primary	31 (33%)
Secondary	17 (18.1%)
Tertiary	4 (4.3%)
No formal education	42 (44.7%)
Ethnic Background	
Somali	64 (68.1%)
Non-Somali	30 (31.9%)
Income Level	
< Ksh. 23, 670	88 (93.6%)
Ksh. 23, 671 – 120, 000	4 (4.3%)
> Ksh. 120, 000	2 (2.1%)

Table 4.4: Demographic information on clinical nurses

Clinical Nurses Demographic Information	Frequency (%) N = 84
Clinical Nurses Education Level	
Certificate	19 (22.6%)
Diploma	54 (64.3%)
Higher Diploma	8 (9.5%)
Degree	3 (3.6%)
Clinical Nurses Years of Service	
< 1 Year	4 (4.8%)
1-3 Years	37 (44%)
5 Years	31 (36.9%)
< 6 Years	12 14.3)

4.1.4: Analysis of Cancer Prevalence

This study sought to establish the prevalence and type of cancer among patients. The findings revealed that at GCRH, breast Cancer was most prominent at (25%) followed by stomach cancer (24%), Oesophagus and Prostate cancer (15%), cervical and liver cancer (10%), while the remaining (1%) as summarised in Figure 4.1

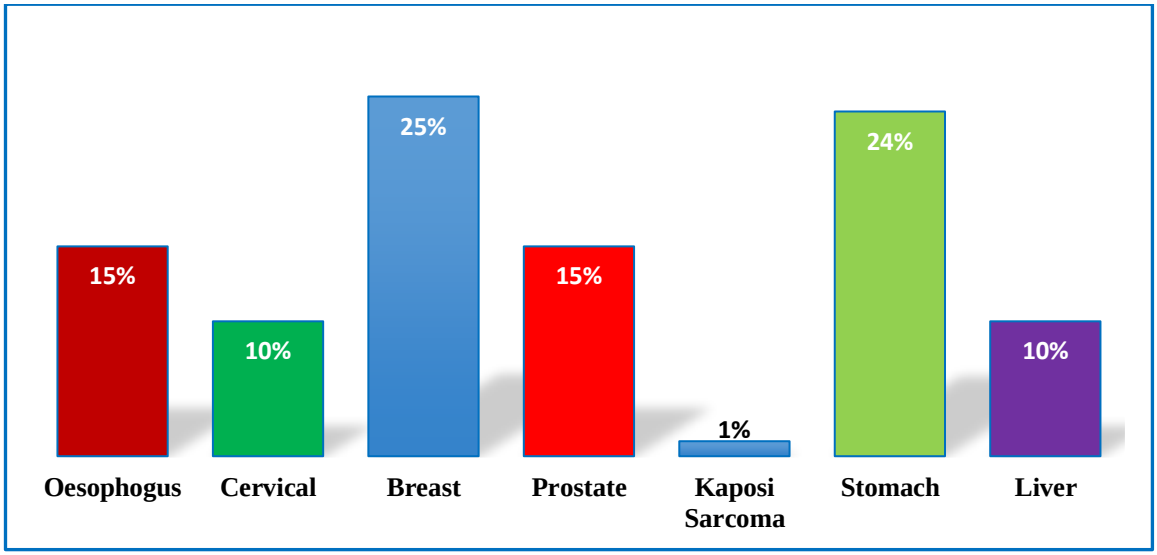


Figure 4. 1: Cancer Prevalence

On average, most cancer patients learned about their situation within less than two years, and the pain was the primary symptom at the time of the first diagnosis. Besides feeling helpless and angry at the diagnosis, most patients were worried about the wellbeing of their families since they were depended upon for livelihood.

On examining when patients were first diagnosed, (41%) indicated they were diagnosed less than six months from the time of the interview, (34%) were diagnosed 6 months to 1 year from time of the interview, (13.8%) were diagnosed 1-2 years ago, while the remaining (10.6%) were diagnosed 4 years ago. Similarly, (84%) of respondents indicated that pain was the cause of their first diagnosis indicated that pain was the first cause of their diagnosis. About (28%) of the patients had surgery in the last month preceding the interview as summarised in Table 4.5

Table 4.5: Combined Cancer Characteristics for Men and Women

Variable	Frequency (%) n = 94
Type of Cancer	
Oesophagus	14 (14.9%)
Cervical	9 (9.6%)
Breast	24 (25.5%)
Prostate	14 (14.9%)
Kaposi Sarcoma	1 (1.1%)
Stomach	23 (24.5%)
Liver	9 (9.6%)
First Diagnosis	
< 6 Month	39 (41.5%)
6 Month – 1 Year	32 (34.0%)
2 Years	13 (13.8%)
> 4 Years	10 (10.6%)
Pain as Cause of First Diagnosis	
Yes	84 (89.4%)
No	0 (0.0%)
Uncertain	10 (10.6%)
Surgery in Last One Month	
Yes	26 (27.7%)
No	68 (72.3%)

4.1.5 Prevalence of Cancer

Patients were asked whether the pain they were experiencing was due to cancer. The majority (78%) noted this to be the case, while (22%) indicated their pain was not due to medical procedures as highlighted in Figure 4.2.

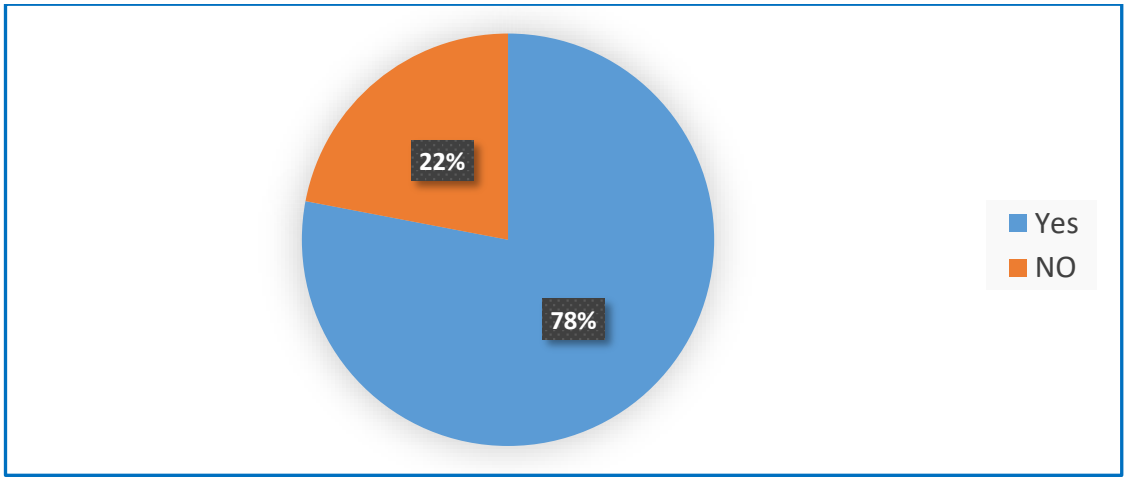


Figure 4.2: Pain Due to Cancer

Pain Management Index (PMI) was computed to analyse the intensity of pain that cancer patients undergo. It is explained to quantify how well pain is managed with pharmacological intervention. The study sorted whether pain adequately managed or inadequately managed.

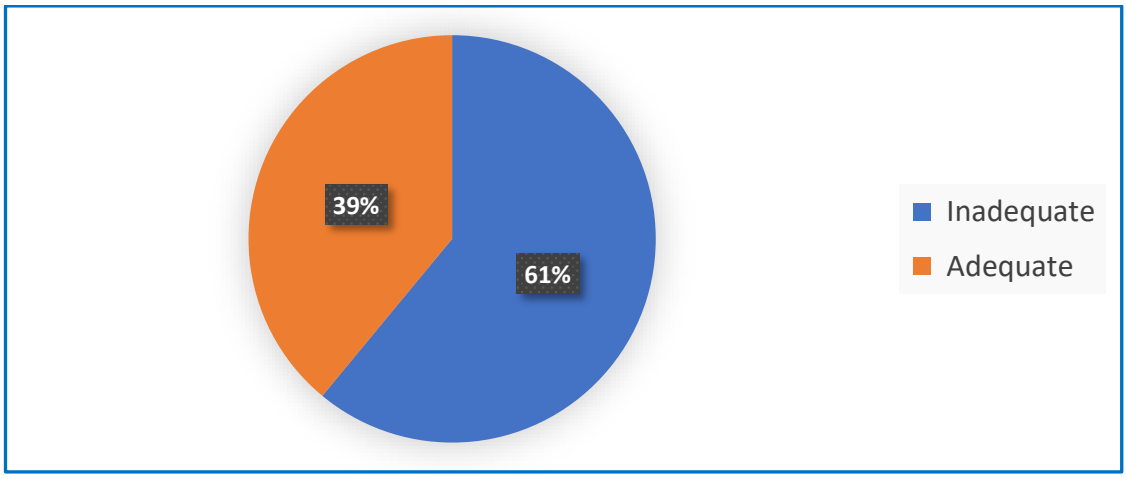


Figure 4.3: Management Index

4.1.6 Adequacy and inadequacy of Pain Management

The analysis of the adequacy of pharmacological pain management (PMI > 0); and inadequacy (PMI ≤ 0) was calculated by using the pain management index. Pain management index is a comparison of the most potent analgesic used by patients in the worst pain. For this study, the level of pain was scored as follows: level 1 for mild pain

(1-3 NRS), level 2 for moderate pain (4-6 NRS) and 3 for severe pain (7-10 NRS). The comparative level of analgesic used was graded as follows: 0 for no analgesic; 1 for non-opioids analgesic used, two was used for mild opioids, for moderate pain, while 3 for strong opioids for severe pain. The findings show that on average, (20%) of a patient of patients were on either on Nonopioids, Mild Opioid or Strong Opioid for pain management, $X2 = 16.747$; p-value < 0.05; which means that pain management index is PMI >0; and statistically significant.

Table 4. 6: Pain Management Index

Pain Management Step	Index Score by Reported Pain Level			
	None (0)	Mild Pain (1)	Moderate (2)	Severe (3)
No Analgesic Prescribed (0)	0%	0%	0%	0%
Nonopioids (I)	0%	6.9%	72.4%	20.7%
Mild Opioid (II)	0%	3.3%	66.7%	30.0%
Strong Opioid	0%	35.3%	55.9%	8.8%

Respondents were asked to rate the pain at its least and worst, and the medication they used for each level. The essence of this question was to test if patients were using the right Opioids for each pain level as prescribed by WHO analgesic ladder. The findings of this study established this not to be the case. cancer patients least pain, are supposed to be on a level I medications (Aspirin/Paracetamol/Acetaminophen, NSAD's &+Adjavants), however, the findings of this study show that at GCRH, majority of men (50%) were doing the opposite, using strongest Opioids on least pain, whereas (50%) of women were using level two Opioids for level one pain, against the WHO pain

management stipulation. Similarly, (25%) of men and (75%) of women are using the WHO level 2 medication (Codeine / Hydrocodone / Oxycodone / Dihydrocodeine/tramadol &+Adjuvants) which is a wrong medication for least pain. This finding is stipulated in Table 4.8

Table 4.7: Medication Taken by Patients for Least Pain

What Medication do you use for pain relief?			Rate Your Pain at its Least		
			Mild pain Level 1	Moderate Pain Level 2	Severe Pain Level 3
Aspirin/Paracetamol/ Acetaminophen, NSAD's &+Adjavants	Gender	Male	5 (62.5%)	5 (37.5%)	4 (57.1%)
		Female	3 (37.5%)	9 (64.3%)	3(42.9%)
Codine / Hydrocodone / Oxycodone / Dihydrocodine / tramadol &+Adjavants	Gender	Male	2 (25.0%)	8(36.4%)	11(35.5%)
		Female	6 (75.0%)	14 (63.6%)	20(64.5%)
Morphine / hydromorphone /Methadone / Levorphanol / Fentanyl / Oxycodone &+Adjavants	Gender	Male	9(50.0%)	7 (46.7%)	1(100%)
		Female	9(50.0%)	8 (53.3%)	0(0.0%)

At the worst pain, patients are supposed to be on the strongest Opioids, that is, Morphine/hydromorphone /Methadone / Levorphanol / Fentanyl / Oxycodone &+Adjavants. However, when the respondents of this study were asked to indicate their pain management at their worst, the majority were using the wrong drug level to manage pain. For instance, the findings show that (57.1%) of male respondents, and (73.3%) of female respondents who were experiencing severe pain, we're still using level 1 drug (Aspirin/Paracetamol/ Acetaminophen, NSAD's & Adjuvants) contrary to WHO level 3 pain management guidelines. Similarly, (91%) of male respondents and (70%) of female respondents were still using Codeine / Hydrocodone / Oxycodone / Dihydrocodeine / tramadol & Adjuvants, which are level 2 pain management drugs, not recommended for

severe pain management. Only (29%) of men and (12%) of women were using the right medication for the right level of pain, thus utilised medication such (Morphine/hydromorphone /Methadone / Levorphanol / Fentanyl / Oxycodone &+Adjavants for severe pain management) as indicated in Table 4.8

Table 4.8: Medication for Severe Pain Management

What Medication do you use for pain relief?			Rate your Pain at its Worst		
			Mild pain	Moderate Pain	Severe Pain
Aspirin/Paracetamol/ Acetaminophen, NSAD's &+Adjavants	Gender	Male	2 (14.3%)	4(28.6%)	8(57.1%)
		Female	0(0.0%)	4(26.7%)	11(73.3%)
Codine / Hydrocodone / Oxycodone / Dihydrocodine / tramadol &+Adjavants	Gender	Male		1(9.1%)	10(90.9%)
		Female		6(30.0%)	14(70.0%)
Morphine / hydromorphone /Methadone / Levorphanol / Fentanyl / Oxycodone &+Adjavants	Gender	Male	2(11.8%)	10(58.8%)	5(29.4%)
		Female	3(17.6%)	12(70.6%)	2(11.8%)

On the issue on how often cancer patients take medication to manage their pain, (51%) indicated they do take pain medication every three hours, (24%) indicated they do take medication twice a day, (20%) once a day, (3%) indicated more than three times a day, and (2%) did not take medication at all as indicated in Figure 4.3

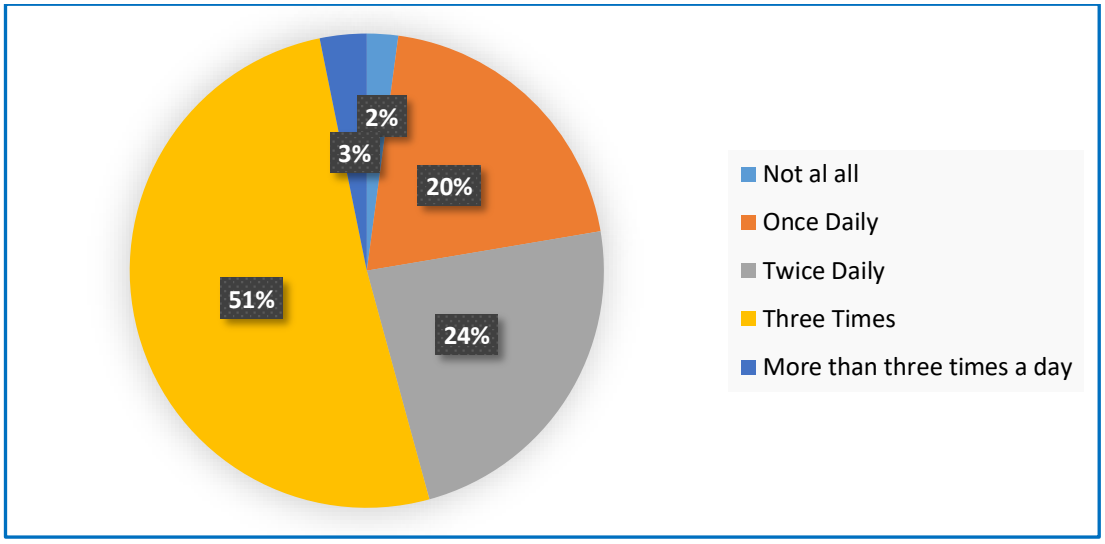


Figure 4.4: How Often Cancer Patients Take Medication

Patient was asked whether pain medication to adequately control their pain was always available, this finding on patients' response to the availability of medication is indicated as shown below

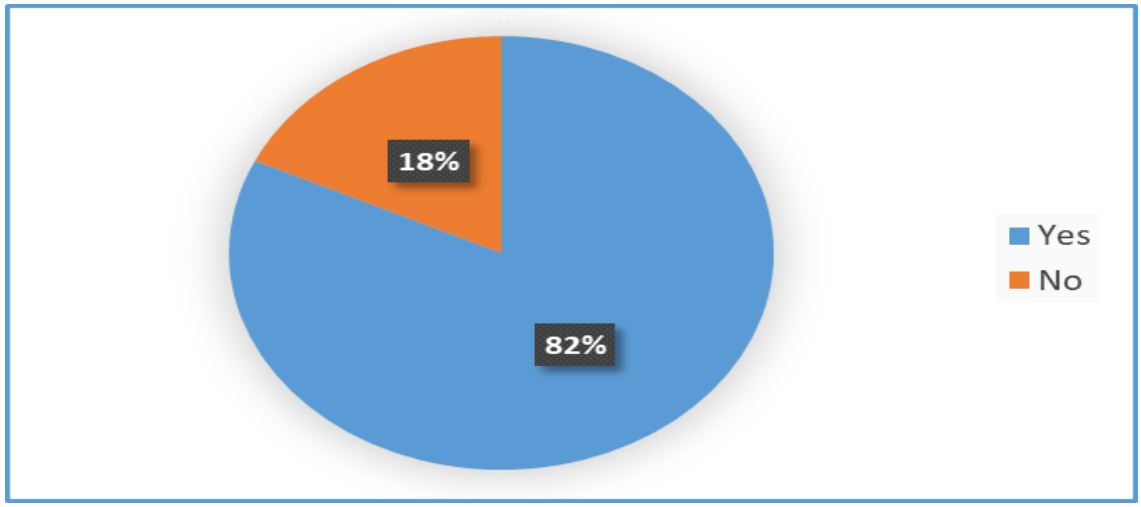


Figure 4.5: Availability of Pain Medicine in Hospitals

4.1.7: Clinical Nurses Capacity and Knowledge of Cancer Pain Management

Nurses were asked what tool they use to assess cancer patients pain, a majority 78%(66) indicated they had no tool; 6%(5) indicated they use verbal assessment, 5%(4) indicated they use numeric scale, 4%(3) use a pain scale and 7%(6) use their fingers as summarized in Figure 4.6 .

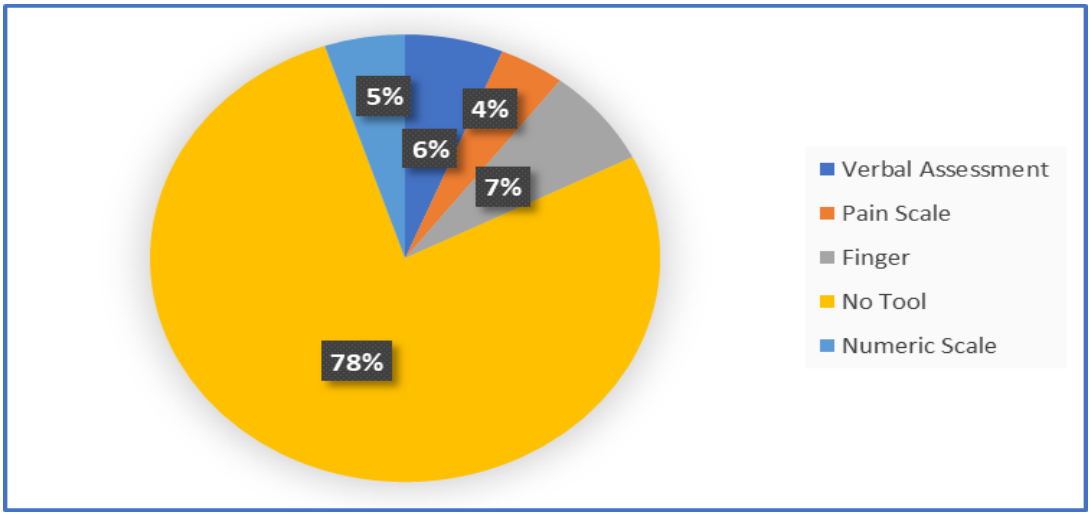


Figure 4. 6: Tool for Assessing Cancer Patients Pain

When Nurses who deal with cancer patients were asked whether they had received any short-term training in pain management, (81%) indicated they had not received such training, while (19%) noted that they had received short-term training in pain management as indicated in Figure 4.6.

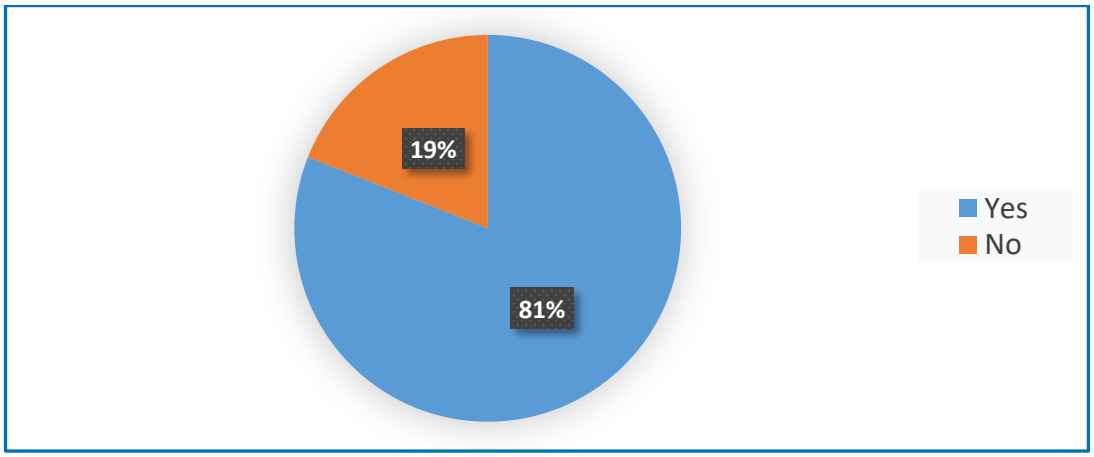


Figure 4.7: Nurses Trained on Short Pain Management Course

Nurses were asked to indict whether they had utilised WHO analgesic ladder for pain management. (83.2%) Indicated they still didn't know how to use the WHO analgesic ladder; (40%) indicated they had inadequate information on the WHO analgesic ladder, while (33.3%) had adequate knowledge of the same. As for this study finding, assessment of cancer pain lacks professional standardised assessment for proper pain management.

In addition to small standardised pain assessment tools, this study also reveals poor knowledge and awareness of nurses on the use of WHO analgesic ladder, as shown in Figure 4.8.

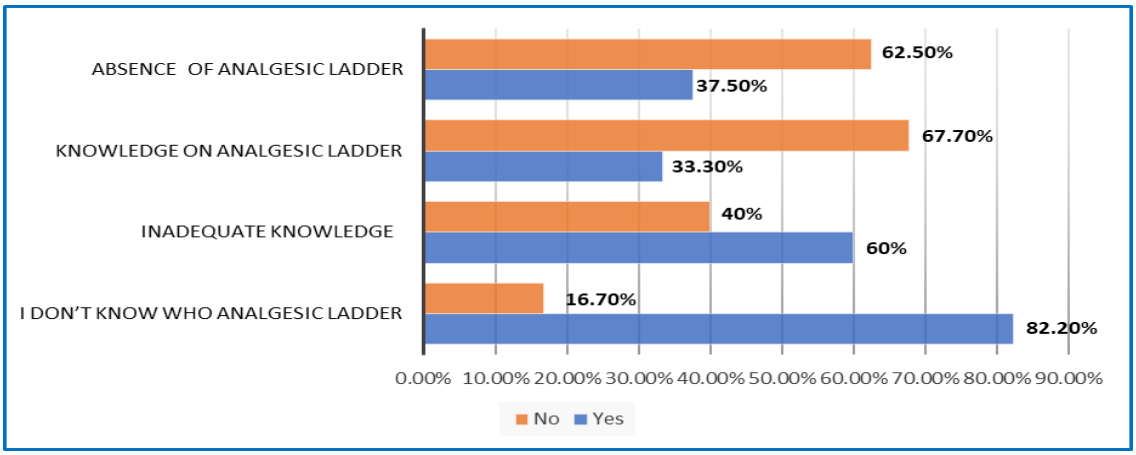


Figure 4.8: Use of WHO ladder for Pain Management

4.1.8: Key informants (Health Care Workers) on cancer pain management

This study sought to determine the level of pain care awareness and practice among other healthcare workers at the management level of the hospital. They were the key informants for this study. Fifteen health care workers included Nurse Managers who order the pain medications in wards, doctors who made the prescription of pain medication, pharmacists who stock and supply pain medication in the hospital and drug procurement officers who are part of the supply chain in pain medications from the national level. These key informants were assessed for their understanding of cancer pain and availability of pain medication in the hospital. When asked to indicate their qualification/title, 34 % (5) indicated they were Medical doctors, 33 % (4) Nurse Managers, 20% (3) were pharmacists, while the remaining 13%(2) indicated they were procurement officers indicated in Figure 4.8.

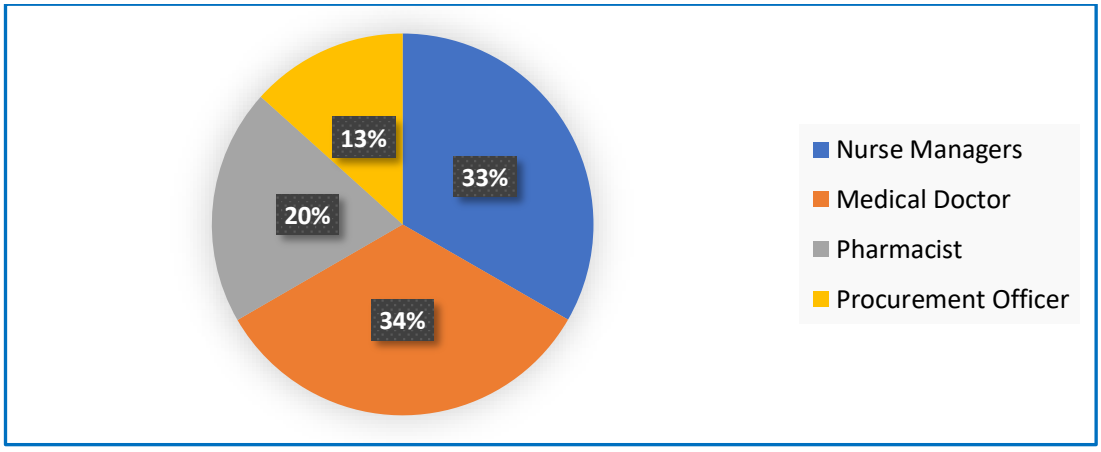


Figure 4.9: Health Care Workers Titles

4.1.8.1 Health Workers Number of Years at the GCRH

On the question on the number of years the health workers had spent at GCRH, (33%) indicated 1-3 years; (27%) had spent between 3-6 years, and more than 6 years at GCRH respectively, while the remaining (13%) has less than 1 years at GCRH as highlighted in Figure 4.9.

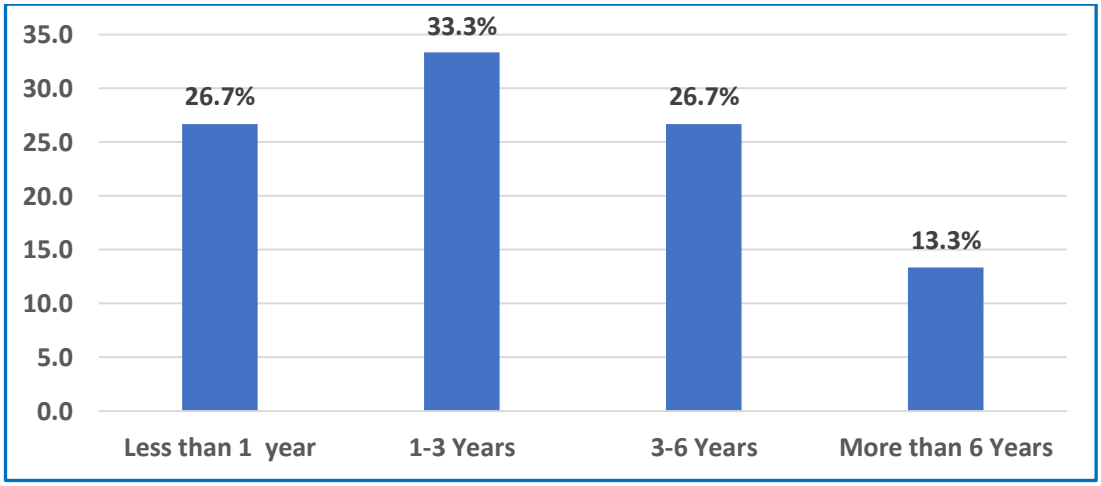


Figure 4. 10: Health Workers Number of Years at the GCRH

4.1.8.2 Health Workers Care of Cancer Patients

When respondents were asked whether they had taken care of cancer patients, (67%) indicated they had, while the remaining (33%) had not taken care of cancer patients as summarised in Figure 4.10.

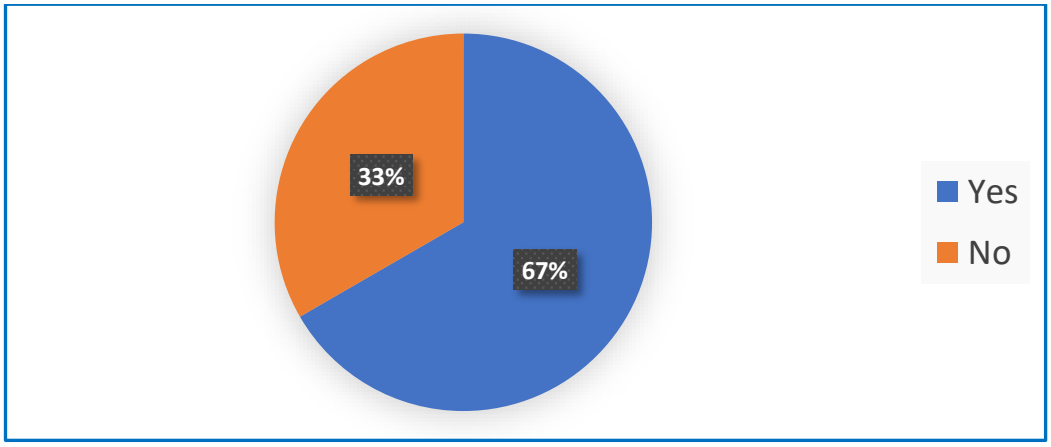


Figure 4.11: Health Workers Care of Cancer Patients

Common Cancer Mediation Available at GCRR

When the health workers were asked to indicate common cancer medication available at GCRR, all the 15 respondents indicated mostly Aspirin, Morphine, Paracetamol, Diclofenac, and Tramadol.

4.1.8.3 Awareness of WHO Pain Management Guidelines

Health care workers were asked whether they had an awareness of WHO pain management guidelines, (53%) indicated they were not aware, while (47%) indicated they were aware of the guidelines as highlighted in Figure 4.12.

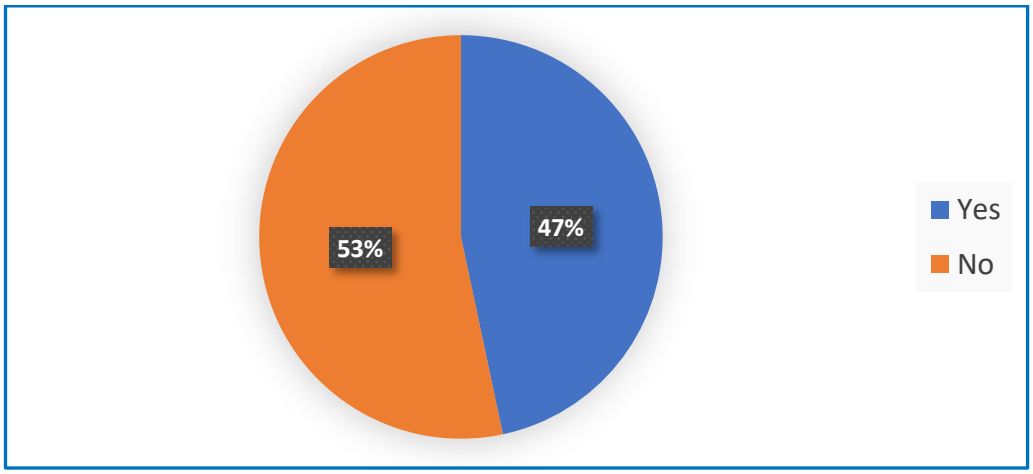


Figure 4. 12: Awareness of WHO Pain Management Guidelines

Supply of Cancer Medication

For healthcare workers who had indicated that they were aware of WHO guidelines on palliative care were asked to indicate if they have ever supplied the pain medication to patients. The majority (60%) indicated they had not supplied cancer medication, while (40%) indicated they had supplied palliative medication to patients as highlighted in Figure 4.12.

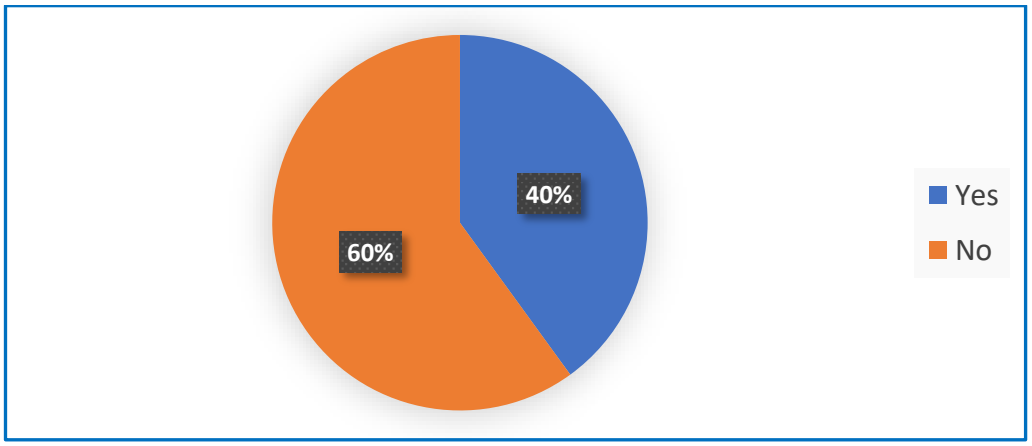


Figure 4.13: Supply of Cancer Medication

Administration of Pain Medication to Cancer Patients

This study sought to establish whether health care workers at GCRH had administered pain medication to cancer patients. The findings show that (67%) of the healthcare workers noted they had not administered cancer medication, while (33%) of healthcare workers had administered these medications as summarised in Figure 4.14

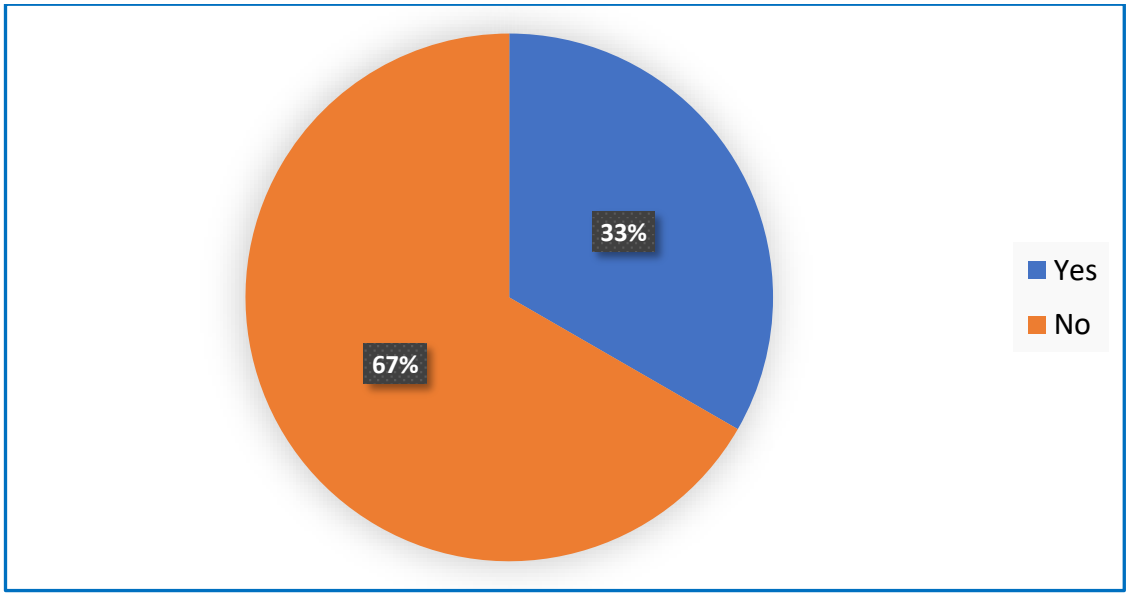


Figure 4. 14: Administration of Pain Medication to Cancer Patients

Prescription of Pain Medication

On the question of pain medication, prescription, (60%) of healthcare workers noted that they had not prescribed pain medication to patients, while (40%) noted that they had prescribed such medications as highlighted in Figure 4.15

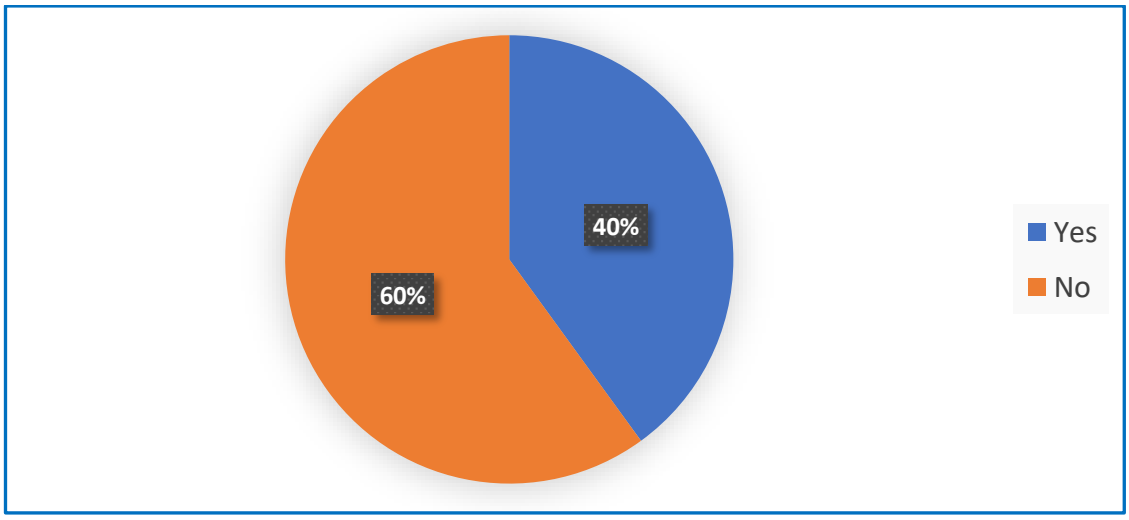


Figure 4. 15: Prescription of Pain Medication

Availability of Pain Medication at GCRH

When respondents were asked to whether pain medication of usually available at GCRH, the majority (93%) indicated that this medication is sometimes available, while (7%) indicated that this medication is never available at GCRH as summarised in Figure 4.16.

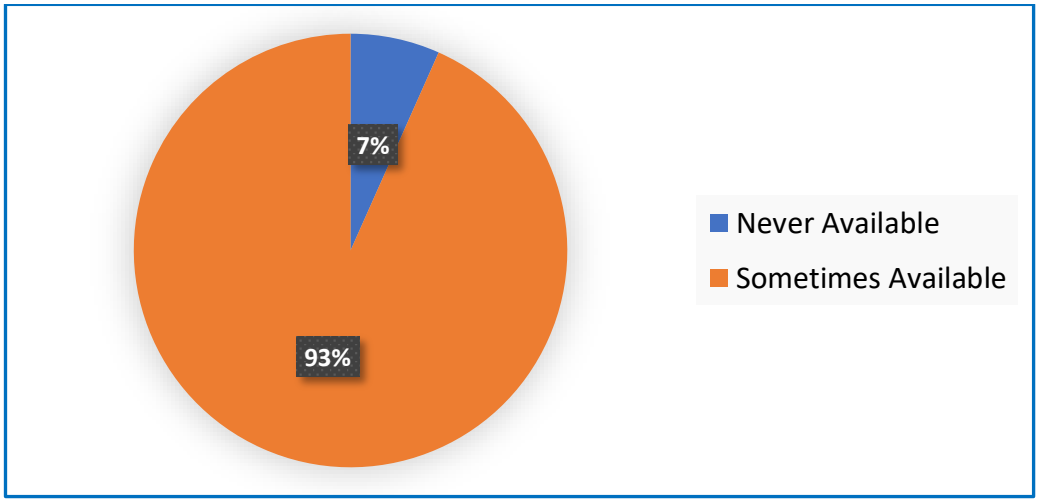


Figure 4. 16: Availability of Pain Medication at GCRH

The critical informant was questioned, together with the only palliative nurse trained at the GCRH. When asked to indicate how many clinical nurses are trained in palliative care, and working at the hospital and prescription of pain medications, she noted that she was the only trained palliative nurse:

> *"I am the only palliative trained nurse working full time at this hospital and thought I understood how to prescribe, I am is not allowed under Kenya laws, so I, therefore, write the drugs and give a doctor sign the prescription (Nurse A, KII, 2018)*

When the trained and full-time nurses were also asked as for whether pain medications are always available for the patients in line with their intensity of pain as guided by the WHO analgesic ladder? She responded that:

> *'No, the right kind of pain medication is not always available in the hospital. In most instances, the only pain medications available at GCRH include Paracetamol, Diclofenac, and Aspirin, and morphine is sometimes there' (Nurse A, KII, 2018)*

This finding shows that patients at the hospital do not have adequate medication for each level of pain in line with the WHO analgesic ladder. Most of the medications administered by the only qualified nurse are for level one pain management. Unsurprisingly, patients on level 2 and level 3 pain medications do receive inadequate pain treatment, since the medication administered are not in line with WHO ladder for their palliative pain care management.

Then again the only trained and full-time nurse at GCRH was asked whether the hospital has the equipment for screening cancer or cancer pain management, she responded:

> *"No, there is no screening equipment at the hospital to establish cancer diagnosis and also for patient's pain. Most of the patients who come for a check-up are referred to other more advanced facilities" (Nurse A, KII, 2018)*

This finding is in line with the majority of respondents (83%) who had indicated that they are not aware of the WHO analgesic ladder for pain management. However, it was noted that GCRH has one MRI machine that is used to conduct patient scanning and screening. As a requirement by the WHO on palliative care, cancer patients are required to have a special ward for their specialised treatment (oncology ward). However, the findings of this study show that GCRH did not have a special ward for cancer patients:

> *"No, we do not have a special ward, cancer patients are treated in the general ward. The general wards are only gender-segregated, but not specialised" (Nurse A, KII, 2018)*

Since GCRH had the only one trained and qualified nurse for palliative care pain management, the nurse was asked what she does when other nurses refer palliative cases to her:

> *"The first thing I do is to check their hospital history and what medication that have been taking, for the illness, and thus, being able to assess pain experienced as well as the pain symptoms. Secondly, if the cancer is in its*

first stage, or second, I refer the patients to Kenyatta National Hospital where they can get better care" (Nurse A-KII, 2018)

The analysis of how the respondent nurse would assess GCRH regarding the professionalism of nurses and doctors regarding cancer pain management indicates major challenges in the institutional structure, policies, and qualified personnel:

> *"At GCRH, there are no clear policies that guide nurses and doctors on how to deal with palliative cancer patients in pain. There are no guidelines. Additionally, hospital workers lack palliative care training and as such, don't know how to handle these patients. On the other hand, the majority of cancer patients are illiterate, which affects communication. They do not seem to understand doctors' explanations of medications (Nurse A-KII, 2018)*

4.1.9: How Cancer Pain Affects Patients Ability to Function

This study sought to establish whether the pain that patients felt interfered with their ability to do activities like walking. The findings show that among men, the majority (76.9%) noted that cancer pain completely affects their ability to walk; (85.7%) noted that they were moderately affected, (60%) were slightly affected, while (33.3%) noted that pain did not affect their ability to walk. On the other hand, (66.7%) of women respondents indicated that pain completely affects their ability to walk, (94.4%) were moderately affected while (80%) were slightly affected. The study also indicated the existence of an association between cancers and interfering with walking ability, X^2 = 6.072, df (3); however, the association was not statistically significant (p-value > 0.05) as indicated in Table 4.9

Table 4.9: Pain Interferes with Walking Ability

I feel my pain is due to cancer		Pain Interference with Walking Ability			
		Does not Affect	**Slightly Affects**	**Moderately Affects**	**Completely affects**
Male	Yes	7(33.3%)	3(60.0%)	18(85.7%)	10(76.9%)
	No	2 (66.7%)	2 (40.0%)	3 (14.3%)	3 (23.1%)
Female	Yes	1 (100.0%)	12 (80.0%)	17 (94.4%)	12 (66.7%)
	No	0 (0.0%)	3 (20.0%)	1 (5.6%)	6 (33.3%)
Chi Square Value		$X^2 = 6.072$, df (3); p value = 0.108			

This study sought to establish whether the pain that patients felt interfered with the patients' mood. The findings show that among men, the majority (80%) noted that cancer pain completely affects their mood; (66.7%) noted that they were moderately affected, while (92.3%) were slightly affected. On the other hand, (81.3%) of women respondents indicated that pain completely affects their mood, (81%) were moderately affected, while (78.6%) were slightly affected. The study also indicated the existence of an association between cancers and interfering with patients' mood, $X^2 = 2.167$, df (3); however, the association was not statistically significant (p-value > 0.05) as indicated in Table 4.1.10

Table 4.10: Pain Interfering with Patients Mood

I feel my pain is due to cancer		Pain Interference with mood			
		Does not Affect	Slightly Affects	Moderately Affects	Completely affects
Male	Yes	0 (0.0%)	12 (92.3%)	12 (66.7%)	8 (80.0%)
	No	1 (100.0%)	1 (7.7%)	6 (33.3%)	2 (20.0%)
Female	Yes	1 (100.0%)	11 (78.6%)	17 (81.0%)	13 (81.3%)
	No	0 (0.0%)	3 (21.4%)	4 (19.0%)	3 (18.8%)
Chi Square Value		X2 = 2.167, df (3); p value = 0.539			

This study also sought to establish whether the pain that patients felt interfered with their relationship with others. The findings show that among men, the majority (57.1%) noted that cancer pain completely affects their relationships; (88.9%) noted that they were moderately affected, (90%) were slightly affected, while (77.8%) noted that pain did not affect their relationship with others. On the other hand, (77.8 %) of women respondents indicated that pain completely affected their relationship with others, (85.7%) were moderately affected, (90%) were slightly affected, while (75%) were not affected. The findings also indicated the existence of an association between cancers and the pain's effect on patients' relationships, $X^2 = 3.869$, df (3); however, the association was not statistically significant (p-value > 0.05) as indicated in 4.11

Table 4. 11: Pain Affects Relationship with Others

I feel my pain is due to cancer		Pain Affects Relationship with Others			
		Does not Affect	Slightly Affects	Moderately Affects	Completely affects
Male	Yes	7 (77.8%)	9 (90.0%)	8 (88.9%)	8 (57.1%)
	No	2 (22.2%)	1 (10.0%)	1 (11.1%)	6 (23.8%)
Female	Yes	6(75.0%)	9 (90.0%)	6 (85.7%)	21 (77.8%)
	No	2 (25.0%)	1 (10.0%)	1 (14.3%)	6 (22.2%)
Chi Square Value		$X^2 = 6.072$, df (3); p value = 0.108			

When this similar question was placed to patience in FGDs, the most emerging themes on the effect of pain on their life included lack of pleasure for a living, depression, anger and mental disturbance, and a feeling of desperation and helplessness:

> *"I cannot do most basic things or enjoy simplest tasks like walking…most of the time I feel pain has taken control of my life; I feel helpless, desperate for anything to help, and when I do not see any improvement, am usually angry and depressed… I wish I could be able to go visit my friends or work the way I used to" (Participant 3, FDG 4)*

4.1.10 Cultural Influence Pain Management

This study sought to establish whether cancer patients utilised any traditional or cultural mechanisms to manage their pain. The findings show that patients relied on several mechanisms including religious practices such as reading the Quran and taking some herbal medication.

.According to the analysis of cultural factors, (77.6%) of respondents indicated that in addition to medicine, they also use the Somali herbs for healing, while (65%) or respondents use Quran in addition for the use of medication as indicated in Table 4.12

Table 4.12: Most Prominent Cultural Factors

Cultural Factor	F	%
Quran	62	65%
Somali Herbs	73	77.6%

4.1.11 Correlation of Variables

This study had four variables: on cancer pain management that include Cancer pain prevalence, cancer pain effects, and cultural factors in cancer pain management. The findings in a show that the majority of respondents (65%) and (77.6%) consider alternative medication, Quran and Somali herbs respectively. In as much the alternative medication was deemed necessary, it could not be measured statistically, and thus was eliminated from the correlation and regression analysis.

A correlation analysis was conducted on the main variables to determine if they have any relational effect on each other. The findings show that pain management had a positive relationship with pain prevalence, r (0.270); the relationship was statistically significant (p-value < 0.01). The relationship between pain management and effects of cancer pain

was positive, and the strongest, r (0.949); the relationship was statistically significant (p-value < 0.01) as highlighted in Table 4.13

Table 4.13: Correlation Variables

Variables		1	2	3
Pain Management	Correlation	1		
	P value			
Pain Prevalence	Correlation	.270**	1	
	P value	.009		
Effects of Cancer pain	Correlation	.949**	.293**	1
	P value	.000	.004	

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

A positive statistically significant relationship between cancer prevalence and pain management (p-value <0.01); the null hypothesis is rejected. Similarly, a positive statistically significant relationship between the effects of cancer pain and pain management (p-value < 0.01); the null hypothesis is also rejected.

4.1.12 Ordinal Regression of Pain Management Factors

Other factors affecting pain management included the rate which daily drug intake done and impact on ECOG performance. ECOG is a scale used by oncologist and researchers to assess how a patient's disease is progressing, and how it impacts patients' daily activities. For this study, (99%) indicated they take daily pain drugs, which affected their ECOG performance status. For an ECOG score of 0 a patient is fully active and carries his/her duties without hindrance. A score of 1 comes with restriction in patience physical strenuous activities, but can carry light housework. Score of 2 means the patient is ambulatory and not able to carry any work activities. a score of 3 means the patient is capable of limited self-care and refined to bed. and a score of 4 means the patient is entirely disabled, and cannot carry on any self-care. The findings of this studies show (78%) ECOG 1 status; (75%) having experienced ECOG status 2, while only (78%) had

experienced ECOG status 3. The findings also show that in all cancer categories, female was less likely to experience cancer pain compared to the male (OR=0.67). However, the experience is not statistically significant (p-value > 0.05). Those whose ECOG status slightly affecting were more likely to experience cancer pain compared to those whose ECOG status are affected (OR=1.125). The patients experiencing ECOG pain level 3 and 3 had a statistically significant pain threshold level (P value <0.05) as summarized in Table 4.15

Table 4.14: Factors Affecting Cancer Pain

Variable	Cancer Pain		OR (95% CI)	P-value
	Yes	No		
Sex				
Male	31 (73.81%)	11	1.00 (Ref)	
Female	42 (80.77%)	(26.19%)	0.67 (0.25 –	0.422
		10	1.78)	
		(19.23%)		
Daily Pain	93 (98.9%)	1 (1.1%)	-	-
Medication in 7 Days	93 (98.9%)	1 (1.1%)	-	-
ECOG Status				
0	0 (0%)	0 (0%)		
1	29 (78.38%)	8 (21.62%)	1.00 (Ref)	
2	12 (75%)	4 (25%)	2.483 (1.82 –	0.000
3	32 (78.04%)	9(21.96%)	3.66)	0.002
			3.421 (1.25-	
			3.78)	

4.1.13: Effects of Cancer Pain

To examine the effects of cancer on patient's state of being, Psychological pain, the study examined how cancer pain had affected patients physically, psychological, social, and spiritually. Male patients who indicated psychological pain as effect of cancer were (73%), while women were (52%); (OR = 0.72). Men were more likely to experience psychological pain than female, but the variability was not statistically significant (p-

value > 0.05). On physical pain, both male and female who indicated they experienced the pain were (34.2%); (OR = 0.54). Men were more likely to experience physical pain than female, but the variability was not statistically significant (p-value > 0.05). When Physical and Social Pain was combined, (34.2%) of patients experienced the pain; (OR = 2.36); Men were more likely to experience both physical and social pain than female. The variability between men and female was statistically significant (p-value < 0.05). When asked about psychological, physical and social pain, (8.2%) of patients experienced the pain; (OR = 2.72); Men were more likely to experience psychological, physical and social pain than female. The variability between men and female was statistically significant (p-value < 0.05). The combined physical, social, spiritual; and physical and spiritual equally had statistically significant relationship between cancer pain and associative pain; (p value < 0.05) as summarized in Table 4.15.

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Table 4.15: Effects of Cancer Pain

Variable	Cancer Pain		OR (95% CI)	P-value
	Yes	No		
Age	73 (77.7%)	21 (2.3%)	-	0.448
Sex				
Male	73 (%)	1 (2.4%)	1.00 (Ref)	
Female	52 (100%)	0 (0%)	0.72 (0.475 – 1.549)	0.298
Effect of Cancer Pain				
Psychological pain	12	3 (14.3%)	1.00 (Ref)	
Physical Pain	(16.4%)	10	0.536 (-0.821 –	0.439
Psychological pain	25	(47.6%)	1.892)	0.087
&	(34.2%)	1 (4.8%)	-1.202 (-2.58 –	
Physical Pain	1 (1.4%)		0.177)	0.403
Social Pain		1 (4.8%)		0.368
Spiritual Pain	0 (0%)	0 (0%)	0.579 (-00777 –	0.001
Physical and Social Pain	1 (1.4%)	4 (19%)	1.936)	
Psychological, Physical &	25(34.2%)	0 (0%)	0.624 (-0.734 -	0.000
Social Pain	6 (8.2%)		1.981)	0.000
Physical, Social, Spiritual		0 (0%)	2.36 (0.908 - 3.811)	0.000
Physical and Spiritual	1 (1.4%)	1 (4.8)	2.715 (1.219 -	
	0 (0%)		4.211)	
			4.173 (2.252 --	
			6.094)	
			4.875 (2.506 –	
			7.245)	

4.1.14: Regression of Variables

A regression analysis between variables was conducted to establish the level of relationship between pain management, pain prevalence, and effects of cancer pain. The findings show an adjusted R value of (0.898), meaning, (89.8%) of variability in pain management, effects of pain and cancer pain prevalence as indicated in Table 4.16

Table 4. 16: Regression Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.949[a]	.901	.898	.10587

a. Predictors: (Constant), Effects of Cancer Pain, Pain Prevalence

The Analysis of Variance (ANOVA) was also conducted to establish whether there existed significant variance in the means of between pain management, effects of cancer pain, and pain prevalence, $F_{(2, 91)} = 4.622$; (p value < 0.05) meaning the mean difference between the variables was statistically significant as summarized in Table 4.17 .

Table 4. 17: Analysis of Variance

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	9.243	2	4.622	412.321	.000[b]
Residual	1.020	91	.011		
Total	10.263	93			

a. Dependent Variable: Pain Management

b. Predictors: (Constant), Effect of cancer Pain; Pain Prevalence

The regression coefficients show that effect of pan has the highest standardized Beta coefficient β (0.952); p value < 0.05 meaning on the regression model, effect of pain was statistically significantly. The Beta coefficient β (-0.009) for pain prevalence was not statistically significant as summarized in Table 4.18.

Table 4.18: Regression Coefficients

	Unstandardized Coefficients		Standardized Coefficients		
Model	B	Std. Error	Beta	T	Sig.
(Constant)	-.384	.095		-4.034	.000
Pain Prevalence	-.019	.070	-.009	-.268	.789
Effect of cancer Pain	1.400	.051	.952	27.532	.000

a. Dependent Variable: Pain Management

4.1.15 Focus Discussion Analysis

This study used content analysis to examine data from focus group discussions about cultural ways patient had adopted to manage their pain. A total of 15 (5participants in each group) participants attended the face to face focus group discussion of this study, comprising of 6 men and 9 females. Drafted notes and audio recordings transcription were used to capture the data for analysis. The topic of discussion was cancer pain management

and we divided the subtopics in to a) patient awareness of their condition b) participants experience of pain and its intensity, c) intervention they carry out to manage their pain and d) what can be done to improve their pain control.

Majority of patients who were of Somalis ethnic did not mention their clinical diagnosis 'cancer' and labeled their diagnosis as 'XANNUN' throughout our discussion which means in Somali language pain or any type of illness. However, the non-Somali patients opened said their diagnosis as cancer. Participant graded their pain as moderate to severe. When asked what pain medication they use to manage their pain, most did not know, but few managed to recall the drugs:

> *"We are given Paracetamol, Aspirin and Morphine, but sometimes when we are to go the hospital we find there are no drugs, so we have to use the drugs we have very carefully so we don't run out" (Participant 2, FDG 2).*

When asked whether they understood the dosage of pain medication and when they are supposed to be taking the medication, participants seemed not to understand the correct dose and frequency for their medications (outpatient) and the inpatient were reluctant to ask for pain medication because they didn't want to bother the health workers in the ward.

> *"Sometimes I take two tablets, sometimes I take three depending on how much pain am feeling… but when am almost running of drugs, I can use one tablet per day to manage my pain so I don't run out… most of the time, the nurse gives us the dosage of how much pain killers to take, but sometimes I take two tablets and pain does not stop so I have to take more till I feel less pain" (Participant 4, FDG 1).*

4.1.16 Challenges Associated with Access to Pain Treatment

This study sought to establish some of the challenges that were associated with access to cancer pain treatment. The findings from the FDGs show that distance, poor communication, and negative attitude from nurses impede patience access to pain treatment. It was reported that pain medications were not easily accessible to most of the

respondents of this study. For instance, many patients reside many kilometers away from Garissa town. The GCRH is the only hospital in the region with the capacity to treat cancer patients with pain. However, patients have to travel from Ijara, Modogashi, Lagdera, Tana River, Kitui, Daddab and Fafi, some being more than 100kms from GCRH. Lack of transport mechanisms makes it difficult to travel to the hospital. One of the challenges facing the patients was the poor communication between nurses and the patients. For, instance, one of the participants in the FDGs noted that:

> *"…sometimes I just want to be a good patient and not to disturb the nurses or doctors with my pain… you keep calling on the nurse or a doctor, they think you are annoying, or you are a bad patient…since I want to be a good patient, I keep quiet even though a suffering" (Participant 5, FDG 3)*

> *"If I talk about pain, it could distract a doctor from curing the cancer, so I don't tell the doctors if my pain is getting worse…also if I talk about pain, people will think that I am a complainer or coward and I don't want to be seen that way: (Participant 1, FDG 3)*

In other instances, it was reported that GCRH has limited staff in the palliative clinic making it difficult for the current health care staff to effectively attend patients in pain and in urgent need of medical attention. The negative attitudes of the nurses towards patients were reported by the respondents as one of the challenges facing patients' access to medical treatment.

> *"I feel that as a cancer patient, I don't always get the support I need from the nurses...in Garissa, there is one nurse who is very knowledgeable concerning palliative care. If this nurse goes on leave, or has an off day, there is no hope that you will get assisted by other nurses or you will get your pain medicines. Most nurses are not sympathetic, or lack knowledge about palliative care" (Participant 2, FGD 3)*

When patients were asked whether their medication was always available every time they visit the hospital, the findings show that majority (82%) indicated they do, while (18%) indicated they don't find medication. However, the majorities who have indicated they do find medication do not show a clear picture on status and availability of medication.

Drawing from the finding and respondents were asked to indicate the kind of drugs they use at 'least pain' and 'worse' pain. The findings revealed that majority of respondents were using wrong medication for different levels of medication. When this finding was triangulated with the response given by the nurse in charge of palliative care, the findings show that there is a lack of adequate medication:

> *"Sometime the hospital does not have Opioids that correspond to patients' pain level. In such cases, patients are given drugs that are close to their pain level. However, pain management is made difficult when some patients cannot make it to the hospital for regular check-ups due to distance…patients come from long distances in the larger Garissa sub counties and wards that are far from GCRH" (Nurse A, KII, 2018)*

Cultural management of cancer pain

Cancer paitients who participated in FDGs were question on what alternative approaches they consider for cancer pain control. Some of the alternative medicine listed by the FDGs included Somali herbs such as '*Malmal*' known comiphoramyrra ,*'huruud'* Turmeric, *'qorfe'* Cinnamon, '*hulbad'* Fenugreek, 'sinjibiil' Ginger, '*filfil'* Black pepper, 'Likke' (root of the tree crashed to form powder Diinsi). In responding to why they use the Quran, one of the FDG members noted as follows:

> *"I believe that in reading the Quran I will not only be able to manage my pain… I feel better… I believe I will be healed…I believe Quran is a miracle that was sent by Allah to be a blessing to us both spiritually and physically, and to cure us from any ailments…the words of the Quran are "Shifa" meaning they are able to heal us" (Participant 1, FGD 1)*

> *According to the Islamic beliefs, the Quran can be used to treat all manner of ailment, including my cancer. The "Ruqyah" provides me with the opportunity to use the Quran as the word of Allah, for healing and also "duas" as the words taught by the prophet on healing" (Participant 5, FDG, 1)*

In other instances, the study found that apart from relying on traditional herbal medicines, patients relied on heat and cold therapy, and in worse scenarios, some patients used hot metals:

> *"I have used hot metal and objects to places I was feeling severe pain…when the "Malmal" (comiphoramyrra) wasn't giving me enough relief, I would use a hot metal on my back and arms to relieve my pain…but I also know other patients who use cold therapies, where they put ice-cubes in a bag and place it on places they are feeling pain" (Participant 3, FDG 4)*

When asked whether heat therapy or cold worked in the long term, they indicated this measure were short term for pain relief. In moments when pain became unbearable, they would seek medical help from the hospital

> *Some of the alternative medicine listed by the FDGs included Somali herbs such as 'Malmal' known comiphoramyrra ,'huruud' Turmeric, 'qorfe' Cinnamon, 'hulbad' Fenugreek, 'sinjibiil' Ginger, 'filfil' Black pepper, 'Likke' (root of the tree crashed to form powder Diinsi). In responding to why they use the Quran, one of the FDG members noted as follows:*
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> *"I believe that in reading the Quran I will not only be able to manage my pain… I feel better… I believe I will be healed…I believe Quran is a miracle that was sent by Allah to be a blessing to us both spiritually and physically, and to cure us from any ailments…the words of the Quran are "Shifa" meaning they are able to heal us" (Participant 1, FGD 1)*
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> *According to the Islamic beliefs, the Quran can be used to treat all manner of ailment, including my cancer. The "Ruqyah" provides me with the opportunity to use the Quran as the word of Allah, for healing and also "duas" as the words taught by the prophet on healing" (Participant 5, FDG, 1)*

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When asked whether heat therapy or cold worked in the long term, they indicated this measure were short term for pain relief. In moments when pain became unbearable, they would seek medical help from the hospital

Participants were 5- 6 patients in three sessions. Saturation was achieved, and the following themes were identified

Table 4. 19: Focus Group analysis (Emerging Themes from Qualitative Analysis)

Question posed	Emerging Themes	Categories
Patient own cancer pain assessment	Moderate to severe pain	High level of pain
Patient perception of their pain	Cancer Pain has robbed of the simplest of tasks of walking and pleasure Feeling desperation Fatigue/sleep disturbances The feeling of anger and mood disturbance Pain is in control of their life Feel they have inadequate information regarding their condition	Pain has control over patients' life physically, socially and psychologically.
Patients' perception of nursing and institutional pain control	Found difficult to express their expectations of nursing and institutional pain management Found difficulty to express nursing in cancer pain management competencies Feel it is not good to always complain and report of pain, healthcare workers will see as a' bad patient.' Feel they have less support from the nurses and other medical personnel Feel their pain is not well controlled in the institution Expressed inaccessibility of pain medication Expressed the shortage of palliative care nurses at the palliative clinic (one nurse) one patient A said '' *when the one nurse is on leave from*	Poor interaction between patients and nurse The negative attitude towards health care workers especially the nurses Poor palliative care services and inaccessible analgesic.

	palliative clinic no hope of getting medicine or other support. '	
Patients pain control methods	Reading/ recitation of Quran (Most effective and frequently used) Pain medication from the hospital Use of herbal medicine such as Malmal' (comiphoramyrra) 'huruud' Turmeric, 'qorfe' (Cinnamon) 'hulbad' (Fenugreek), 'sinjibiil' (Ginger), 'filfil' (Black pepper), 'Likke/ Diinsi Burning at the site of pain with hot metal Heat and cold therapy massage	Social cultural practices such various traditional herbs for cancer pain management Spiritual therapy using Quran is believed as a method of cancer pain management.
Challenges in pain management (patients' perspectives)	inaccessible pain medications since the most patients were travelling from far in order to get to analgesics Not to disturb the nurses or health workers / to be a 'good patient.' Doctors might find it annoying to be told about the pain that persistent Reports of pain could distract a doctor from curing the cancer If I talk about pain, people will think I am a complainer Limited staff in the palliative clinic Negative attitudes among health workers	Negative attitudes by nurses and other health workers Poor communication between nurses and cancer patients
How to overcome challenges in pain management of cancer	They feel the healthcare workers/nurses and institution know better The need for more trained staff in the palliative clinic inaccessibility of pain medication in many centres of Garissa County	Belief health worker can solve their challenges pain control medication is inaccessible at GCRH

4.2: Phase Two Research Findings

4.2.1: Introduction

Findings of phase two of the study deals with testing of 'Xannun' nursing care model that was developed as result of phase one analysis. The development of 'Xannun' Nursing Care Model was from the gaps identified after phase one analysis of this study. The developed 'Xannun' nursing care model was then subjected to a test to see whether it can be implemented at GCRH. Questionnaires were administered to 10 participants consisting of 5 nurse consultants teaching in various universities in Kenya who are expert in the model development and five nurse managers working at GCRH. The result of their comments and inputs regarding the model was then adapted. Both closed-ended and open-ended were used, and they were descriptively analysed. Some participants' quotes were also adopted.

4.2.2 Model Results

On the question of whether the Xannun Model captures the challenge of cancer pain management, the majority (80%) noted this to be the case, while (20%) indicated that the model does not capture cancer pain management as summarised in Table 4.20

Table 4.20: Xannun Model Captures Challenge of Cancer Pain

Scale	Frequency	Per cent
Yes	8	80.0
No	2	20.0
Total	10	100.0

Respondents who indicated the model did not capture pain management notes this reason as follows:

"…the model does not provide the degree of pain" (MR 6)
"…Nurses have not been sensitised to the model" (MR 4)

On the question on whether nurses were able to understand how to use the Xannun Model, the majority (60%) of respondents noted that nurses can understand the model, while (40%) felt that nurses, as highlighted in Figure 4.16, could not understand the model.

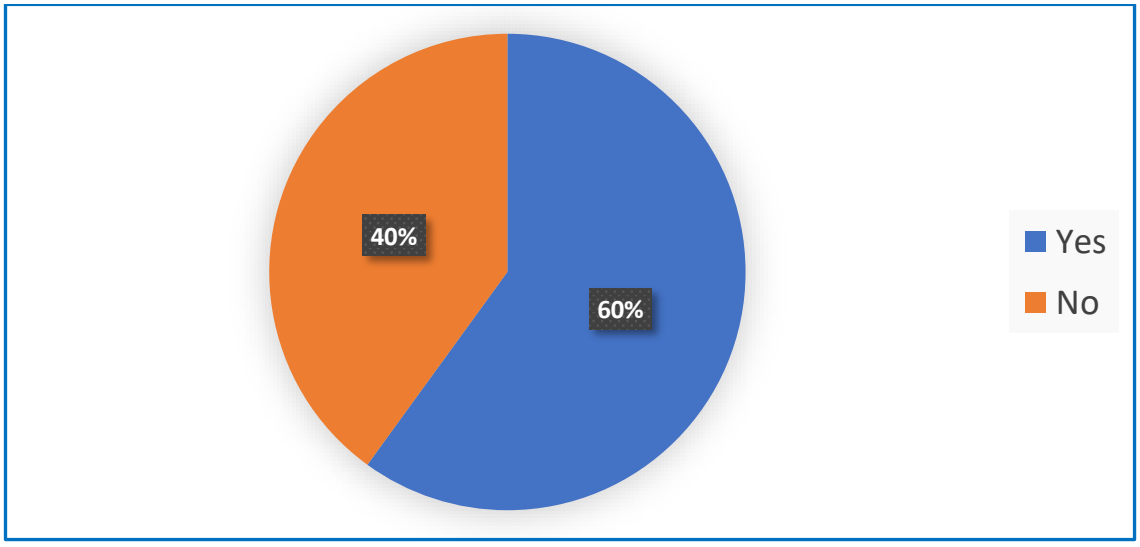

Figure 4.17: Nurses Ability to Understand the Xannun Model

When respondents were asked whether the language used on the model was clear and whether it communicates to the nurses, (80%) agreed on this to be the case, while (20%) noted that the language was not clear and could not be understood by nurses as indicated in Table 4.21

Table 4.21: Xannun Model Language if Clear and Understandable by Nurses

Scale	Frequency	Per cent
Yes	8	80.0
No	2	20.0
Total	10	100.0

The question on whether respondents the model will bring any change to the care of cancer pain, all the ten respondents (100%) felt that the model was enough to bring change in cancer pain management as highlighted in Table 4.22.

Table 4.22: Xannun Model and Changes in the Care of Cancer Pain

Scale	Frequency	Per cent
Yes	10	100.0

When asked whether the Xannun Model would be implemented in Garissa County Referral Hospital, all the respondents (100%) felt that given a chance, Garissa County Referral Hospital should implement the model as highlighted in Table 4.23

Table 4.23: Xannun Model Implementation at GCRH

Scale	Frequency	Per cent
Yes	10	100.0

Respondents were asked whether they thought the implementation of the Xannun Model would bring positive change to palliative care. The majority (90%) of respondents noted that the model was well-designed to bring positive change in palliative care, while (10%) thought the positive change would not be enhanced as indicated in Figure 4.17.

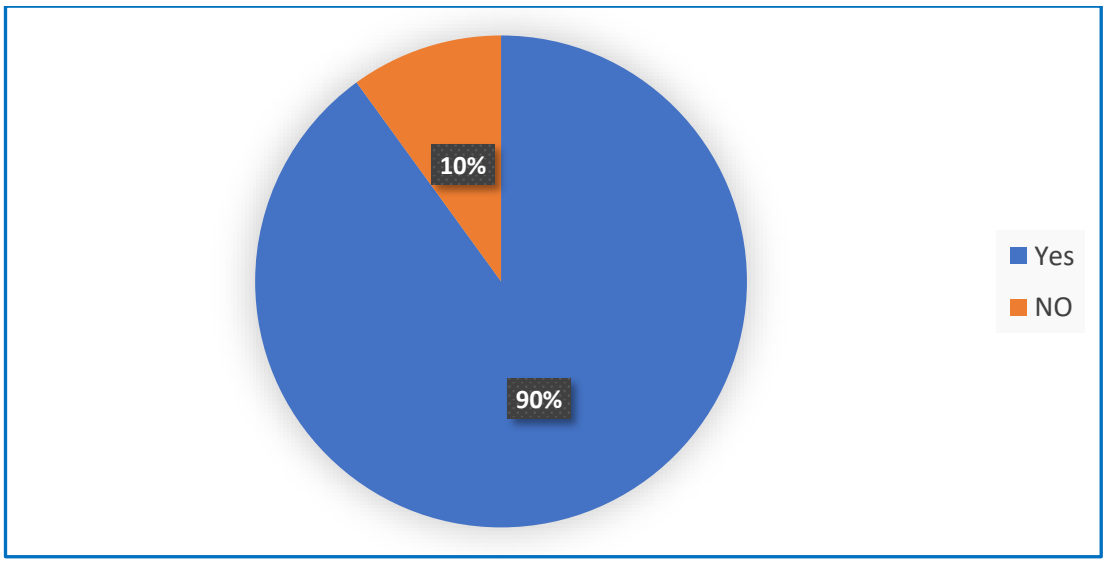

Figure 4. 18: Implementation of Xannun Model and Positive Change in Palliative Care

Respondents were asked whether they felt like Xannun Model will face challenges in implementation; the majority (90%) noted that the model would face challenges during implementation, while (10%) felt that the model will not face any challenges during implementation as summarised in Figure 4.18

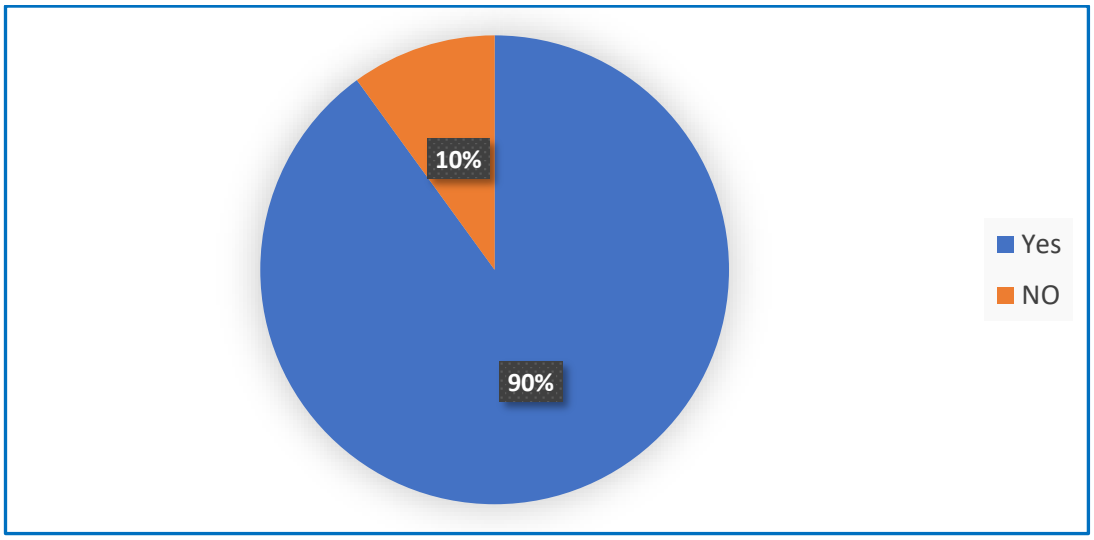

Figure 4. 19: Potential Challenges in Implementation of Xannun Model

4.2.3 Challenges of model implementation

The main challenges emerging from the findings include language barrier, inadequate training of health care workers, inhibitive community cultural practices, limited or shortage of resources for cancer pain management, inadequate model knowledge, and inadequate staffing

These challenges could be solved by: translating the model into the local language; training of health care workers on the model, equipping GCRH with necessary palliative care equipment, adopting a multidisciplinary approach to cancer pain care, educating the community on the importance of palliative care, lobbying for funds for implementation from county government, National government, and development partners, and finally active involvement of nurses in decisions towards implementation of Xannunn Nursing Care Model, or any other matter concerning cancer pain management.

4.3: Development Of 'Xanuun' Nursing Care Model

4.3.1: Introduction

This part of chapter four is on the development of a model of nursing care known as 'Xannun' nursing care model for cancer pain management. Following the analysis of phase one of the study identification of gaps that hinder adequate cancer pain management, then was development of nursing care model. This contextual model is seen to improve pain management of cancer patients once it's implemented.

4.3.2 Models of Nursing Care in Cancer Pain Management

Authors' assumptions in their theory often design models of nursing care and provide an impression of the thinking behind their theory. Models of cancer pain management are focused on addressing the various levels of health care delivery. According to Dzau and Pizzo (2014) models on cancer pain are offered at the primary level by practitioners where

routine assessment and screening of pain is done and subsequently managed or referrals. Prevention of Cancer pain at primary level is focused on preventing environmental aspects that will stimulate or increase the intensity of pain and further prevention chronic cancer pain development. This can be done through a focus model of care that appraises the full range of biological, psychological, and social effects of pain on the individual. Pain prevention strategy includes improved self-management care, improved knowledge, skills, confidence, reduced and coping skill with cancer pain. Thus emphasising the utilisation of an appropriate assessment tool, that results in measurable outcomes. On the other continuum, a secondary level of pain management will focus on the provision of care by pain specialists who provide consultation that includes multidisciplinary team approach interventions, behavioural healthcare, and operational research. At the tertiary level of Cancer, pain care encourages advanced medical diagnostic and interventions based on rehabilitation therapy According to Musto and Polomano (2011) nursing models are essential as they allow the concept in nursing theory to be applied in clinical practice for better patient care delivery.

Gustafsson and Borglin (2013) study assessed whether a theory-based educational intervention model could change nurses' knowledge and attitudes towards cancer pain management. Gustafsson and Borglin (2013) study found a sufficient improvement on Registered Nurse's knowledge and attitudes on cancer pain. This study reported an improvement of knowledge and attitudes from baseline to four weeks of intervention had a statistically significant of ($p<0.05$).

In addition, Bartoszczyk and White (2015) did a study on a comprehensive literature search on published nursing interventional models on pain management and concludes that an understanding on cancer pain interventions models to overcome challenges of

effective pain management can provide valuable information for nursing educators, administrators and policyholders during educational programs for nurses. Bartoszczyk and White (2015) further uphold that improved educational programs will help nurses to apply pain management skills and provide better pain care for cancer patients. This will further enhance knowledge that can contribute to improved pain outcomes for cancer patients

However, nursing care models are dynamic depending on the setting and context of the application and thus believed to improve healthcare delivery, and patients care outcomes. Unlike the other exiting nursing care models, 'Xannun' nursing care model is unique model which is based on the gaps identified in phase one of this study. These gaps are unique because they reflect the natural contextual needs of a nomadic pastoralist cancer patient, seeking health services for pain management. 'Xannun' model addresses the unique cultural beliefs of Somali patients seeking modern health services. This model considers the significance of spiritual practice in pain management and the use of Somali herbs in alleviating cancer pain. The model also addresses the inaccessibility of modern pain medication to cancer patients who have to travel for long distance for palliative care services. Subsequently, Xannun nursing care model demonstrates the importance of nurses' knowledge and attitude in cancer pain management as primary health providers in rural Keny and significance of community sensitisation on cancer pain management approaches.

Table 4. 24: Gaps and solutions in Phase one of the study

Gapes identified in phase one	**Solutions**
High prevalence of cancer pain at GCRH inadequate pain control at GCRH cancer pain has adverse effect on mood, walking and relationship with others limited knowledge of nurse on cancer pain management and inadequate use of WHO analgesic ladder Negative attitudes among nurses towards cancer patients Poorly equipped facility for cancer pain management Lack of policies and guidelines on cancer pain management Lack of standardised tool for cancer pain assessment Social-cultural dynamics or alternative traditional medicine for cancer pain management Nomadic lifestyle and inaccessibility of palliative services	Short course on pain assessment and management of cancer Training of Nurses on Palliative care and Cultural Dynamics Review of the basic nursing curriculum to increase hours of teaching on palliative care Establishment of Mobile Clinics to enhance pain medication at the peripheries of Garissa County. Initiate Multi-disciplinary palliative Care Centers Creating Awareness by Providing Civil Education to patients after empowering the nurses Improving/Upgrading Cancer Pain Management Facilities Improving Supply /availability of Pain Medication Appraising Spiritual Therapy (Quran) Understanding Alternative Cultural Approaches by Nurses

In addition, Vallerand et al., (2011) explain the advancement of nursing care in health systems such as advanced in practice in education and evidence studies in the field of cancer pain management. Vallerand et al., (2011) argued that nurses have contributed to pain science and worked on the areas of pain assessment and management. Some nursing care models exist in intervention-based research, evidence-based practice, oncology

patient education, and palliative care. In such interventions of cancer pain management nurses served as advocates for enabling patients to engage in self-management of their pain and provided education to patients and families. Vallerand et al., (2011) upholds that researchers in the nursing field have championed to develop nursing care models, testing of new instruments, approaches to quantify pain and control pain through quantitative and qualitative methodologies. Nursing models have been developed to explore patients' experiences in pain, assess the quality of pain care for patients and its effect on their caregivers.

XuanWang and Xian-Cui Wu (2016) did a study to determine the benefits of applying a transitional care model in the field of cancer pain management on patients discharged from the hospital. XuanWang and Xian-Cui Wu (2016) study recruited 156 eligible participants who were randomly allocated to intervention or control groups. The control group was receiving standard care, whereas the intervention group was given extra, specialised transitional care of pain management. Outcomes were measured at weeks 0 and two until week 4 and included demographic data of the patients. The Brief Pain Inventory results, Satisfaction degree of nursing Service and global quality of life scale. In addition, the aspect of Adequacy of analgesia and severity of pain was evaluated with the Pain Management index and interview findings. Application of a transitional care model in cancer pain management was found to have improved patients' cancer pain management knowledge and their analgesics compliance. Transitional model of care also contributed to effective communication between health workers and cancer patients which further improved their therapeutic relationship. Nursing care models have offered a feasible solution to overcome to barrier effective pain management.

Jahn and Landenberger (2010) carried out a study on self-management of cancer pain skills that affect the patients' knowledge, activities and attitude to pain control. This study aimed to test programs and interventions that were tailed to improve cancer pain management such as SCION-PAIN program, a multi-modular structured intervention. Sample sizes of 240 patients diagnosed of cancer were recruited to participate in a randomised cluster trial of 18 wards in 2 German university hospitals. The SCION-PAIN program consisted of 3 modules that include pharmacologic pain management, non-pharmacologic pain management and discharge management that was conducted by oncology nurses. The components of patient education, skills training and counselling was considered to improve self-care regarding pain management. This study concluded that the self-management program on cancer pain would result in a substantial reduction of the patient associated pain management barriers in one week after discharge from the hospital.

Bartoszczyk and white (2015) did a critical analysis of published studies about the improvement of adult cancer pain management using educational intervention on nursing staff. This study used a range of search engine to get information on intervention regarding nurse associated barriers practices in cancer pain management. This study found nine previous studies, which were experimental and were conducted from 1993 to 2013. Bartoszczyk and white (2015) study concluded that improvement in knowledge would change the behaviour and attitudes of clinical nurses. The change coupled with excellent rapport with specialists was established to be significant in overcoming current nursing practice barriers to management of cancer pain. Reviewed studies revealed that educational intervention enhances knowledge than improving nursing attitudes. Specialists were recognised as a role model for nurses and a vital resource if both parties gained the trust. This study also acknowledged the scarcity of literature on educational

interventional that overcome cancer pain management. The scarcity is because they only found nine studies in the span of 20yeas to meet the criteria of their study.

4.3.3 Steps for Developing A Model of Cancer Pain Management

The process is five steps of developing a nursing care model for cancer pain management, adapted from the literature review (Conway and Higgins 2011)

Table 4. 25: Five Steps of developing a nursing care model for cancer pain management

Step 1
Understanding the existence and magnitude of cancer pain in globally, Kenya and Garissa through literature review and various models of care from search engines.
Understanding the appropriate nursing theory for application in the development of the nursing care model
Develop tools and methodology for gathering information for the model of care
Step 2
Defining and understating dynamics of cancer pain management at Garissa context through data collection from the cancer patients and health workers at GCRH
Understanding the current status of cancer pain management in GCRH
Step 3:
Developing the best practice using the model of care matrix template to come up with the nursing care model for cancer pain management tailed for the nomadic pastoralists at Garissa county
Translation of evidence-based research from GCRH and expert opinion into a test at GCRH before implementation
Step 4:
Consultation of the nursing care model mainly with all relevant stakeholders and incorporating feedback as appropriate to produce a model of care that can be implemented by nurses
Step 5:
Endorsement of the nursing care model for pain management by the palliative and oncology networks through county health system and GCRH management

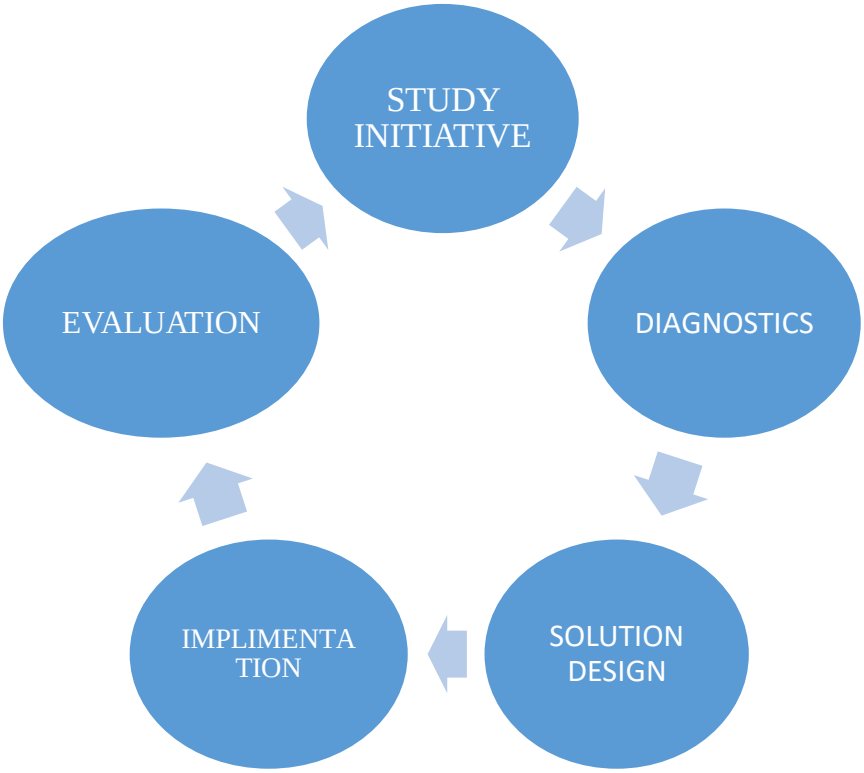

Figure 4.20: Summary Flow Chart for Developing Model of Care

Study initiative includes: Proposal development, Ethical approval and Data Collection on the ground before developing the model of care of this study

Diagnostic entails challenges identified in Cancer Pain Management such as Limited Staff with pain management knowledge, limited facilities offering pain medication, other alternatives for pain control used by the community, Stigma for being Cancer patient "death sentence" and desk review of other related studies.

Solution Design developed a model that captured the need of cancer patient and developed a simple tool for pain assessment in marginalised areas, such as Garissa. The development was done in consultation with stakeholders for implementation.

Implementation: study report was shared with stakeholders to improve cancer pain management such as Capacity Building of staff, decentralisation of pain management

centres/ mobile clinics, empowering the palliative centre of Garrisa County Referral Hospital.

Evaluation: Monitoring and Follow up of the recommendation given during implementation.

'XANNUN' MODEL OF NURSING CARE FOR CANCER PAIN MANAGEMENT

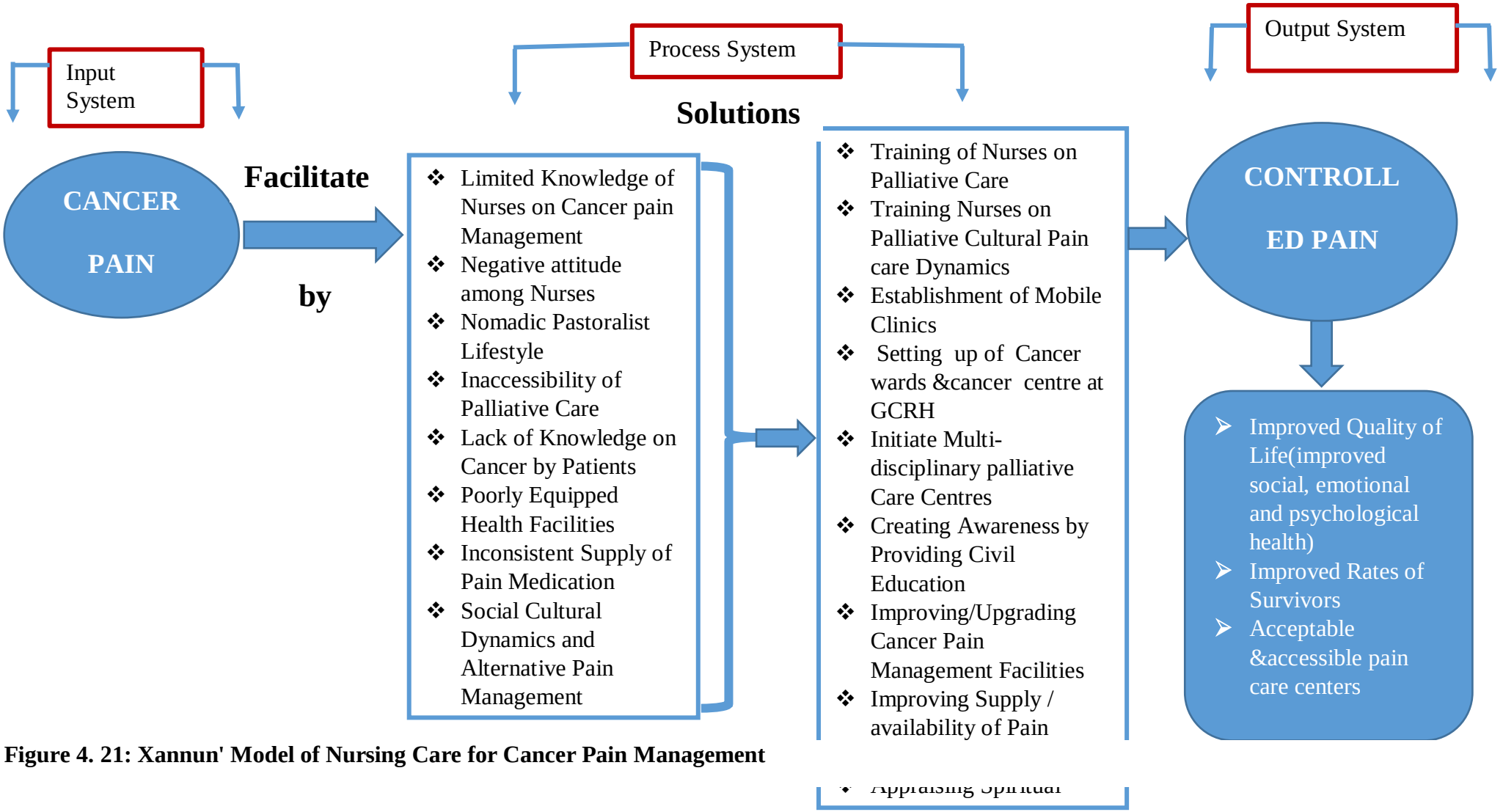

Figure 4. 21: Xannun' Model of Nursing Care for Cancer Pain Management

4.4: Discussions

4.4.1: Introduction:

The essential variables such as cancer pain prevalence, use of WHO analgesic ladder in cancer pain management and social-cultural influences on cancer pain management will be discussed. The discussion will generally focus on cancer patients' response on how frequent they experienced pain, the effect of cancer pain, what sort of cancer pain intervention they receive at GCRH, including the knowledge of their caregivers (nurses) on cancer pain management and sociocultural perspective of cancer pain management. The discussion will further include the gaps identified in phase one that stimulated the development of 'Xannun' nursing care model.

Descriptive statistics were used to describe the basic features of the data in a study. It provides a simple summary about the sample and the measures through the mean, standard deviation, mode median among others. Together with simple graphical analysis, they form the basis of virtually every quantitative analysis of data (Tronchim, 2006). The study used descriptive statistics to present the mean, standard and percentages of the gathered data on the relationship between the cancer pain management and the independent variables ranging from patient's perception to psychological and spiritual support. An overall response rate of 70 per cent was achieved it was considered sufficient to provide data to determine the relationship between cancer pain management and the independent variables in GCHR. The relationship was in line with Orodho (2009) postulate that a response rate of above 50 per cent contributes towards gathering of sufficient data that could be generalised to represent the opinions of the respondents about the study problem in the target population. The study respondents included 42 men and 52 women of cancer patients, 84 clinical nurses and 15 key informers.

4.4.2: Prevalence of cancer pain and cancer situation at GCRH

The composition of 42 males and 52 females, translates to 44.7% and 55.3% respectively. As this is good indication that there was minimum biases in the results. As presented in Demographic Analysis, majority 40.4% (38) of the respondents were 51-65 years in age, followed by 35-50 years with 33% (31) then above 65 years were 23.4% (22) and least below 35 years with 3.2% (4). On average, most cancer patients learned about their situation within less than two years, and the pain was the primary symptom at the time of the first diagnosis. The findings conform to many studies that show aged people are prone to cancer as compared to young people.

This study has revealed that more than a third (39%) of the patients were diagnosed in the first six months of their visit. They were diagnosed when the pain was unbearable. Besides feeling helpless and angry at the diagnosis, most patients were worried about the wellbeing of their families since they were depended upon for livelihood. The most prominent cancer among men was prostate cancer (67%) for men above 65 years, and breast cancer was the most prevalent with (53%) of women respondents affected being aged above 65 years. The higher prevalence of Oesophagus, Cervical, Breast, Prostate, Stomach and Liver cancer in Garissa County Referral Hospital is mainly due to lack of knowledge on early awareness diagnosis and screening of cancer by patient with nomadic lifestyle, ill-equipped health facilities in this marginalized part of Kenya and inaccessible palliative care services in the County. A study by Namukwaya et al., (2011) has noted that limited resources and poor palliative care are a problem with most developing countries, and therefore, the case for Garissa is mere confirmatory, and not an outlier.

There is a high prevalence of cancer pain revealed in this study. Majority of the patient, 78% reported cancer as a primary cause of their pain, similar to Paice and Ferrell (2011) study that established global cancer pain prevalence at 25% for those newly diagnosed, 33% for those undergoing active treatment, and greater than 75% for those with advanced disease. The chronic stage had the highest pain prevalence at (90.9%) which was higher than the global estimate of (75%) established by price and Ferrell (20.

In Kenya, a previous study by Ndegwa (2013) and Huang et al., (2013) had also revealed a high prevalence of cancer pain due to the limited treatment options for cancer, patients presenting in an advanced stage, and with limited choice and availability of analgesics. Huang et al., (2013) study at Moi National Referral Hospital in Kenya had reported that the hospital had 66% untreated cancer pain cases, and over 30% having a moderate to severe pain, while Ndegwa (2013) study at Kenyatta National Hospital the biggest referral hospital in Kenya at prevalence of cancer pain at 38.5%. Both of this studies had supported the findings of this study.

Several factors have been noted in this study that explains the high prevalence of cancer pain. In some instance, a clinical nurse under this study noted that prevalence was due to lack of training and adequate personnel and equipment

> *"We have an inadequate supply of pain management medication, and most of the time, we have inadequate pain assessment tools, and more so, most the hospital personnel have received inadequate pain management training" (Nurse 1 FGD, 2018).*

The qualitative analysis also shows that most clinical nurses had an inadequate supply of pain management medication, lack of pain assessment tools and poor training resulting in poor palliative care of patients. GCRH has only one palliative nurse who has multiple tasks and has no ideal palliative clinic operated by a multidisciplinary team. Equally, the content analysis established that nurses lacked specialised training in palliative care, and

those who had received this training did not have the tools to do their work. In other cases, it was reported that inadequate staff trained on pain management negatively affects GCRH ability to offer effective palliative care.

4.4.3: Cancer pain management at GCRH

Most ailing patients at the GCHR were aware of their type of cancer The medical team at the facility informed them after undergoing oncological testing however during the interview; this study noted most patients seemed not able to mention the word cancer, and they used 'Xannun' which broadly means pain or any illness in the Somali language. Earlier diagnosis of cancer is one of the better ways of mitigating future cancer pain. WHO (2017) report notes that early diagnosis and treatment improves pain management. According to WHO (2017) guideline and palliative centres are required to develop public awareness programs on different cancer symptoms and encourage people to early screening and diagnosis.

Pain Management Index (PMI) was computed to analyse the intensity of pain that patients undergo. PMI quantify how well pain is managed with pharmacological intervention. Pain management is calculated by subtracting the patient's pain score from the patients' analgesic score. The pain scores were derived from the patient's responses to the Numerical Rating Scale (NRS) which was scored from 1-10 for pain. Based on previous studies and clinical practice, this study categorized pain screening using NRS scores on MBPI as No pain (0), mild (1–3), moderate (4–6), or severe (7–10), this was compared with WHO analgesic ladder three-step ladder with level 1 for mild pain (1-3); level 2 for moderate pain and level 3 for severe pain. The comparative level of analgesic used was graded as follows: 0 for no analgesic; 1 for non-opioids analgesic used, two was used for mild opioids, while 3 for strong opioids. After calculation of PIM, this study noted

negative PIM which translate inadequate pain management or under treatment. Thus, only (29%) of men and (12%) of women were using the right medication for the right level of pain in line with the WHO analgesic ladder. It can be deduced that when patients say they have received medication it may not be the right per WHO analgesic ladder level. These patients cannot distinguish medication that is meant for different levels, and as such, to them, any medication is right mediation, which is not the case

As the primary providers of healthcare services at the GCHR, it was imperative to understand the background of the clinical nurses in areas such as academic and professional qualifications, skill development as well as their work experience in cancer pain management. Because clinical nurses usually provide direct care to cancer patients in the hospital. These form the basis for the reliability of the information gathered on cancer pain management and some of the practices carried out in the process of cancer pain control management. Majority of clinical nurses interviewed had a diploma at 64.3% (54), followed by certificate holders at 22.6 % (19) while only 3.6% (11) had degrees. It was important to establish the number of years the respondents had served as a nurse to ascertain if they were equipped with relevant knowledge and skills in cancer pain management. The findings show that the majority of clinical nurses 44 % (37) had served between 1-3 years, 36.9% (31) between 4-6 years. 14.3 % (12) had served for over six years, and only 4.8% (4) worked for less than one year. These findings indicate that most of the respondents were qualified to understand the nature of the research problem. The finding concurred with Joppe (2000) who argues that during the research process, respondents with technical knowledge on the research problem can assist since they have reliable and accurate data on the problem under investigation.

81 per cent of clinical nurses said they were not trained/ lack in-depth knowledge of cancer pain management. In addition, the absence of assessment tool and failure to use guidelines on pain medication of adult demographic findings was revealed. Thus, cancer pain management hampered palliative care services given to patients. To compound this situation, when nurses were asked what tool they use to assess cancer patients' pain, a majority 78 % (66) indicated they had no tool. Nurses also reported the lack of standardised pain assessment tool and poor hospital policy regarding the pain care. The challenge with this situation is that cases of pain misdiagnosis are bound to happen. Accurate PMI cannot be accessed effectively if clinical nurses lack the necessary tools to do their work. Nurses were asked to indicate whether they had utilised WHO analgesic ladder for pain management. 83.2 % indicated they did not know how to use the WHO analgesic ladder; 40% indicated they had inadequate information on the WHO analgesic ladder, while only 33.3% had adequate knowledge of the same. The implication of this finding is that poor nurse training, particularly in the use and administration of WHO analgesic ladder for pain management tool. Thus, this could impact negatively on the patients' pain assessment and treatment of cancer pain. This finding also explains why most patients in this study had poorly managed cancer pain. Just like Fallon et al., (2006) study, the WHO (2017) recommends the use of standardised pain assessment tool for better pain management. This study also confirmed findings echoed by Hjermstad et al., (2009) and European Palliative Care Research Collaborative (2009) which states that there is diversity of pain assessment tools designed to assess cancer pain and utilization of standardized assessment tool for adequate pain management is to ensure that cancer pain screening is objectively examined and ascertained in most scientific way possible. Therefore, this study finding reveals that assessment and management of cancer pain lack professional standardised assessment tools for proper pain management, poor knowledge

and awareness of clinical nurses on the use of the WHO analgesic ladder. Over the years, the palliative care sector in Kenya referral hospitals has not been given the deserving attention. Higher pain prevalence is indicative of poor palliative pain care management, which is symptomatic of poor palliative training among the health care workers especially the nurses who provide 24-hour care in health facilities.

Key informants in this study indicated that pain medication is not always available at GCRH, as they associated with inconsistent supply from KEMSA in Nairobi, while others noted that the supply distance from the Nairobi facility is quite long and a hindrance to the availability of the pain medication. Key informants were also asked on how they deal with cancer patients that require cancer pain medication when the medication is not available? They noted that they usually provide patients with whatever pain medication that is available or send them to private clinics and or other public hospitals in the region. Similarly, most clinical nurses agreed that pain control medication was not regularly available at the facility. Likewise, key informers' assessment of cancer pain management at GCRH gave similar findings of the clinical nurses and cancer patients. Thus, the qualitative findings of the key informants revealed the following as most pertinent issues affecting pain management at GCRH:

- Lack of effective palliative care policy or guideline of pain management
- Lack of tool for pain assessment
- Lack of medication or inconsistent medication supply
- Poor institutional infrastructure
- Inaccessibility of palliative care services
- Inadequate training and knowledge on the management of pain among the staff at GCRH

4.4.4: Effect of cancer pain

Due to the high prevalence of pain, this study also assessed the effects of cancer on patient‘s psychological, physical, social, and spiritual state. Male patients who indicated psychological pain as the effect of cancer were (73%), while women were (52%); (OR = 0.72). Men were more likely to experience psychological pain than female, but the variability was not statistically significant (p-value > 0.05).

Men were also more likely to experience physical pain than female, but the variability was not statistically significant (p-value > 0.05). When Physical and Social Pain was combined, (34.2%) of patients experienced the pain; (OR = 2.36); Men were more likely to experience both physical and social pain than female. The variability between men and female was statistically significant (p-value < 0.05). When asked about psychological, physical and social pain, (8.2%) of patients experienced the pain; (OR = 2.72); Men were more likely to experience psychological, physical and social pain than female.

The variability between men and female was statistically significant (p-value < 0.05). Thus, the combined physical, social, spiritual; and physical and spiritual equally had a statistically significant relationship between cancer pain and associative pain; (p-value < 0.05). The variability between men and female was statistically significant (p-value < 0.05).

Apart from the psychological, physical, social and spiritual effect of cancer pain, this study also examined how patients’ walk, mood and relationship with others may have been affected by cancer pain. The study finding indicates that there is an existence of an association between cancers pain and interfering with walking ability of cancer patients, X2 = 6.072, df (3); however, the association was not statistically significant (p-value > 0.05). There was also an association between cancers pain and interfering with patients’

mood, $X^2 = 2.167$, df (3); but the association was not statistically significant (p-value > 0.05). Findings on patients' relationship with others indicated the existence of an association between cancers and the pain's effect on patients' relationships as, X2 = 3.869, df (3); however, the association was not statistically significant (p-value > 0.05). While on qualitative analysis there is the negative impact of cancer pain on patient mood, walk and relationship with others, however, this was statistically significant.

Similar to this study is, Hsueh-Hsing et al ., (2016) study revealed 50% of breast cancer patients experienced a high level of depression and psychosocial disorders resulting to poor treatment outcome and reduced quality of life. Hsueh-Hsing et al. (2013) further explained that depressed mood is negatively related to several physical and psychological prognostic factors of cancer patients.

The study used the ECOG performance status to establish how cancer pain had impacts on patients' daily activities. ECOG is a tool used to assess the progress of the disease and daily physical activities of cancer patients as they received treatment. ECOG 1 status revealed 78% (29), 75 % (12) of patients had experienced ECOG status 2, while only 78% (32) had experienced ECOG status 3. Based on these findings, it is possible that the patient moves up and down the scale due to the effectiveness of their treatment, affecting their ECOG status. The findings also show that in all cancer categories, females were less likely to experience cancer pain compared to the male (OR=0.67). However, the experience is not statistically significant (p-value > 0.05). Those whose ECOG status slightly affecting were more likely to experience cancer pain compared to those whose ECOG status are affected (OR=1.125). The patients experiencing ECOG pain level 3 had a statistically significant pain threshold level (P-value <0.05).

According to the key informers and clinical nurses, some factors inhibiting patients from accessing cancer pain management care. The factors are: long distances that patient travel to access Medicare/medicine; lack of transport for patient; cost of drugs and accessibility; negative attitude towards treatment; poor transport system; nomadic lifestyle; cultural attitudes towards (health worker and patient); inconsistency of pain medicine intake; and not following pain management instructions provided by the caregivers. These factors are similar to Namukwaya et al., (2011) study that noted the challenges of cancer pain management as limited resources and poor palliative care in developing countries.

This study has therefore established that the most inhibiting factors for cancer patient management are associated with a not only system that is composed of inadequate of health workers and lack of institutional policies but also patients related factors that includes their cultural lifestyle and attitudes to treatment. The findings of this study confirm the findings of Fallon et al., (2006) article that noted that the physical damaged of pain and human emotional processing of such information is entwined in the nervous system. Thus, patients' perceptions' like sleeplessness, anxiety and fear that are perceived in limbic system and cortex influences how an individual perceives pain. Hence, uncontrolled pain experience results in mood disturbances and when pain is controlled mood improves. On the other finding exhibited by this study is that patients experiencing pain tended to shy away from approaching nurses and doctors to explain the true state of their pain. This was an occasion by patients' fear of doctors and nurses. Patients noted that asking nurses or doctors for help can be perceived as being rude or annoying. So, to avoid being perceived as stubborn or annoying, patients keep to themselves regardless of their pain. Fallon et al., (2006) had noted this kind of patients' behavior in his article. In his study, he noted that over 80% of cancer pain can be controlled considering patients'

perception as their assessor. The patient feels the nurses or doctors are friendly enough; they tend to be open about their pain and vice versa.

4.4.5: Social-cultural practices in the cancer pain management

The study determined the ethnic background of the patients since every community has its lifestyle that may or may not contribute to the contraction of cancer. In this study, ethnic background was broadly defined as either Somali or non-Somali. Somali people predominantly occupy Garissa town, and so it was expected that they would form most respondents. In the study, there were 68.1% (64) Somalis and 31.9% (30) non-Somalis. The study also gathered their educational background. Education is a key to information, with different level of education; Information gathered can be reliable, as this will ensure varying feedback from different people is considered as opposed to the people of the same level of education. As indicated in most of the respondents at 44.7% had no formal education confirming many studies carried out in the region. Most people living in Garissa are nomadic and hence have low levels of access to education, both primary and tertiary. Most of the cancer patients interviewed earned less than Kshs. 23,670 per month depicting the level of poverty among them

Similarly, Oluyinka and Dlitt (2015) study on experiences of pain among postoperative patients in Ghanaian Surgical hospitals noted that psycho-social and cultural factors impeded effective communications between patients and healthcare workers on palliative care. This finding is not a new phenomenon. Different cultures approach and treat people in authority differently. For most African cultures, patients treat doctors and nurse with high regard and thus why they might feel intimidated, or afraid to approach the doctors of nurses in case of any pain intensity. Oluyinka and Dlitt (2015) study had also found that the health system available in Ghana has inherent biases particularly healthcare

personnel attitudes towards patients and vice versa. The biases in healthcare is similarly exhibited by this study since patients complained fearing to upset nurses while at the same time, they complained about lousy attitude of nurses towards them.

The findings show that patients relied on several mechanisms including religious practices such as reading the Quran and taking some herbal medication. Some of the alternative medicine listed by the FDGs included Somali herbs such as '*Malmal*' known comiphoramyrra , *'huruud'* Turmeric, *'qorfe'* Cinnamon, '*hulbad'* Fenugreek, 'sinjibiil' Ginger, '*filfil'* Black pepper, 'Likke'(root of the tree crashed to form powder Diinsi). The findings show that in all cancer categories, females were less likely to experience cancer pain compared to the male. However, men were more likely to experience psychological and physical pain compared to women,

This finding is in line with the findings by Alebi and Mohamed (2016) who found that cancer patients do sometimes rely on more than forty-seven medicinal plants and traditional healers, particularly in Somali and Ethiopia for the treatment. Garissa being predominantly occupied by Somali community, this explains why patients under this study resorted to various types of herbs. On the use of herbal medicine as had been established by the findings of this study, World Health Organization (2008) study had earlier documented that there is a 70%-80% use of complementary and alternative medicine (CAM) among the public of many developed countries. Equally, Molassiotis et al., (2005) study reported increased use of CAM product by 30% among cancer patients after cancer diagnosis coupled with other non-pharmaceutical like relaxation, guided imagery, hypnosis, and acupuncture. This case is exacerbated in cultural communities that place more reliance on their culture like the Somalis in the management of cancer pain.

Similarly, the National Cancer Institute (2014) had conducted a study on how acupuncture was used as a form of traditional Chinese medicine to manage cancer pain. Although Paley et al., (2015) study concluded that, there is insufficient evidence to prove the effectiveness of acupuncture as a method of pain management. Similarly, in as much as patients for this study have noted various traditional, cultural and religious mechanism for managing cancer pain, there was no sufficient evidence that these mechanisms had worked or been effective. These findings are also in line with Finnström & Söderhamn, (2006) on Somali cultural practices revealed that Somalis do utilise cultural herbs, and religious practices such as the reading of Quran, burning on the site of pain relief. Another study by Maalim (2006) revealed that Somalis community believes that the cause of pain or illness can be God-sent, and therefore, relying on the Quran for healing is an effective strategy. The collaboration of this finding reveals the need to ensure adequate palliative healthcare awareness to the Somali community.

4.4.6: Study Hypothesis and variables

After the analysis of the phase one study, this revealed that there exists a positive statistically significant relationship between cancer prevalence and pain management (p-value <0.05) hence null hypothesis is rejected. Similarly, the study also found that there exists a positive statistically significant relationship between the effects of cancer pain and pain management (p-value < 0.05) and thus the null hypothesis is also rejected.

A regression analysis between variables was conducted to establish the level of relationship between cancer pain management, cancer pain prevalence, and effects of cancer pain. The findings show an adjusted R-value of (0.898), meaning, (89.8%) of variability in pain management effects of cancer pain and cancer pain prevalence. The Analysis of Variance (ANOVA) was also conducted to establish whether there existed

significant variance in the means of between pain management, effects of cancer pain, and pain prevalence, $F_{(2, 91)} = 4.622$; (p-value < 0.05) meaning the mean difference between the variables was statistically significant.

4.4.7: Focus Group Discussion

Content analysis was utilised. Notes were concurrently by the focus group moderator about the topics under discussion, and the audio recordings were transcribed afterwards. Analysis of the transcripts started soon after the first focus groups were conducted, and this was continuous as additional focus groups were concluded. A data immersion approach was utilised. Moderator and another investigator read and re-read the transcripts independently to conduct open coding and conversation frequently to establish the definition of each issue discussed for the coding system. We also identified participants' quotes and grouped them

We combined what was discussed in each focus group and created categories and came up with consensus afterwards. The topic of discussion was cancer pain management, and we divided the subtopics into a) patient awareness of their condition b) participants experience of pain and its intensity, c) intervention they carry out to manage their pain and d) what can be done to improve their pain control. We listened to the audio and conducted text searches on transcripts in order to obtain synonyms keywords in the participants' quotations for the discussed topic. The search was to ensure that all quotations were identified and checked for similarities. We listened again and again and reread the transcripts to ensure that we represented the context accurately.

Participant interaction and sharing of their problem are one of the advantages of focus groups compared to individual interviews consisting of 5 to 6 participants provided

dynamic information. We looked at the encouraging words the participant's said to each other, facial and observable expression and behaviours during the discussion.

A total of 15 (5 participants in each group) participants attended the face to face focus group discussion of this study, comprising of 6 men and nine females. Three sessions was conducted in order to get saturation, and the following themes were identified

- Majority of patients who were of Somalis ethnic did not mention their clinical diagnosis 'cancer' and labelled their diagnosis as 'XANNUN' throughout our discussion which means in Somali language pain or any illness. However, the non-Somali patients could openly mentioned the word cancer as their diagnosis.
- Participant graded their pain as moderate to severe. Most of them were taking non-opioids like Paracetamol or Aspirin, and the few of the participants were taking opioids like morphine. However, the participants seemed not to understand the correct dose and frequency for their medications (outpatient) and the inpatient were reluctant to ask for pain medication because they did not want to bother the health workers in the ward. The pain medications were not accessible to most of the participants since they were not Garissa town and they had to travel from long a distance to get their medication (from ijara, modogashi, Lagdera, Tana River, Kitui, Daddab and Fafi)
- They believe their pain is due to their diagnosis and pain has affected all aspects of their life that include: routine work, general activities, walking, mood, sleep and sometimes their relationship with others.
- Alternative therapy used by most participants was Quran reading, and they believed that it relieved their pain. They also listed some herbal drinks that helped them relieve their pain plus other symptoms of cancer disease. Somali herbs such as

'*Malmal*' known comiphoramyrra, *'huruud'* Turmeric, *'qorfe'* Cinnamon, '*hulbad'* Fenugreek, 'sinjibiil' Ginger, '*filfil'* Black pepper, 'Likke'(the root of the tree crashed to form powder Diinsi). According to Alebi and Mehamed (2016)study, over forty-seven medicinal plant species of 23 families were revealed by the traditional healers of Somali –Ethiopia for the treatment of various human illness

- Participants perceived that their pain is not managed appropriately in their institution. Most participants mentioned the challenges of cancer pain management are inaccessible pain medications because they have to travel long for medication. Participants also perceive that nursing staff do not understand their pain and there are limited staffs in the palliative clinic who can attend to their need.

4.4.8: "Xanuun" nursing care model for cancer pain management

The findings of phase two of the study deal with testing of 'Xannun' nursing care model that was derived from gaps identified in phase one of the study. 'Xannun' nursing care model was then subjected to a test to see whether it can be implemented at GCRH. Questionnaires were administered to 10 participants consisting of 5 nurse consultants teaching in various universities in Kenya who are expert in the model development and five nurse managers working at GCRH. The result of their comments and inputs regarding the model was then adapted. Questionnaires sent to the experts contained both closed ended and open-ended questions and were descriptively analysed. Some participants' quotes were also adopted.

The majority (80%) supported that 'Xannun' nursing care model captured the challenges of cancer pain management. Very few participants, 20% felt that the model did not capture the challenges. The majority (60%) of respondents noted that nurses can

understand the model and 80% agreed that the language used on the model was clear and communicates to the nurses. On whether the model will change to the care of cancer pain, all respondents (100%) agreed that the model would bring change in cancer pain and 100% of the respondents felt that the model should be implemented at Garissa County Referral Hospital. Subsequently, the majority (90%) of respondents noted that the model was well-designed to bring positive change in palliative care, 90% of suggested that the model will face changes during implantation at GCRH. Experts in this study suggested the follow challenges associated with the implantation of Xannun nursing care model for cancer pain management

- language barrier

  inadequate capacity of health care workers,
- inhibitive community cultural practices,
- limited or shortage of resources for cancer pain management
- inadequate model knowledge and inadequate staffing
- Lack of equipment necessary for the mobile palliative care

The experts further suggested, concrete implementation of the model requires:

- Palliative care that of a multidisciplinary approach to cancer pain care
- Sensitising, creating awareness and educating the community on the importance of palliative care and prevention strategy through community mobilisation.
- Lobbying for funds for implementation from county government, National government, and development partners,
- involvement of nurses in decisions towards implementation of Xannunn Nursing Care Model, or any other matter concerning cancer pain management

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter focuses on the study summary, conclusin and recommendation of the study. The main objectives have summarised, conclusion drawn from the study and outlined some recommendation to better manage cancer pain.

5.2: Study Summary

The primary objective of this study was to develop a "Xanuun" nursing care model of cancer pain management for adult patients. The following specific objectives guided this study: To determine the prevalence of cancer pain among adult patients at Garissa County Referral Hospital; to explore the social-cultural influences on cancer pain management practices by adult patients at Garissa County Referral Hospital; to establish the practices among nursing workforce utilizing recommended WHO pain management ladder at Garissa County Referral Hospital; and finally, the development of an appropriate "Xanuun" nursing care model for cancer pain management of adults patients at Garissa County Referral Hospital.

This study was carried out in GCRH which is situated in the central location of Garissa County. The population of the study was composed of 84 nurses working at GCRH, 94 cancer patients and ten key informants in phase one and ten experts in phase two study. This study utilised a mixed-method design which is both qualitative and quantitative research approaches. The study was carried out in two phases. Phase utilised a descriptive exploratory study design and data collected from adult cancer patients, nurses and other health workers at GCRH. In phase two of the study, a "Xanuun" nursing care model of cancer pain management for adult patients was developed. A purposive sampling technique was applied to select participants of the study for both nurses and patients. Questionnaires were used to collect data from nurses and key informants that include the doctors, clinical officers, nurse managers, pharmacists and procurement officers to ascertain their knowledge and practice on pain management and availability of pain medication at GCRH. Focus group discussions were used to collect data from patients. Descriptive statistics were used to analyse data for frequencies and percentages, while correlation and regressions were used to establish whether there was a relationship between cancer pain management, prevalence, and effects of cancer pain.

On the first specific objective on the prevalence of cancer pain, this study found a high prevalence of pain and the common types of cancer at Garissa County Referral Hospital. Prostate cancer is common among men aged 65 years and above, and breast cancer among women aged 65 years and above. Other forms of cancers that were prevalent included Oesophagus, Cervical, Kaposi Sarcoma, Stomach and Liver. This study has established that there is poor pain management among cancer patients that has been exacerbated by the fact that most patients have to travel long distances to access palliative care, lack of necessary transport to the hospital, while others could not access pain medication due the cost of drugs and their inaccessibility. Critically important, this study has also established that negative attitude towards treatment, poor transport system, nomadic lifestyle, cultural attitudes towards (health worker and patient), the inconsistency of pain medicine intake, and not following pain management instructions provided by the caregivers

On objective two, this study sought to establish the practices among nursing workforce utilising recommended WHO pain management ladder at Garissa County Referral Hospital. The findings show that majority of nurses do not have the WHO tool to assess patients pain, and as a result, they used verbal assessment, use a numeric scale and their fingers to examine a patient's pain. More so, the few respondents who indicated they had been trained on WHO pain assessment and management tool, the majority did not know to use the WHO tool. The low utilisation of WHO analgesic ladder for pain management was perhaps since most nurses had not been trained on the tool and demonstrated knowledge deficit. Similar to our study is Yildirim et al., (2008) study in Turkey on the knowledge and attitude of nurses in cancer pain management. Yildirim et al., (2008) found that nurses had a knowledge deficit and poor attitude towards cancer pain management. Thus, in inadequate staff training on pain management negatively affects GCRH ability to offer effective palliative care.

On objective three, this study finding sought to establish whether to explore the social-cultural influences on cancer pain management practices by adult patients at Garissa County Referral Hospital. The finding shows that patients relied on several mechanisms including religious practices such as reading the Quran and taking some herbal medication. Some of the alternative medicine listed by the FDGs included Somali herbs such as '*Malmal*' known comiphoramyrra , *'huruud'* Turmeric, *'qorfe'* Cinnamon, '*hulbad'* Fenugreek, 'sinjibiil' Ginger, '*filfil'* Black pepper, 'Likke'(root of the tree crashed to form powder Diinsi). Apart from relying on traditional herbal medicines, patients relied on heat and cold therapy, and in worse scenarios, some patients used hot metals. The effectiveness of the cultural and traditional methods of pain management was not established.

Suhami et al., (2015) study had established that in Islamic cultures, Islamic healing is commonly used as a treatment of choice. Muslim cancer patients are mostly influenced by their family and friends influence to adopt this form of alternative cure. Quran verses are mainly used as a method of healing by reading *du'a* and *Sunnah salat*. It also includes the combination of reading *du'a*, recitation of some verses of Quran, use of healing water, with the use of herbs. The Islamic healing pursues to assist patients health in both spiritual and physical need. Despite the advances in the modern treatment of cancer, this study has revealed that the Islamic healing practices continue to be accepted by cancer patients in Garissa, as it was in Malaysia under Suhami et al., (2015) study.

5.3: Conclusion

This study has established the high prevalence of cancer pain. Overall, this study concludes that women above the age of 65 years experiences more pain from breast cancer, while more men above 65 years' more pain from prostate cancer than any other

cancer. Men were more likely to experience physical social and psychological pain than female. The variability between men and female was however not statistically significant. Also, breast, stomach and prostate cancers were found to be the most prevalent and other prominent types of cancer at GCRH are Oesophagus, cervical, Kaposi Sarcoma and liver. This study concludes that patients at GCRH do not receive adequate and efficient palliative care due to both patient-related factors such as long distances that patient to travel to access Medicare/medicine, lack of transport for patient, cost of drugs and accessibility, negative attitude towards treatment, poor transport system, nomadic lifestyle, cultural attitudes towards (health worker and patient), inconsistency of pain medicine intake, and not following pain management instructions provided by the caregivers. Institution-related factors were also identified such as the inadequate supply of pain management medication, lack of pain assessment tools for nurses, lack of pain management guidelines and policies and poor specialised training for nurses on palliative care. Cancer patients at GCRH are also nursed in general wards, and there are no special wards for cancer patients, thus less focus on cancer pain management.

This study also concludes that Quran, and taking some herbal medication, including the use of cold therapy, hot therapy and Somali herbs were some of the pain management mechanisms adopted by patients. The used of Quran for healing cancer pain is grounded from Islamic beliefs. The Quran can be used to treat all manner of ailment. Quran recitation or Quran reading is believed to control pain as most patients believe that Quran is the word of Allah. Equally, the provision of *duas* in the Quran provides the patients with the words of the prophet that they can pray for healing. Therefore the use of alternative palliative care is not out of arrogant ignorance, but out of cultural beliefs that healing can be divine intervention.

This study sought to establish the practices among nursing workforce utilising recommended WHO pain management and found that the majority of nurses do not have WHO tool to assess patients pain. Majority of the nurses do not know how to use the WHO tool. The study concludes deficit of knowledge on cancer pain management in line with WHO recommendations. Nurses did not use standard tool for pain assessment, and they limited training on the use of the pain assessment and management tools. In the case where patients have been trained, the training has not been practical.

This study subsequently developed a model known as 'Xannun' nursing care model for cancer pain management from the gaps identified in phase one of this study. This model was then subjected to test in phase two of this study. Expert opinion was sorted from five nurse consultants from various university and five nurse managers at Garissa county referral hospital regarding the implementation of 'Xannun' nursing care model. According to participants 'Xannun, ' nursing care model will provide a positive impact on cancer pain care however it may face some potential challenges. The main challenges emerging from the findings include language barrier, inadequate training of health care workers, inhibitive community cultural practices, limited or shortage of resources for cancer pain management, inadequate model knowledge and inadequate staffing

The experts further suggested the possible solutions to the challenges of model implementation. Such as:

- Translation of the model into local language for better community participation
- Training of health care workers on the model,
- Equipping GCRH with necessary oncology and palliative care equipment,
- Setting up a multidisciplinary team approach to cancer pain care
- Educating the community on the importance of palliative care

- Lobbying for funds from County and National government and development partners to implement the model
- Actively involve nurses in decisions making towards implementation of Xannunn Nursing Care Model for cancer pain management.

5.4: Recommendations

Recommendations for this study are presented for each research objective. The first objective sought to establish the prevalence of cancer pain among cancer patients at Garissa County Referral Hospital. This study has established that the most prevalent form of cancer is prostate cancer, while the most widespread pain is physical, psychological, and social pain. For women, this study found that the most prevalent cancer is breast cancer, and the most widespread pain is also a physical, psychological, social and spiritual pain. Therefore, this study recommends as follows:

- Healthcare centres should place more emphasis on screening men over the age of 40 for prostate cancer and women over the age of 40 for breast cancer. The earlier screening will increase the probability of diagnosing cancer at earlier stages and therefore easy to treat than advanced stages. the public should also be taught on the importance of cancer screening and also palliative care for those nursing cancer patients
    - For objective three on social-cultural influences on cancer pain management practices by adult patients, this study found that cancer patients at GCRH relied do rely on herbal medicine, religious and cultural practices to cure their cancer. This cultural belief can be a hindrance to effective cancer pain management. Therefore, this study recommends that:

- In as much as cultural and religious practices are integral parts of patients, reliance on alternative medicine as a form of palliative care is detrimental to patients care. Patients should be able to use the Quran as a source of divine healing, but at the same time, seek specialised palliative care offered in hospitals.
    - For objective three that sought to establish the practices among nursing workforce utilising recommended WHO pain management ladder, the study findings have revealed the existence of poor nurse training on the utilisation of WHO ladder on pain management, and recommends that:
- There is a need for enhanced training of nurses on palliative care in collaboration with the ministry of health. Emphasis should be placed on continuous retraining of health care workers on how to use the WHO palliative care tool or perhaps a review of their basic training curriculum to ensure that adequate time is allocated for palliative training. In addition to training health care workers, the hospital should develop policies and guidelines in line with WHO pain management and encourage the use standardised pain assessment tool and WHO analgesic ladder.
- Hospitals offering palliative care should have enough health care workers. A limited number of nurses and doctors at health care institutions make it difficult for the institutions to focus on palliative care.
- Cancer centre that encourages research should be set up for early diagnosis and screening
- Close monitoring of cancer patients should be enhanced to ensure patients are taking the right medicine for their level of pain. Continuous training patients to develop self-care strategy of pain management.

- Psychological counselling should be included in palliative care to ensure that patients are undergoing psychological pain due to cancer. Apparent GCRH has no psychologist to offer counselling in the palliative clinic.
- There is a need to expand the palliative clinic and ensure a multidisciplinary approach to pain care and other symptoms of cancer and development of mobile clinic for cancer pain management
- There is a need to initiate mobile clinics in this area to avoid inaccessibility of pain medication in the remote areas of Garissa county
- Development of hospital policy that ensures the use of pain management guideline and interpretations of a component of the palliative care in daily clinical services for all cancer patients and other non-communicable diseases.

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APPENDICES

Appendix 1: Consent Explanation

Topic: MODEL OF NURSING CARE FOR CANCER PAIN MANAGEMENT AMONG ADULT PATIENTS AT GARISSA COUNTY REFERRAL HOSPITAL (GCRH)

My name is Fatuma Aden Affey; I am a student doing PhD in Nursing at Mount Kenya University and currently undertaking a study on the above topic.

The primary objective of this study is to recommend the development of a model of nursing care for pain management among the adult patients at GCRH. Please understand that there are no risks or harm to you either physically or psychologically known to the researcher that you may sustain in this study. However, you may spend your valuable time to take part in the study with no monetary gain. The information provided will be held confidential and will not be used to trace. Participation in this study will not in any way influence the care you are currently receiving instead this study will benefit you by contributing to the improvement of care in pain management in this institution and community at large. Thanks for your voluntary participation,

Signature…….

FATUMA A. Affey: Cell Phone 0722731306

Consent Form: Participant

I have read and understood the explanation given for the study, and I am willing to participate / not willing to participate. I have not been coerced or offered any monetary gain to participate in this study.

Signature…… Date……

Appendix 2: Sample of a Questionnaire to be Filled by Nurses Caring for Cancer Patients

QUESTIONNAIRE NO……

TITLE: MODEL OF NURSING CARE FOR PAIN MANAGEMENT AMONG ADULT PATIENTS WITH CANCER AT GARISSA COUNTY REFERRAL HOSPITAL (GCRH)

INSTRUCTIONS:

i) Do not write your name on this questionnaire.

ii) The information given is meant for study purposes only and shall be treated in confidence.

1. What is your current level of nursing education?

1) Certificate ☐ 2) diploma☐ 3) Higher Diploma☐ 4) Degree☐ 5) masters and above☐

2. How long have you been working as a nurse?
3. Of the following types of cancers on scale of 1- 5 pick the type you have nursed most frequently in last 5 years

   ☐ Oesophagus

   ☐ Cervical

   ☐ Breast

   ☐ Prostate

   ☐ Kaposi sarcoma

   ☐ Others specify--------

4. Have you ever assessed pain of Adult patient with cancer?

   A) Yes ☐ B) No ☐

5. Which tool of cancer pain assessment have you used……

6. Do you prescribe any pain relieve medication for a patient with cancer?

a) Yes ☐ b) No ☐

7. If No, do you administer any pain relieve medication for patient with cancer?

a) Yes ☐ b) No ☐

8. In assessing pain of cancer patients, which of the following best describe your practice situation?

A) Presence of an assessment tool ☐ B) absence of an assessment tool ☐

C) Adequate knowledge in pain assessment ☐ D) inadequate knowledge in pain ☐

E) Both A& C ☐ F) Both A& D ☐ G) B&C ☐ H) others, specify…….

9. Have you done any short course on pain management?

Yes ☐ b) No ☐

10. If you have attended the above course/training, do you utilize the guidelines of pain medication of adult cancer pain by WHO?

a) Yes ☐ b) No ☐

11. If your answer in question no.11 is No, why is it not possible to use pain management medication guideline of cancer patients?

……

……

……

12. In your experience, which of the following best describes pain management of cancer patients in your facility?

A) Present of medication to control pain ☐ B) absence of medication to control pain ☐

C) Sufficient specialized staff on pain care ☐ D) insufficient specialized staff on pain care ☐

E) Present of specific unit to care for cancer patients ☐

F) Absence of specific to care for cancer patients ☐

G) Others specify ……

13. From your experience, how will you best describe your patient's perception of cancer pain management in your facility

14. From your experience, what do you suggest will enhance adequate cancer pain management in your facility?

15. From your experience, what do you suggest will hinder adequate cancer pain management in your facility?

Appendix 3: Sample of a Questionnaire to be Filled by Patients with Cancer

My name is Fatuma Aden, a student pursuing PhD in Nursing at Mount Kenya University. This questionnaire is for a study purpose only and I Am kindly requesting for your support in order to gather information for my study.

Title: **MODEL OF NURSING CARE FOR PAIN MANAGEMENT AMONG ADULT PATIENTS WITH CANCER AT GARISSA COUNTY REFFERAL HOSPITAL (GCRH)**

QUESTIONNAIRE NO…….

INSTRUCTIONS:

i) Do not write your name on this questionnaire.

ii) The information given is meant for study purposes and shall be treated in confidence.

PATIENT PROFILE

1. Gender a) Male ☐ b) female ☐
2. Age……..
3. Ethnic Background…a) Somali ☐ b) Non Somali ☐
4. Marital status
   a) Single ☐ b) Married ☐ c) divorced ☐ d) widowed ☐..
5. Educational Background

a) Primary level ☐ b) secondary ☐ c) tertiary ☐ d) no formal education ☐

6. What is your monthly Income
   - **a.** Below Kes 23,670 ☐
   - **b.** Between Kes 23,671 and 120,000 ☐
   - **c.** Above Kes 120,000 ☐
7. Are you informed about the type of cancer you have?
   a) Yes ☐ b) No ☐ c) uncertain ☐

8 What type of cancer condition do you have?

- Oesophagus
- Cervical

- Breast
- Prostate
- Kaposi sarcoma

Others specify…

9. How long has it been since you first learned your diagnosis ……? months
10. Have you ever had pain due to your present disease?

    a) Yes ☐ b) No ☐ c) uncertain ☐

11. Was pain one of your symptoms, when you first received your diagnosis?

    a) Yes ☐ b) No ☐ c) uncertain ☐

12. In your experience of pain, which of following best describes how you feel?

a) Helpless & anger of diagnosis ☐ b) actual body pain

c) Worry about well-being of my family ☐

d) Why does God allow me to go through this? ☐

e) Others specify …….

13. Have you had any surgery in the last one month a) Yes ☐ b) No ☐

    If yes, what type of surgery …….

14. In our daily lives, most of us have had pain from time to time, (like sprains, headache, toothache, general body pain). Have you had pain other than these everyday pains during the last week?

    a) Yes ☐ b) No ☐

15. If yes, how often do you experience such pain in a day? (Please tick one)

- Once daily
- Twice daily
- Three times

 Others specify ……

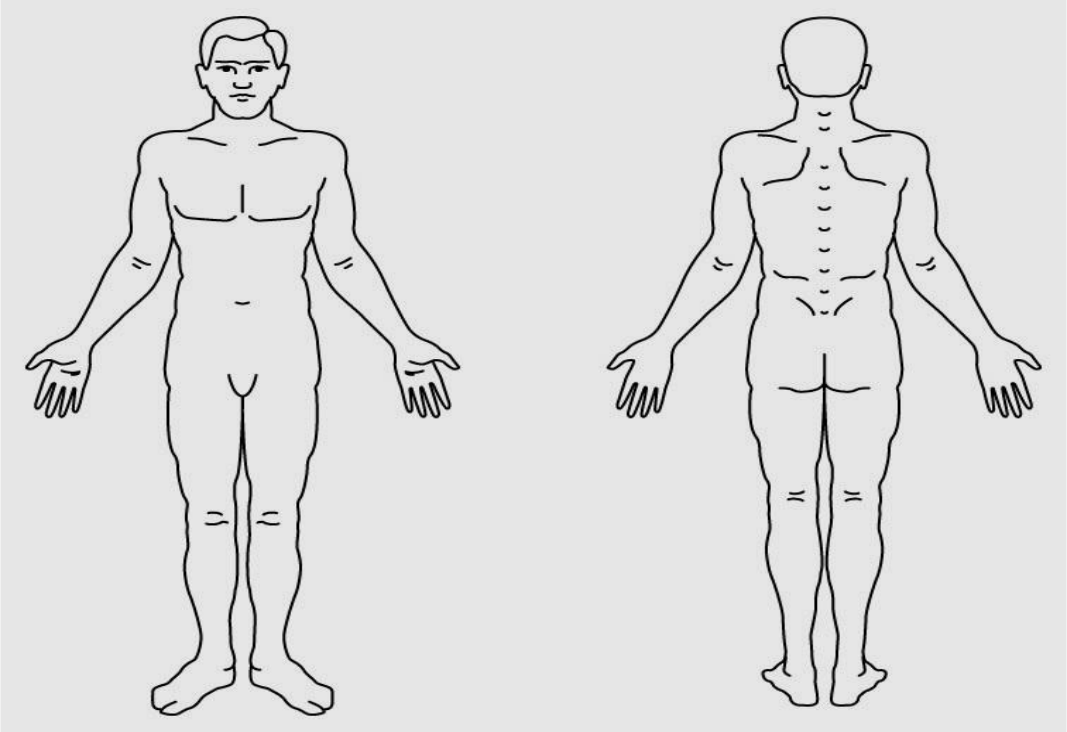
16. Have you taken any pain medication in the last 7days

a) Yes ☐ b) No ☐

17. if yes, do you require this medication every day

a) Yes ☐ b) No ☐

18. Please shade on the diagram where you feel pain on. Put X area that hurts most



19. Please rate your pain by circling a number that best describes your pain at its **worst** in the last week (0- No pain , 1-3 mild pain, 4-6 moderate and 7-10 severe pain)

0 1 2 3 4 5 6 7 8 9 10

No pain pain as bad you can imagine

20. Please rate your pain by circling a number that best describes your pain at its **least** in the last week

0 1 2 3 4 5 6 7 8 9 10

No pain Pain as bad you can imagine

21. Please rate your pain by circling a number that best describes your pain on **average in** the last week

0 1 2 3 4 5 6 7 8 9 10

No pain pain as bad you can imagine

22. Please rate your pain by circling a number that best describes your pain **now**

0 1 2 3 4 5 6 7 8 9 10

No pain Pain as bad you can imagine

23. What kind of things do you take for pain that you feel better (e.g heat therapy, burning , medicine , rest, tradition herbs and Quran)

……

……

24. What kind of things makes your pain worst (e.g walking, standing, and lifting)?

……

……

25. What medication do you receive for pain relief (confirming the prescription with the patient) (Please tick only one category)

a) Aspirin/ Paracetamol / Acetaminophen, NSAID's &± *Adjutants*

b) Codeine/ Hydrocodone / Oxycodone / Dihydrocodeine /Tramadol &± *Adjuvants*

c) Morphine/ Hydromorphone /Methadone/ Levorphanol / Fentanyl/ Oxycodone &± *Adjuvants*

26. If you are not using any of the above categories of drugs, please specify others…....

27. In the last week, how much pain relief, have you received from the medication provided? Please circle the percentage that shows how much relief you received

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

No relief complete Relief

28. If you are taking medication from hospital (Q 25 above), are the drugs you are taking always available for you?

☐ Yes ☐ No

29. If you take pain medication, how often do you take the medication before pain returns?

a) Medication does not help me
b) one hour
c) two hours
d) Three hours
e) Four hours
f) Five hours
g) More than twelve hours
h) I do not take pain medication

30. Circle the number that describes how, during the past week pain has interfered with your

A) General activity

0 1 2 3 4 5 6 7 8 9 10

Does not Affect **completely affect**

B) Mood

0 1 2 3 4 5 6 7 8 9 10

Does not affect completely affect

C) Walking ability

0 2 3 4 5 6 7 8 9 10

Does not affect completely affect

D) **Sleep**

0 2 3 4 5 6 7 8 9 10

Does not affect completely affect

E) Normal work

0 2 3 4 5 6 7 8 9 10

Does not affect completely affect

f) Relationship with Others

0 2 3 4 5 6 7 8 9 10

Does not affect completely affect

31. Do you feel the pain you are experiencing is adequately managed?

a) Yes b) No c) uncertain

32. Do you believe your current pain is due to? (check appropriate answer for each item)

a) The effect of treatment (e.g medication, surgery , radiation e.tc)

Yes ☐ or NO ☐

b) My primary disease(cancer disease)

Yes ☐ or NO ☐

c) A medical condition unrelated to the cancer disease I have (arthritis)

Yes ☐ or NO ☐

33. Please describe the condition…….

34. Suggest what support you are getting that enables you adequately manage pain?

Please specify……

Appendix 4: Sample Focus Group Discussion Guide for the Study

TOPIC: Focus group discussion on cancer pain management- Garissa County Referral Hospital

Preparation Phase of Focus group discussion

Before the focus group session commences the researcher will prepare the following materials that are required for the process:

1. Consent forms that will be completed by the participant and one general consent for the whole team
2. Participant sign-in sheet
3. Evaluation sheets for each participant
4. Stationeries such as Pads and pencils for each participant who can write English, Swahili or Somali. Permanent marker for marking the tapes –name, facility, date & time. Note book for taking notes during discussion
5. Focus group discussion guide
6. One recording tape
7. Extra batteries & recording device for emergency use
8. Refreshment for the respondents like sodas/tea and snacks

THE PROCESS: INTRODUCTION PHASE

All members will be Welcomed and appreciated for participating in the focus group discussion.

The moderator will introduce herself:

My name is Fatuma Aden, a student pursuing PhD in Nursing at Mount Kenya University. This focus group discussion is for a study purpose and I am kindly

requesting for your support in order to gather information for my study. The note-taker is also introduced by the moderator. Then the Sign-In Sheet with some few demographic questions (age, gender, type of cancer & type of pain) will be circulated around the group while moderator introduces the focus group. The very important questions which need to be reviewed by the moderator at the introduction phase are:

- Who are the respondents (cancer patients)? What is our purpose of meeting?(to collect data for study)
- What will be done with this information after the group discussion (Confidentiality will be maintained)? How long will the Focus group discussion last? (About one hour)
- Are the group members allowed move around? (yes -Feel free to move around)
- Group orientation to where the bathroom will be shown (ladies &gents at the Exit door) Where the refreshments will be available (e.g right corner the ward entrance)
- The group will be asked to suggest ground Rules

After brainstorming some ground rules with the group will be developed and hence the moderator will ensure sure that:

- Everyone should participate in the discussion.
- Information collected in this focus group discussion must be kept confidential
- Moderator will avoid side conversations and Stay with the group
- All members will Turn off cell phones if possible

After introduction phase & ground rules are set, then the moderator will commence the session with the following questions and ensuring to turn on the Tape Recorder and alerting the note- taker to be ready.

ENGAGEMENT QUESTIONS:

1. What do you know of your current condition?
2. May you be aware of your?
3. What factors influence the pain your experience (what aggravate or relief your pain)
4. When do you feel your pain most during the day, when relaxing or doing activities? Does it current diagnosed?
5. What do you think of your condition in relation to the pain you are experiencing?

EXPLORATION QUESTIONS

6. What kind of pain do you experience affect your daily chore
7. How do you rate your pain in account of 1 to 10, where 0-1 is no pain, 2 -3 mild pain, 4-5moderate while 7-10 is severe pain
8. Do you take any medication to relief your pain? Yes: How often do you take them? What is the dose you are taking, does it work for you and are the medication always available for you?
9. No (Q 7) what do you take your pain relieve and why
10. Might you be familiar with the names of the drugs you are taking? If yes please could tell us(check patient record)
11. Apart from medication what other activities or traditional herb do you think can control your pain
12. What challenges do you face in your pain management
13. What do you think can help manage your cancer pain in this institution?

EXIT QUESTION:

14. Is there anything else you would like to say about cancer pain management in GCRH

NOTE

During discussion the moderator will ensure that people are given time to think before answering the questions. Probing questions are used to ensure that all relevant information is collected. Moderator will only move on when she hears on when repetitive information

Appendix 5: Sample of Knowledge and Attitudes Survey on Cancer Pain to Key Informants (Health Workers)

Part A

1. What is your qualification?

a) Medical doctor (manager) ☐ b) nurse manager ☐ c) pharmacist ☐

2. How long have you worked at GCRH?

Less than 1year ☐ b) 1- 3years ☐ c) 3- 6 years ☐ d) more than 6 years ☐

3. Have you taken care of cancer patient?

Yes ☐ a) NO ☐

4. What are the most common cancers pain medications available at GCRH?

5. Have been trained on cancer pain management/ palliative care?

Yes ☐ b) No ☐

6. Do you know the medication of pain management

Yes ☐ b) No ☐

a) If yes, have you supplied any of those medications to a cancer patient?

Yes ☐ No ☐

b) Have you administered those medications to cancer patients?

Yes ☐ No ☐

c) Have you prescribed those medications to cancer patients?

Yes ☐ No ☐

7. Are these medications always available at GCRH?

   ☐Always ☐Never available ☐sometimes available

8. If never available or sometimes why are they not available?
9. If not available, what else do administer/ prescribe/ supplied for cancer pain control?
10. What is your assessment of pain management in your institution
11. What can be done to improve cancer pain management in your institutions or your county at large?

Appendix 6: Eastern Cooperative Oncology Group (ECOG) Performance Status scoring system for Cancer patients' physical activities adapted from Malalasekera et al,. (2016)

	ECOG PERFORMANCE STATUS
Grade	ECOG
0	Fully active, able to carry on all pre-disease performance without restriction
1	Restricted in physically strenuous activity but ambulatory and able to carry out work of a light or sedentary nature, e.g., light house work, office work
2	Ambulatory and capable of all self-care but unable to carry out any work activities. Up and about more than 50% of waking hours
3	Capable of only limited self-care, confined bed or chair more than 50% of waking hours
4	Completely disabled. Cannot carry on any self-care. Totally confined to bed or chair
5	Dead

Appendix 7: Sample Xannun Model Testing Questionnaire

a) Does this '*Xannun*' model capture the challenges of cancer pain management?

☐ Yes ☐ No

b) If no, please state why……..

a) In your opinion, are nurses able to understand how to use this model?

☐ Yes ☐ No

c) If no, state why…….

a). Is the language used in the model clear and does it communicate to the nurses?

☐ Yes ☐ No

b). If no, state why ……...

a). In your opinion, do you this model will bring any change in the care of cancer pain?

☐ Yes ☐ No

b). If no please state why…….

5.

a). Do you think this model be implemented in Garissa County Referral Hospital? (GCRH)

☐ Yes ☐ No

b). If no please state why…….

6.

a). Do you think the implementation of this model of care can bring a positive change in the care of patients with cancer pain?

☐ Yes ☐ No

b). If no, please state

why……

……

……

7

a). Do you think there are any challenges in implementing such a care model?

☐ Yes ☐ No

b). If yes, state any challenges of implementing such a care model……

……

……

……

……

a) How do you think these challenges can be addressed for better pain care

……

……

……

……

…

Appendix 8: Certificate of Ethical Clearance

Mount Kenya University

MARCH 30, 2017

Ref. No. MKU/ERC/0350

CERTIFICATE OF ETHICAL CLEARANCE

This is to certify that the proposal titled **"TO DEVELOP A MODEL OF NURSING CARE FOR CANCER PAIN MANAGEMENT AMONG ADULT PATIENTS AT GARISSA COUNTY REFERRAL HOSPITAL"**, whose Principal Investigator is Ms Fatuma Aden Affey (PhDN/2014/70804) has been reviewed by Mount Kenya University Ethics Review Committee (ERC), and found to adequately address all ethical concerns.

Mr Francis W. Makokha
Secretary, Mount Kenya University ERC

Sign: _____ **Date:** 30.03.2017

Prof. Francis W. Muregi
Chairman, Mount Kenya University ERC

Sign: _____ **Date:** 03.04.2017

The Chairman
Mount Kenya University
Ethics Review Committee
P. O. Box 342 - 0100, Thika

Appendix 9: Introduction Letter

Mount Kenya University

SCHOOL OF POSTGRADUATE STUDIES

REF: PHDN/2014/70804

6th April, 2017

The Director, Research Coordination Division
National Commission for Science, Technology & Innovation a
Utalii House, 8th & 9th Floor
P.O Box 30623- 00100
Nairobi

Dear Sir/ Madam,

RE: FATUMA ADEN AFFEY - REGISTRATION NO. PHDN/2014/70804

The purpose of this letter is to introduce the above named student who is pursuing **PhD in Nursing Science - Oncology & Palliative Care Nursing** in the Department of **Medical - Surgical Nursing** in the School of **Nursing.**

The title of his Thesis is *"To Develop a Model of Nursing Care for Cancer pain Management among Adult Patents at Garissa County Referral Hospital."*

She has been cleared by the University's Ethics Review Committee (certificate attached) and now has to proceed to the field to collect data for her research in the course of this semester **(April 2017 - June 2018).**

Any assistance accorded to her will be highly appreciated.

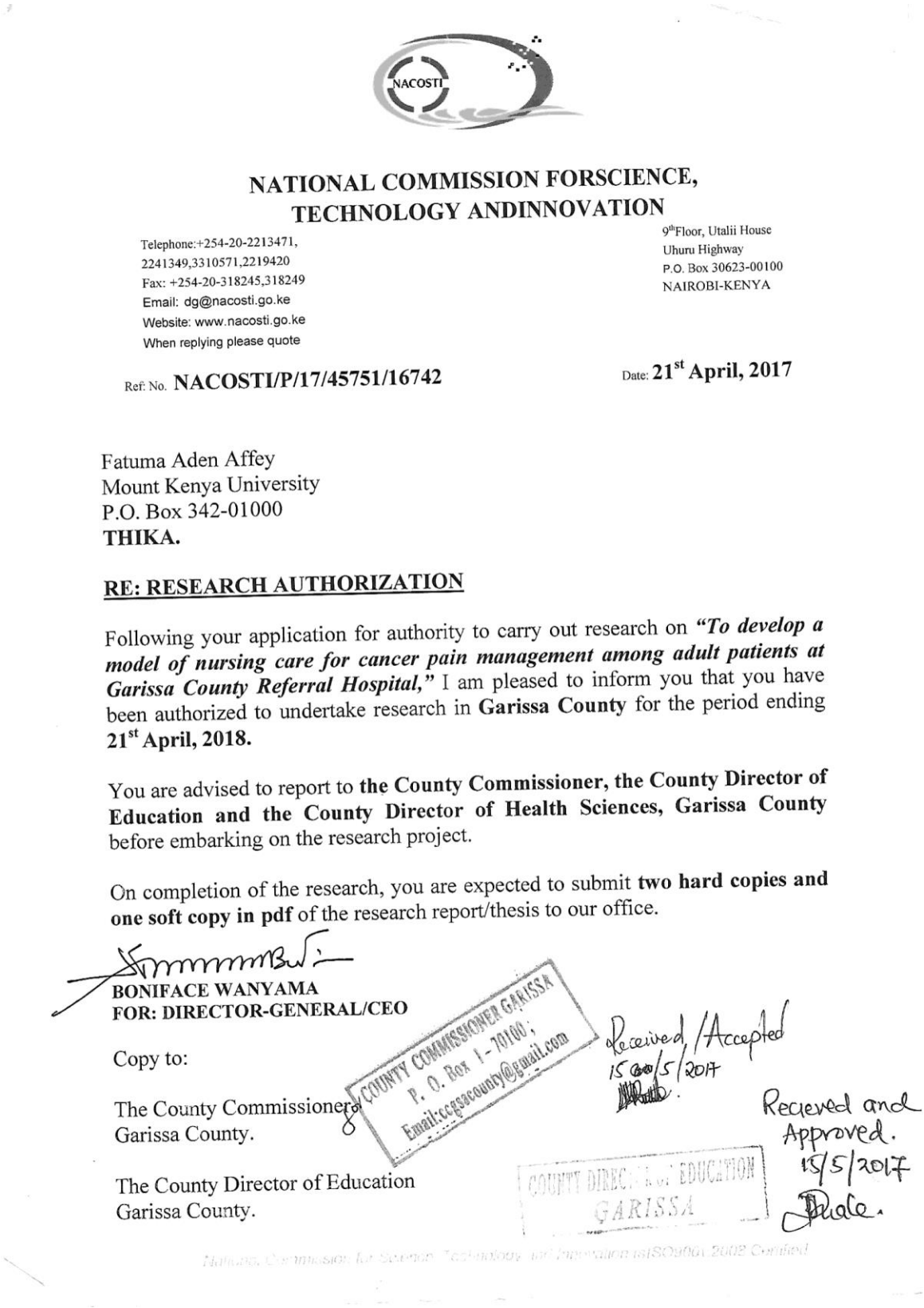
Thank you.

Mount Kenya University
Dean, School of Postgraduate Studies
P. O. Box 342 - 01000
Thika

Dr. Samuel Karanga
Dean, School of Postgraduate Studies

Enc

Appendix 10: Research Authorization Letter



NACOSTI

NATIONAL COMMISSION FORSCIENCE, TECHNOLOGY ANDINNOVATION

Telephone:+254-20-2213471,
2241349,3310571,2219420
Fax: +254-20-318245,318249
Email: dg@nacosti.go.ke
Website: www.nacosti.go.ke
When replying please quote

9th Floor, Utalii House
Uhuru Highway
P.O. Box 30623-00100
NAIROBI-KENYA

Ref: No. **NACOSTI/P/17/45751/16742**

Date: **21st April, 2017**

Fatuma Aden Affey
Mount Kenya University
P.O. Box 342-01000
THIKA.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on ***"To develop a model of nursing care for cancer pain management among adult patients at Garissa County Referral Hospital,"*** I am pleased to inform you that you have been authorized to undertake research in **Garissa County** for the period ending **21st April, 2018.**

You are advised to report to **the County Commissioner, the County Director of Education and the County Director of Health Sciences, Garissa County** before embarking on the research project.

On completion of the research, you are expected to submit **two hard copies and one soft copy in pdf** of the research report/thesis to our office.

BONIFACE WANYAMA
FOR: DIRECTOR-GENERAL/CEO

COUNTY COMMISSIONER GARISSA
P. O. Box 1-70100,
Email:ccgsacounty@gmail.com

Received/Accepted
15/5/2017

Copy to:

The County Commissioner
Garissa County.

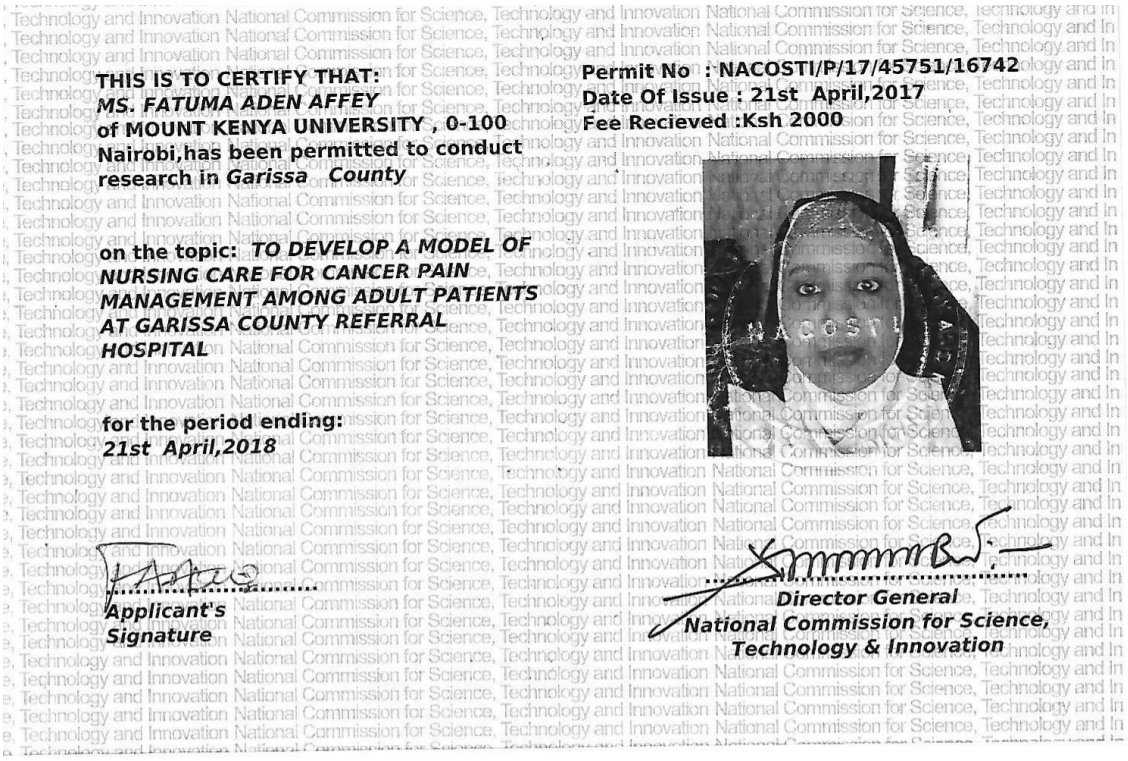
Recieved and Approved.
15/5/2017

COUNTY DIRECTOR OF EDUCATION
GARISSA

The County Director of Education
Garissa County.

National Commission for Science, Technology and Innovation is ISO9001:2008 Certified

Appendix 11: Research Permit



THIS IS TO CERTIFY THAT:
MS. FATUMA ADEN AFFEY
of MOUNT KENYA UNIVERSITY , 0-100
Nairobi,has been permitted to conduct
research in *Garissa County*

on the topic: *TO DEVELOP A MODEL OF NURSING CARE FOR CANCER PAIN MANAGEMENT AMONG ADULT PATIENTS AT GARISSA COUNTY REFERRAL HOSPITAL*

for the period ending:
21st April,2018

Permit No : NACOSTI/P/17/45751/16742
Date Of Issue : 21st April,2017
Fee Recieved :Ksh 2000

.....
Applicant's Signature

.....
Director General
National Commission for Science, Technology & Innovation

Appendix 12: Map of Garissa County Referral Hospital