PAIN MANAGEMENT OF CANCER PATIENTS IN AHMADU BELLO UNIVERSITY TEACHING HOSPITAL SHIKA-ZARIA

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DECLARATION

I declare that the work in the thesis entitled 'Pain management of cancer patients in Ahmadu Bello University Teaching Hospital Shika-Zaria' has been performed by me in the Department of Pharmacology and Clinical Pharmacy under the supervision of Prof. I. Abdu-Aguye, Dr. J.A. Anuka and Dr. T.A. Olasinde.

The information derived from the literature has been duly acknowledged in the text and a list of references provided. No part of this thesis was previously presented for another degree or diploma at any university.

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CERTIFICATION

This thesis entitled "PAIN MANAGEMENT OF CANCER PATIENTS IN AHMADU BELLO UNIVERSITY TEACHING HOSPITAL SHIKA-ZARIA" by Yerima Musa meets the regulations governing the award of Master of Science degree of Ahmadu Bello University, Zaria, and is approved for its contribution to knowledge and literary presentation.

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ABSTRACT

The number of cancer patients in the world is increasing. Of the estimated nine million new cases every year, more than half are in developing countries. The majority of these patients are incurable by the time their diseases are diagnosed. Approximately one third of the people who are actively receiving treatment for cancer and two thirds of those with advanced malignant diseases experience pain. Almost 75% of patients with advanced cancers that are admitted to the hospital report pain upon admission.

This study was conducted to describe the pattern of cancer pain in patients, describe pattern of drug use and cost implication of cancer pain management and to describe the common types of cancer in patients attending the Oncology and Radiotherapy clinic of ABUTH. The study also investigated the knowledge of Health Care Professionals (Doctors, Nurses and Pharmacist) on the use of prescription pain medication. The study was a prospective and retrospective one, involving two hundred and sixty (260) patients attending the clinic at the Department of Oncology and Radiotherapy ABUTH, a visual analogue scale was used to measure pain before and during therapy. The study was conducted using a structured questionnaire and it had a scope of one year: (January to December 2005). Patients were interviewed in the Oncology clinic, the Radiotherapy room and the chemotherapy ward.

Cervical and breast cancers are the most prevalent cancer types at the clinic. One hundred and seventy eight (79%) of the patients were married and 135 (82%) of the women are housewives. More than half do not have a family history of cancer, and about 64% of the patients have no any form of western education.

The patients experiencing pain after initiation of therapy, 15% of them use Diclofenac for the relief of their pain. The most commonly used antineoplastic agents in the clinic were 5-flourouracil, doxorubucin hydrochloride and cyclophosphamide. Dexamathasone is the most frequent adjuvant drug used.

Patients described their pain as being present every day, but the pain was not constant. Patients also communicated that the pain was present mostly at night but did not prevent them from sleeping.

The patients also reported a remarkable decrease in the level of their pain, as most of them initially complained of severe pain, before the initiation of therapy and after the initiation of therapy, only mild pain was experienced.

For patients whose records were seen (out of the 260), the total cost of managing cancer pain in the patients was approximately ₦16,347,125:00 (sixteen million three hundred and forty seven thousand one hundred and twenty five). This covers direct costs only, involving cost of laboratory investigations, surgery, radiotherapy, analgesics and chemotherapy.

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CHAPTER ONE

1.0 INTRODUCTION

Cancer is a chronic progressive, life-limiting disease, which brings a host of difficult symptoms, including pain, dyspnoea, fatigue, and loss of mobility. Cancer is always accompanied by depression, anxiety, and a sense of uselessness (Fine, 2005).

The number of cancer patients in the world is increasing. Of the estimated nine million new cancer cases every year, more than half are in the developing countries. The majority of these patients are incurable by the time their disease is diagnosed (World Health Organization, 1996).

Apart from death, cancer patients' greatest fear is often pain or the anticipation of pain. Pain is the most common symptom experienced by patients with cancer. Various types of cancer pain exist, and the level of pain intensity often determines the patient's physical and emotional status. Studies have indicated that even though pain is controllable in seventy to ninety percent of patients, often it is left uncontrolled (Von Roenn et al 1993, Cherny and Portenoy 1993, Portenoy 1995, O'Neill 1996). These studies also show that patients and physicians cite potential addiction to pain medication, development of drug tolerance, and possible drug-related side effects as reasons for not controlling pain. Uncontrolled pain, however, can lead to a poorer quality of life not only for the patient, but also for the patient's family members as well.

Management of pain in cancer patients is still a significant problem in healthcare despite the fact that it can be controlled in approximately ninety percent of patients (Bitros, 2005). Bitros also showed that emotional, psychosocial, and spiritual sufferings associated with the disease complicate the problem. The end stage symptom of cancer is mostly severe pain (Ng and Von Gunten 1998; Caraceni and Weinstein 2001), thus uncontrolled pain diminishes quality of life. Patients experiencing pain often hesitate in participating in daily activities for fear of worsening their pain. Thus, social and family relationships may suffer as this avoidance behavior escalates (Bucher, *et al* 1999; Mystakidou, et al 2005). Effective pain management in advanced medical illness and at the end of life is a critical component of quality medical care to ensure a dignified, safe and comfortable dying.

The aim of treatment is to relieve pain to the patient's satisfaction, so that he or she can function effectively and eventually die free of pain (World Health Organization, 1996). Hence, the goals of therapy are "to achieve adequate pain relief safely within an acceptable time frame, to minimize the side effects of treatment and to provide ongoing analgesic therapy by the most convenient and least noxious means available"(Cherny et al 1995).

1.1 BARRIERS TO EFFECTIVE PAIN MANAGEMENT

Although numerous types of pain therapy are available, patients often suffer needlessly due to undertreatment. Known barriers to pain management include clinician-related factors such as uncertainty about the role of opioids; patient-related factors such as fear of opioid drugs and poor compliance; and other factors such as lack of supply and economic barriers.

(Portenoy R.K. and Coyle N. 1990, Von Roenn et al 1993, Cherny N.l. and Portenoy R.K. 1994.)

Clinician-Related Factors

Uncertainty about the role of opioid therapy

Patients with early disease

Patients with indolent metastatic disease

Patients with treatment-related pain

Under treatment

Caused by deficiencies in knowledge of analgesic pharmacotherapy

Caused by failure of assessment

Caused by overestimation of risks

· risk of adverse effects

· risk of addiction

· risk of tolerance

Caused by physician concern about regulation of controlled prescription drugs

Patient-Related Factors

Ineffectual pain reporting

1 caused by desire to focus on Treatment of tumor

2 Caused by stoicism

3 Caused by desire to please the staff

4 Caused by use of pain to follow course of disease

Fear of Opioid Drugs

Fear of adverse reactions

Fear of addiction

Fear of tolerance

Poor Compliance

Inability to comply with complicated program

Inadequate understanding of dosing guidelines

Other Factors

Non availability of opioids

Lack of adequately skilled clinicians

Pharmacies that fail to maintain opioid supply

Inadequate facilities for correct diagnosis

Economic

Non affordability of the opioids

Inaccessibility of the opioids

1.2 HYPOTHESIS

An effective pain control in end-stage cancer can improve quality of life in Tertiary Health Care System (Ahmadu Bello University Teaching Hospital Shika- Zaria, Nigeria).

1.3 SPECIFIC AIM OF THE STUDY

- To describe the pattern of cancer pain in patients attending Oncology and Radiotherapy clinic of ABUTH

1.4 OBJECTIVES OF THE STUDY

- To asses patients' satisfaction with regards to management of their pain
- To describe pattern of drug use and cost implication of cancer management
- To describe the common types of cancer in ABUTH
- To investigate the knowledge of Health care professionals on prescription of pain medications.

1.5 SIGNIFICANCE OF THIS STUDY

Approximately one third of the people who are actively receiving treatment for cancer and additional one third of those with advanced malignant disease experience pain (Chang *et al* 2000; Wells, 2000; Meuser et al 2001; Rabow, et al 2003).

It is important to acknowledge and address the prevalence, high incidence, and serious adverse consequences of pain in the end-stage conditions that affect patients with advanced medical illness, such as controlled and uncontrolled cancer.

2.0 CHAPTER TWO

2.1 LITERATURE REVIEW

Pain is an unpleasant sensory or emotional experience associated with actual or potential tissue damage or described in terms of such damage (International Association for the Study of Pain, 1987).

Pain is a complex clinical problem. Assessment depends on verbal report, and the patient's physical perception may be modified by cognitive and affective factors. The salience of pain as a problem in its own right has grown since 1945 and new therapeutic alternatives have developed from research and from new theoretical perspectives (Meldnum, 2003). Insomnia, fatigue, and anxiety may lower the pain threshold, whereas rest, sleep, pastoral counseling, and diversion can raise it (Bitros, 2005).

Pain is a subjective experience. Therefore, it is only the patient, not the clinician, nor a family member, who can describe the intensity of pain. "Pain is whatever the experiencing person says it is, existing wherever he/she says it does". Thus, a patient's description of pain must be believed if clinicians wish to alleviate their patient's discomfort (Koda-Kimble, 1992).

Treatment of chronic cancer pain is often difficult and frustrating because there is no specific formular for success or failure. However, alleviation of chronic cancer pain can be most rewarding because it offers instant gratification for both the patient and clinician. Much of the difficulty lies in the fact that many clinicians are not educated or trained in how to deal with the complex pharmacologic and psychosocial problems associated with chronic cancer pain. Drug selection is often irrational and doses are frequently inadequate. Unfortunately, clinicians occasionally withhold adequate analgesia because of a misunderstood fear of addiction (Hammond 1979; Porter 1980; Angell 1982; Weis et al 1983). Although opiate therapy has been a mainstay of pain control for many years, many

specialist presented information and research concerning novel delivery techniques, new opiate analogues, and management strategies that may provide significant improvements for both acute and chronic pain management (David and Caraway 2004).

Intrathecal infusions containing opiates have been widely used for more than 20 years to control cancer and chronic pain. This method takes advantage of the remarkable difference in dosages needed to achieve an equianalgesic effect among various routes of delivery. For example, morphine at a daily dose of 300mg orally and 100mg intravenously and 1mg intrathecally, all provide the same level of pain relief. This is a 300 - fold difference (oral vs. intrathecal) and explains why side effects are often much reduced with intrathecal delivery compared with other routes (David and Caraway 2004).

> Inplantable devices including fully programmable pumps are placed under the skin and maintain variable rates of infusion directly into cerebrospinal fluid through an indwelling subcutaneous catheter. Although these are widely used and have been demonstrated to be safe and effective, many different medications are in use, dosing strategies vary, and safety considerations for many of these medications have not been fully established.

2.2 TYPES OF PAIN

There are three types of pain, based on where in the body the pain is felt: somatic, visceral, and neuropathic. Pain of all three types can be either acute or chronic. Somatic, visceral, and neuropathic pain can all be felt at the same time or singly and at different times. Most cancer patients experience both somatic and visceral pain. Only about fifteen to twenty percent of all cancer patients report neuropathic pain. The different types of pain respond differently to the various pain management therapies. Somatic and visceral pains are both easier to manage than neuropathic pain.

2.2.1 Somatic Pain

Somatic pain is caused by the activation of pain receptors in either the cutaneous (skin surface) or deep tissues (musculoskeletal tissues). When it occurs in the musculoskeletal tissues, it is called deep somatic pain. Common causes of somatic cancer pain include metastasis in the bone (an example of deep somatic pain) and postsurgical pain from a surgical incision (an example of surface pain). Deep somatic pain is usually described as dull or aching but localized. Surface somatic pain is usually sharper and may have a burning or pricking quality.

2.2.2 Visceral Pain

"Viscera" refers to the internal areas of the body that are enclosed within a cavity. Visceral pain is caused by activation of pain receptors resulting from infiltration, compression, extension, or stretching of the thoracic (chest), abdominal, or pelvic viscera. Common causes of visceral pain include pancreatic cancer and metastases in the abdomen. Visceral pain is not well localized and is usually described as pressure-like, deep squeezing.

2.2.3 Neuropathic Pain

Neuropathic pain is caused by injury to the nervous system either as a result of a tumor compressing nerves or the spinal cord, or cancer actually infiltrating the nerves or spinal cord. It also results from chemical damage to the nervous system that may be caused by cancer treatment (chemotherapy, radiation, surgery). This type of pain is severe and usually described as burning or tingling. Tumors that lie close to neural structures are believed to cause the most severe pain that cancer patients feel.

2.2.4 Acute Pain

Acute pain is short lasting and usually manifests in ways that can be easily described and observed. It may, for example, cause sweating or increased heart rate. It can last for several days, increasing in intensity over time (sub acute pain), or it can occur intermittently (episodic or intermittent pain).

2.2.5 Chronic Pain

Chronic pain is defined as pain lasting for more than 3 months. It is much more subjective and not as easily described as acute pain. Effectively treating chronic pain poses a great challenge to physicians. This kind of pain usually affects a person's life in many ways. It can change someone's personality, ability to function and quality of life.

According to the American Cancer Society, chronic cancer pain often involves persistent pain and breakthrough pain. Persistent pain is continuous and may last all day. **Breakthrough pain** is a brief flare-up of severe pain that occurs even while the patient is regularly taking pain medication. It usually comes on quickly and may last from a few minutes to an hour. Many patients experience a number of episodes of breakthrough pain each day.

Breakthrough cancer pain can result from the cancer or cancer treatment, or it may occur during a certain activity (e.g., walking, dressing, coughing). It also can occur unexpectedly, without a preceding incident or clear cause. Breakthrough pain usually is treated with strong, short-acting pain medications that work faster than persistent pain medications.

2.3 ASSESSING AND MANAGING PAIN

Assessment of pain, including a thorough history and comprehensive physical examination, guides indications for diagnostic studies and the development of the pharmacologic and non-pharmacologic treatment plan. The primary source of information should be a patient's self-report. There are many pain rating scales available, ranging from complex multidimensional tools to very simple numeric and picture scales, which can help patients identify pain and then document the efficacy of treatment.

A comprehensive evaluation of pain should include an assessment of the pain intensity, character, frequency, onset, duration and location as well as detailed history of pain, a physical and neurologic examination, a psychosocial assessment, and a diagnostic evaluation that includes tests to determine the cause of pain. It is also important to take into account common co-morbidities, such as sleep disturbances and depression, which can affect pain levels, suffering and, functioning (Chang 2004, Miller et al 2001).

Patients sometimes complain of pain as a way of expressing other forms of suffering, anxiety, or depression (Rabow et al 2003). When this is the case, psychosocial evaluation and intervention will be more effective than analgesics. It is well established that attention and emotion influence pain processing and perception, and conversely, inadequately managed pain can lead to anxiety and depression (Rabow et al 2003, Meuser et al 2001). Therefore, comprehensive assessment is required to determine the optimal plan of care, as specific to pain etiology as possible.

2.4 PREVALENCE OF PAIN IN CHRONIC DISEASES

Assessing pain in patients approaching the end of life requires a multifactorial evaluation. It is important to acknowledge and address the prevalence, high incidence, and serious adverse consequences of pain in end stage conditions that affect patients with advanced medical illness, such as controlled and uncontrolled cancer, heart disease, HIV disease; neurodegenerative diseases; and end-stage renal and respiratory diseases (Doyle et al 2004, Paice 2001). Other pain producing disorders that may require separate treatments may also accompany these conditions.

The prevalence of pain in the terminally ill varies by diagnosis and demographics. Approximately one third of the people who are actively receiving treatment for cancer and two third of those with advanced malignant disease experience pain (Rabow et al 2003, Chang et al 2000). Almost 75% of patients with advanced cancer who are admitted to the hospital report pain upon admission (Brescia et al 1992). In a study of cancer patients who were near the end of life, pain occurred in 54% and 34% at 4weeks and 1 week prior to death, respectively (Coyle et al 1990). In a recent study by Goudas and colleagues (Goudas et al 2005) that compiled the results of 28 epidermiologic surveys, the study authors found that, in one study over 35,000 Japanese cancer patients, 68% to 72% of patients in the terminal stages reported pain. In another study of over 13,000 cancer patients in US nursing homes, an average of 30% of the patients reported daily pain. In those patients, pain varied according to age sex, race, marital status, physical function, depression and cognitive status (Goudas et al 2005).

In other studies of patients admitted to palliative care units, pain often is the dominant symptom, along with fatigue and dyspnoea (Ng and Von Gunten 1998). Until recently, it

was widely believed that patients dying from non-malignant disease did not have high levels of pain. However, it is now known that patients dying from cardiac failure, Chronic Obstructive Pulmonary Disease (COPD), end-stage renal disease, and other end-stage diseases suffer similar levels of pain to those found in-patient with malignant disease (Hall and Skyes 2004, Cohen et al 2000). People at particular risk for under treatment include the elderly, minorities, and women (Cleeland et al 1994, Cleeland et al 1997).

More recently, an attempt has been made to characterize the pain experience of those with HIV disease, a disorder frequently seen in palliative settings. Over 56% of those with HIV disease report pain, with the most common symptoms being headache, abdominal pain, chest pain and neuropathies (Nunmikko and Haanpaa 2005; Doyle et al 2004, Paice and Fine 2001; Larue et al 1994).

2.5 CAUSES OF PAIN IN CANCER PATIENTS

Pain in patients with cancer may be:

- Caused by the cancer itself (this is by far the most common);
- Related to the cancer (e.g. muscle spasm, lymphoedema, constipation, bedsores);
- Related to the anticancer treatment (e.g. chronic post surgical scar pain, chemotherapy-induced mucositis);
- Caused by a concurrent disorder (e.g. spondylosis, osteoarthriris).

According to World Health Organization (1996), The cancer itself causes pain through:

- Extension into soft tissue;

- Visceral involvement;
- Bone involvement;
- Nerve injury;
- Raising intracranial pressure

2.6 TREATMENT OF PAIN

There are many ways to relieve pain, from drugs to surgery to acupuncture. Treatments vary from individual to individual, depending on the type and severity of pain, risk factors involved with using a particular treatment, and personal preference. Some of the most common treatments are:

2.6.1 Non-pharmacologic Management of Pain

An important aspect of any management strategy is the use of non-pharmacologic treatments (Fine 2004, AGS 2000). There are a variety of non-pharmacologic approaches to pain that have been shown to be effective in alleviating pain for patients with advanced illness. These include physical interventions, such as positioning and active or passive mobilization (therapeutic exercise); techniques, such as Transcutaneous Electrical Nerve Stimulation (TENS), massage, and heat/cold; and complementary and alternative medicine techniques, music, and relaxation/imagery exercises.

2.6.2 Pharmacotherapy

There are several, possible methods of approaching pharmacologic pain management for patients with advanced diseases. Patients may require several different medications to deal with a variety of pain syndromes and disease- or treatment-related discomfort. For expedient and thorough treatment, it is often wise to adopt a stepwise approach to the use of pain medications. The World Health Organization (WHO) has developed a simple, 3-step model for managing cancer pain that can be applied to many different situations. It has been modified over time to adapt to the evolving fields of pain and palliative medicine. This revised approach recommends that mild pain (1-3 on a numerical analogue scale) should be treated with nonopioid pain relievers, such as aspirin, acetaminophen, and nonsteroidal anti-inflammatory drugs (NSAIDs), with or without adjuvant therapy. Higher pain intensities indicate the use of nonopioid analgesics along with opiate derivatives, such as codeine, hydrocodone, or tramadol (Miaskowski, et al 2005). If pain is not relieved, then titration of opioids, such as morphine, hydromorphone, and fentanyl, in combination with nonopioid analgesics and adjuvants is indicated. Refractory pain syndromes will often require more invasive techniques, such as spinal opioids, nerve block, or neurostimulation (Fine, 2005).

2.6.2.1 Nonopioid Analgesics

Acetaminophen (Panadol®, Tylenol ®). Acetaminophen has been determined to be one of the safest analgesics for long-term use in the management of mild pain or as a supplement in the management of more intense pain syndromes. It is especially useful in the management of nonspecific musculoskeletal pain or pain associated with osteoarthritis, but should be considered an adjunct to any chronic pain regimen.

NSAIDs. NSAIDs reduce the biosynthesis of prostaglandins by inhibiting cyclooxygenases I & II (COX I & II) and the cascade of inflammatory events that cause, amplify, or maintain nociception. NSAIDs also appear to directly affect the peripheral and central nervous systems. COX has been identified in spinal cord neurons, and may play a role in the development of neuropathic pain, but these agents do not appear to be useful in the treatment of neuropathic pain (Miakowski et al 2005).

NSAIDs are useful in treating many painful conditions mediated by inflammation, including those caused by cancer (Hoppmann et al 1991, Mercadante et al 2002). These agents cause minimal nausea, constipation, sedation, or effects on mental function, although there is evidence that their use can impair short-term memory in older patients (Mercadante et al 2002). The gastro intestinal effect of the NSAIDs include G. I. T. upset, irritation and bleeding, these often limit their use.

2.6.2.2 Opioid Analgesics

Opioid analgesics are the most useful agents for the treatment of pain associated with advanced disease. They reduce pain-producing signals and perception throughout the nervous system, regardless of the pathophysiology of the pain (Inturrisi, 2003). Opioids exist in 3 classes -- pure agonists, mixed agonist-antagonist, and pure antagonists (Fine and Portenoy, 2004). They are classified according to their interaction with the 3 major opioid receptor types. Pure agonists, which interact with μ (mu) receptors in the brain and spinal cord, are generally preferred for managing moderate-to-severe pain, and have been shown to reduce pain in a number of neuropathic pain syndromes, contrary to previous thinking (Rowbotham et al 2003). Opioids can also be used to treat dyspnea and as an anesthetic

adjunct. There are few, if any, indications for the mixed agonist-antagonist agents. The pure antagonists are used to treat acute overdose and, in selected cases, as a means of treating or preventing opioid-induced bowel dysfunction. The opioids used most commonly in palliative care are morphine, hydromorphone, fentanyl, oxycodone, and methadone. Other opioid receptors are Δ-receptor for analgesia and κ-receptor for spinal analgesia, sedation, meiosis.

Morphine. Morphine, the prototype agonist, is considered the "gold standard" of opioid analgesics and is used as a measure for dose equivalence (Fine and Portenoy 2004, American Pain Society, 2003). Although some patients cannot tolerate morphine due to pruritus, headache, dysphoria, or other adverse effects, common initial dosing effects, such as sedation and nausea, often resolve within a few days (Paice and Fine, 2001). It is best to anticipate these adverse effects, especially constipation, nausea, and sedation, and prevent or treat appropriately.

Fentanyl. Fentanyl is a lipophilic opioid that can be administered parenterally, spinally, transdermally, transmucosally, and nebulized for the management of dyspnea (Paice and Fine, 2001). Because of its potency, dosing is usually conducted in micrograms. Careful fentanyl dosing is particularly important in older patients. A recent study of transdermal fentanyl in postoperative patients found that absorption was significantly delayed in men 64-82 years of age compared with men 25-38 years of age (Fine, 2001).

Oxycodone. Oxycodone is a synthetic opioid available in a long-acting formulation (*OxyContin*), as well as immediate-release tablets (alone or with acetaminophen) and liquid. It is approximately as lipid-soluble as morphine, but has better oral absorption

(Davis et al 2003). Side effects appear to be similar to those experienced with morphine, but one study comparing the 2 formulations in patients with advanced cancer found that oxycodone was less likely to cause nausea and vomiting (Lauretti et al 2003).

Methadone. Methadone has several characteristics that make it useful in the management of severe, chronic pain (Shaiova et al 2002, Fine and Portenoy 2004, Bruera et al 2004). Methadone has a half-life of 24-36 hours with a much longer terminal half-life, allowing for prolonged dosing intervals. Methadone is an *N*-methyl-D-aspartate (NMDA) receptor antagonist, which may be of particular benefit in neuropathic pain (Davis et al 2001, Morley et al 2003).

Hydromorphone. Hydromorphone (*Dilaudid*) is a synthetic opioid that can be a useful alternative to morphine. It is available in oral tablets, liquids, suppositories, and parenteral formulations, but the only long-acting formulation was recently recalled by the FDA due to interactions with alcohol that could lead to excessively rapid drug release (Fine and Portenoy 2004, Otis and Fudin 2005). As a synthetic opioid, hydromorphone can be useful if there is inadequate pain control or when patients experience true allergic responses to morphine or intolerable side effects occur.

2.6.2.3 Adjuvant Drugs

The term "adjuvant analgesics" is often used synonymously with "coanalgesics," "pain-modifying drugs," and similar descriptives. A wide variety of nonopioid medications from several pharmacologic classes have been demonstrated to reduce pain caused by various pathologic conditions (e.g., tricyclic antidepressants) or to modify the ongoing disease

process in a way that specifically reduces pain (e.g., bisphosphonates). Under most circumstances, these drugs are indicated for the treatment of severe neuropathic pain or bone pain, and opioid analgesics are used concurrently to provide adequate pain relief. Typical adjuvants include tricyclic antidepressants, serotonin-norepinephrine reuptake inhibitor (SNRI) antidepressants, anticonvulsants, corticosteroids, and other disease-modifying drugs, such as bisphosphonates for metastatic bone pain.

Antidepressants. The analgesic effect of tricyclic antidepressants appears to be related to inhibition of norepinephrine and serotonin reuptake, making these neurotransmitters more available within central nervous system pain inhibitory pathways. There are many significant, controlled clinical trials for several pain conditions, and a recent consensus panel listed tricyclic antidepressants as 1 of 5 first-line therapies for neuropathic pain (Hammack et al 2002, Dworkin et al 2003).

Anticonvulsants. The older anticonvulsants, such as carbamazepine and clonazepam, relieve pain by blocking sodium channels (Farrar, 2001). These compounds are very useful in the treatment of neuropathic pain, especially pain with episodic, lancinating qualities.

Corticosteroids. Corticosteroids are particularly useful for neuropathic, visceral, and bone pain syndromes, including plexopathies and pain associated with stretching of the liver capsule due to metastases (Mercadante et al 2001, Wooldridge et al 2001). Dexamethasone produces the least amount of mineralocorticoid effect, making it the least toxic choice. Dexamethasone is available in oral, intravenous, subcutaneous, and epidural formulations. The standard dose is 16-24 mg/day and can be administered once daily due to the long half-

life of this drug, but divided doses are usually used to mitigate high-dose toxic effects, such as psychosis and severe blood sugar abnormalities in diabetic patients.

Adjuvant drugs are used to enhance opioid analgesics and to provide pain relief for certain types of pain such as neuropathic pain and bone pain. Neuropathic pain is less responsive than other types of pain to both nonopioid and opioid analgesics. Adjuvant drugs are also used to relieve side effects of other pain relievers.

For neuropathic pain, analgesics are always the first course of action, but generally neuropathic pain does not respond well to analgesic drug therapy. Adjuvant drugs used to relieve neuropathic pain include antidepressants, anticonvulsants, oral local anesthetics, cutaneous local anesthetics, corticosteroids, and various others. Antidepressants should be the first course of adjuvant drug therapy. The doses used are far less than what are required to produce a mood-altering effect.

2.6.3 Psychotherapy

A complex array of psychological and emotional variables plays a role in the suffering that a patient with cancer pain experiences. The level of emotional distress that a cancer pain patient feels varies individually, depending on many factors such as personality and family support. It is estimated that 25% of all cancer patients show signs of clinical depression, with the percentage increasing to greater than 70% for patients with advanced stages of the disease. Untreated pain leads to many cancer suicides. Psychotherapy is an important part of cancer pain management. The goals of psychotherapy are to provide emotional support and stability, and to help patients adapt to their crisis situation.

2.7 PALLIATIVE CARE

Palliative care is defined as the active total care of patients whose disease is not responsive to curative treatment; its goal is to ensure that the patient and family achieve the best possible quality of life (World Health Organization 1990).

Palliative medicine can be defined as the study and management of patients with active, progressive, far-advanced disease, for whom the prognosis is limited and the focus of care, is the quality of life (Doyle, 2004).

Cytotoxic drugs used in palliative chemotherapy attack cells during cell division; agents are phase specific and cycle specific. Phase-specific drugs terminate cells only if given during a certain phase of the cells' cycle. Cycle-specific drugs target cells during any phase of division; thus, higher doses kill more cells than lower doses (Kim et al 2005). Cytotoxic drugs can also be classified according to their specific cellular mode of action. **Antimetabolites** (5- fluorouracil, fludarabine phosphate, methotrexate, gemcitabine) interfere with the incorporation of nucleic acid bases into DNA; their activity peaks during the S phase of the cell cycle. **Alkylating drugs** (cyclophosphamide, ifosfamide, chlorambucil, melphalan, cisplatin, carboplatin) form linkages between the strands of DNA that prevent this biogenic substance from separating during the M phase of the cell cycle (Kim et al 2005). **Antitumor antibiotics** (bleomycin, doxorubicin hydrochloride, epirubicin hydrochloride) typically interfere with binding of base-pair molecules and prevent separation of DNA strands during the M phase of the cell cycle (Kim et al 2005). **Plant alkaloids** act as either mitotic spindle inhibitors (vincristine, vinblastine, paclitaxel)

or topoisomerase inhibitors (topotecan hydrochloride, irinotecan,and etoposide) (Mclllmurray, 2004). Given the potential toxicities of chemotherapeutic agents, it is critical to educate patients about their illness and to discuss their expectations of treatment. Many agents are available for palliation, and it is important to be aware of their potential adverse effects. Ideal candidates for palliative treatment are patients with excellent performance status and a tumor sensitive to chemotherapy. Performance status is a measure of a patient's functional capacity. A patient with significant co-morbidities and poor functional status will have difficulty tolerating treatment and may become more disabled. The more challenging issue for both patient and physician is balancing symptom relief against treatment toxicity. When adverse effects of palliative chemotherapy begin to cause a decline in performance status, physicians must reconsider treatment and patient goals. Working together as a team, the patient, family, and physician can make the best decision (Kim et al 2005).

Opioid analgesics, a class of naturally derived and synthetic drugs, represent the mainstay of cancer pain therapy, and may be classified according to their receptor profile: as agonist, partial agonist, or agonist–antagonist. The latter, such as pentazocine, has no role in the modern management of cancer pain, given the high rate and the severity of associated adverse effects (above all, cognitive failure and hallucination). On the basis of pain intensity (moderate or severe), and according to World Health Organization (WHO) analgesic scale (World Health Organization 1986). Opioids can be distinguished as weak and strong (Inturissi, 2002). Their functional effects are derived from their complex and individually variable and agent-specific interactions with opioid receptors, which have

been found in the peripheral nerves, at pre-synaptic and postsynaptic sites in dorsal horn of the spinal cord, in the thalamus, in the cortex (ascending pain transmission system), as well as in structures of the descending inhibitory system (Kalyuzhny, 2003). So, the specific functional activities and therapeutic properties of each opioid depend on the difference in receptor profile effects and on pharmacological characteristics.

2.8 MEASURING PAIN INTENSITY

Pain intensity can be assessed using any of several available tools, such as the visual analogue scale, the verbal scale and the numerical rating scales (NRS) (Pasquale et al 2005), based on patient self-reporting. In the NRS, mild pain ranges from 1 to 4, moderate pain from 5 to 6 and severe pain from 7 to 10. A NRS score rated as 4 or more is an indicator of poor pain control; in these cases, the dose of analgesic should be increased or another drug added. Pain rated as 5 or above is considered substantial and interfering with the quality of life (Caraceni, 2002). The WHO has devised an analgesic scale for cancer pain, in which each drug is selected in a step-wise fashion based on the overall severity of the pain (World Health Organization 1986). This methodology has been shown to provide analgesia to 90% of cancer patients (Twycross, 1996). When opioids are used, the initial treatment with these agents should include immediate release (IR) preparations, given by using frequent dosing as needed to relieve pain and to determine the opioid requirement, which may largely range in different individuals. The dose should be upward as rapidly as possible to achieve a stable analgesia, and a slow release (SR) opioid formulation can be given, according to the reached opioid requirement, continuing to provide additional doses

as needed. It has to be noted that SR opioids are much more expensive and do not result in better analgesia or decreased side effects, compared to IR opioids; so the reasons for changing from IR to SR opioids are: the patient's comfort and the number of doses to be administered. If pain is not adequately controlled after a careful dose escalation, it may be helpful to switch to a different opioid. The rationale of opioid substitution is that there is an incomplete cross-tolerance among different opioids acting at different opioid receptors.

However, given that no opioid has clear advantage over morphine, it remains the recommended benchmark of choice as initial therapy for cancer pain, because of clinical experience, manageability, versatility and its being administrable by several routes (Davis 2005, Hanks 2001).

2.9 PREVALENCE OF CANCER IN AFRICA

In 1985, there were an estimated 7.62 million new cancer cases, with 3.66 million (48 percent) in the developed countries and 3.96 million (52 percent) in the developing countries (Parkin et al, 1993). The figure rose to 8.1million new cases in 1990, an increase of 6.3 percent (Parkin et al,1991).

Prostate, lung, colon and rectum are the top three cancer sites in African American men while liver, prostate and oesophageal cancers top the list in most registries in sub-Saharan Africa (Ogunbiyi, et al 1997, Osegbe,1997). Four decades ago (1960-1969), the top five cancers in men were liver, non- Hodgkin's lymphoma, Burkitt's lymphoma, connective tissue and stomach cancer. But within the next two decades, prostate cancer moved up to

the second position and in the last decade, it became the most common cancer in Nigerian men (Ogunbiyi, et al 1997, Osegbe,1997).

Reports from the Ibadan cancer registry indicate that carcinoma of the prostate has emerged as the most common cancer in Nigerian men. Available records suggest that the disease is increasing in prevalence in sub- Saharan Africa. Known risk factors for prostate cancer include age, race, positive family history, and dietary fat intake. Prostate cancer increased with age faster than any other malignancy and is poised to become a major public health problem in sub-Saharan Africa as life expectancy continues to increase. The mean age of patients is 71.4 years with over 77% of cases over the age of 60 years (Ogunbiyi, et al 1997). A recent report from Lagos, another major city in Southern Nigeria revealed a mean age of 68.3+/- 9.4 years for prostate cancer (Osegbe,1997). Nkposong and Lawani reported a mean age of 60 years about three decades age. This age distribution is similar to that found in other African countries (Mali, Uganda, Zimbabwe), with the majority of cases occurring in men between the ages of 60 and 80 years (Ogunbiyi, et al 1997). Liver cancer is the second most common cancer in Nigerian men while it still remains the most common cancer in men in some series from various parts of sub-Saharan Africa (Koulibaly et al 1997).

The distribution of cancers in women in sub-Saharan Africa has also shown some changes in the past few decades as seen in the men. Available data indicate that from the 1960s, carcinoma of the cervix has been the most common cancer in Nigerian women. This pattern is also reflected in the series of various pathological laboratories in the country.

However, recent reports from the Ibadan cancer registry indicate that carcinoma of the breast has overtaken carcinoma of the cervix (Adebamowo and Adekunle 1999). Data from the Ibadan cancer registry indicates a mean age of 48 years with peak age incidence ranging from 36 to 45 years among women with breast cancer. Twelve percent of the patients are below the age of 30 years in contrast to 0.5% of Caucasian patients in this age range. Also postmenopausal patients account for only 20% of breast cancer patients in sub-Saharan Africa compared with over two-third of patients reported among Caucasians (Ihekwaba, 1992).

Cervical cancer is the second most common cancer in women in the Ibadan cancer registry (Adebamowo and Adekunle 1999) although data from some African countries report cervical cancer as the most common malignant disease in females. Data from most series indicate that maximum incidence occurs around age 50 years (Koulibaly et al 1997). The high incidence of this disease has been reported from various centers in sub-Saharan Africa. Presumably, this relates to the high prevalence of infection with oncogenic subtypes of human papilloma virus (HPV), now accepted as the major causative agent for cervical cancer (International Agency for Research on Cancer, 1995). In Nigeria, there is very little information about the prevalence of HPV in the general population without cytological abnormalities. However, published studies do not; in general suggest that infection rates are higher than in various European countries. Prevalence of all HPV subtypes in Kenya range from 3.7% to 19.5% (Engels et al 1992).

CHAPTER THREE

3.0 MATERIALS AND METHOD

The study was a prospective and retrospective one, which involved interviewing patients and issuing questionnaires to Health Care Personnel (Pharmacists, Doctors and Nurses). The study was conducted at the Radiotherapy and Oncology Center of Excellence, Ahmadu Bello University Teaching Hospital, permanent site Shika-Zaria

Patient selection: for patients to be included in the study they must be

1.Diagnosed histologically with cancer

2.Above the age of 18

3.An old patient (i.e. an old cancer patient in the Oncology Clinic)

The study was conducted in two stages, first the patients were interviewed and their folder numbers taken. The interview was conducted at the Oncology clinic on clinic days, the

radiotherapy room every weekday and also at the chemotherapy ward. Interview was done after the initiation of therapy. For patients on chemotherapy they must have taken at least one course of their therapy. And patients on radiotherapy must have taken at least five fractions of radiation. The interview was conducted by the researcher throughout the study. The second part involved getting the patient medication profiles from the folders. The data obtained included antineoplastic agents and analgesics prescribed, radiotherapy records and other pharmacological agents prescribed for the patients.

The questionnaire for the Health Care Personnel was distributed to them by the researcher and collected after a period of one week. The Health Professionals at the Oncology clinic were used, ten questionnaires were given to the Nurses and seven responded. While the consultants at the clinic (five) were given the questionnaire and all of them responded. The Pharmacists at the pharmacy department were given questionnaires (ten) and they all responded and returned their questionnaires.

The total number of patients visiting the clinic for a period of one year was 730 comprising of 460 (63%) female and 270 (37%) male. And from the sample size calculation (Appendix C), the sample was found to be 256. A total of 260 patients were interviewed. Involving 164 female and 96 male patients, thus representing the ratio of the patients attending the clinic by proportion.

Therefore the first 164 female and 96 male patients were used in the study.

In an attempt to assess the knowledge of the Health Care Professionals on prescription pain medications, scores were awarded each of the statements as follows;. **S1** strongly agree 5 points, agree 4 points; **S2** strongly disagree 5 points, disagree 4 points; **S3** strongly disagree 4 points, disagree 5 points; **S4** strongly disagree 5 points, disagree 4 points; **S5** strongly agree 5 points, agree 4 points; **S6** strongly agree 4 points, agree 5 points; **S7** strongly agree 4 points, agree 5 points; **S8** strongly agree 5 points, agree 4 points; **S9** strongly agree 5

points, agree 4 points; **S10** strongly agree 5 points, agree 4 points. And the total aggregate for each profession was calculated.

3.1 DATA HANDLING

The data was collected and analyzed using the Statistical Package for Social Sciences (SPSS). And the results are presented in graphs, tables and percentages.

3.2 DATA SOURCE

The data used in this study were collected from two sources: Primary and Secondary. The primary data are the first hand information obtained directly from the respondents designed to give information in response to specific questions. The secondary data were not obtained directly from the respondents, this involves information obtained from their folders.

CHAPTER FOUR

4.0 RESULTS

The table below shows the age and sex distribution of the patients, majority of the patients are between the ages of 46 and 55 years. One hundred and thirty (50%) of the patients were 46 years and above. Majority of the patients 80 (30.7%) were aged between 46years and 55years.

TABLE 4.1 AGE AND SEX DISTRIBUTION OF CANCER PATIENTS AT ABUTH

Age	Female	Male	Total	Percentage
16 – 25	8	16	24	9.2
26 – 35	35	14	49	18.8
36 – 45	41	16	57	21.9
46 – 55	51	29	80	30.8
56 – 65	25	10	35	13.5
66 – 75	4	10	14	5.4

> 75	-	1	1	0.4
	164	96	260	100

The mean age of the patients was 45 years

The mean age of the female patients was 44.9 ± 1.35 years

The mean age of the male patients was 44.6 ± 2.85 years

The age range was between 18years and 75years

The following figures show the demographic data of the patients diagnosed with cancer seen at the Oncology clinic.

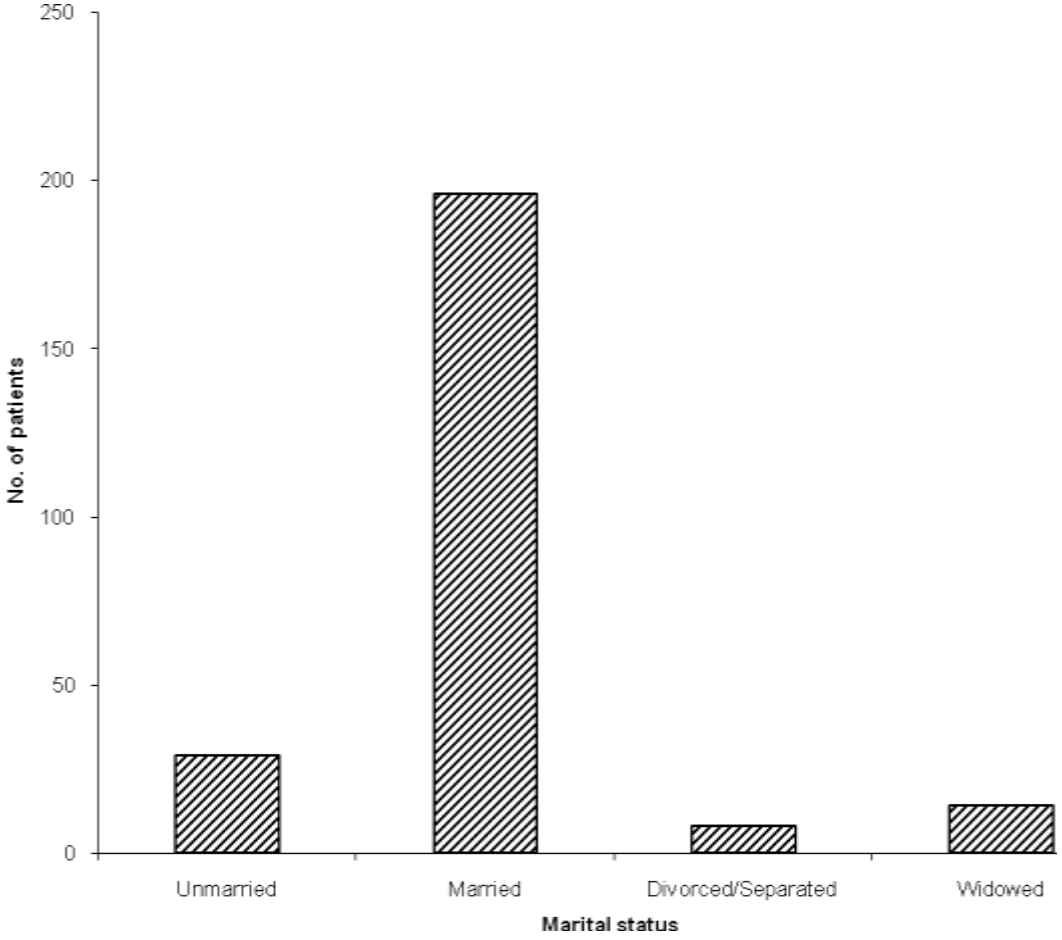


Fig. 4.1 Marital Status of Patients diagnosed with Cancer at ABUTH

Figure 4.2 shows that 196 of the patients are married, and 29 of the patients are unmarried (i.e. have never been married). The rest of the patients (22) are either divorced, separated or widowed.

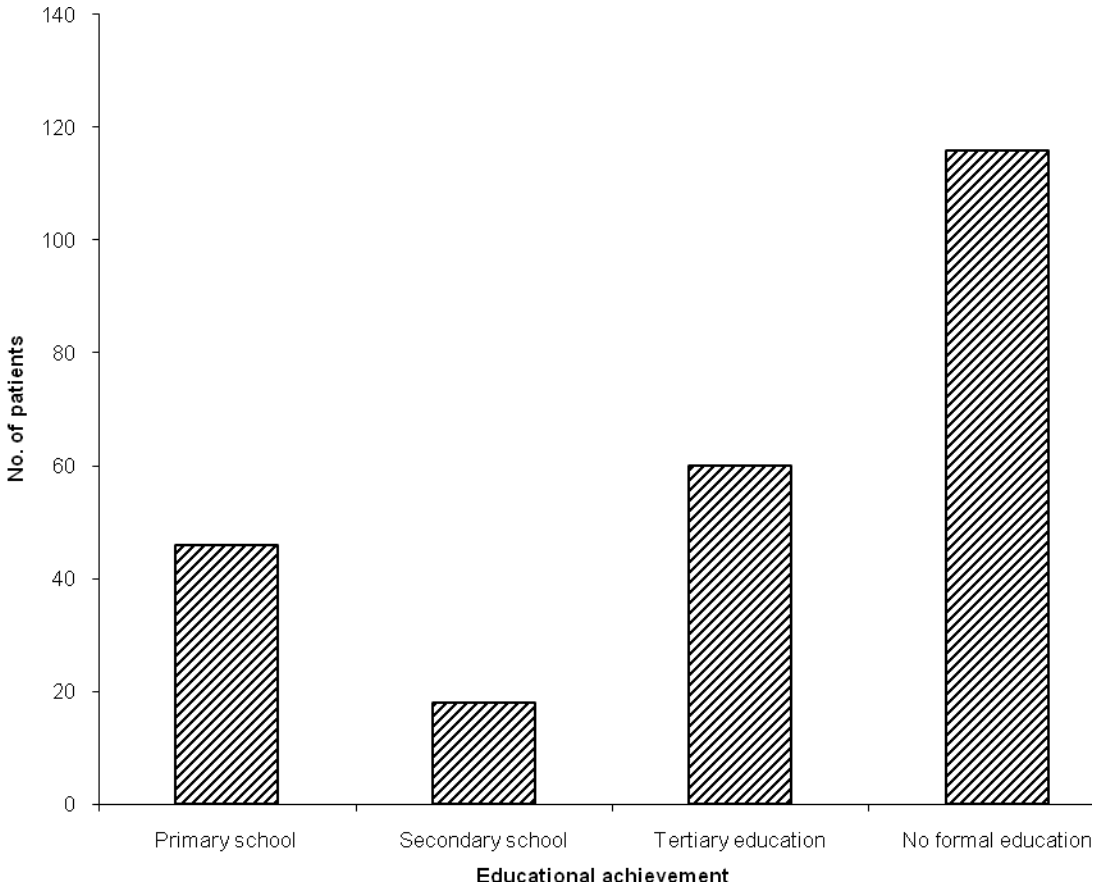


Fig. 4.2 Educational achievements of cancer patients seen at ABUTH

This figure shows that 116 (48%) of the patients have no formal education. 46 of the patients have only primary school education. 18 secondary and 62 tertiary education.



Fig. 4.3 Occupation of Cancer Patients at ABUTH

135 of the patients were housewives, and only 32 of the patients are civil servants. The business persons are only 44, while 22 of the patients are students.

The patient's description of pain, its quality and its distribution may indicate its pathophysiology. Hence a good patient assessment is imperative (Cherny and Foley1994). The figures below shows pain description, pattern, rating and the effect of pain on sleep.

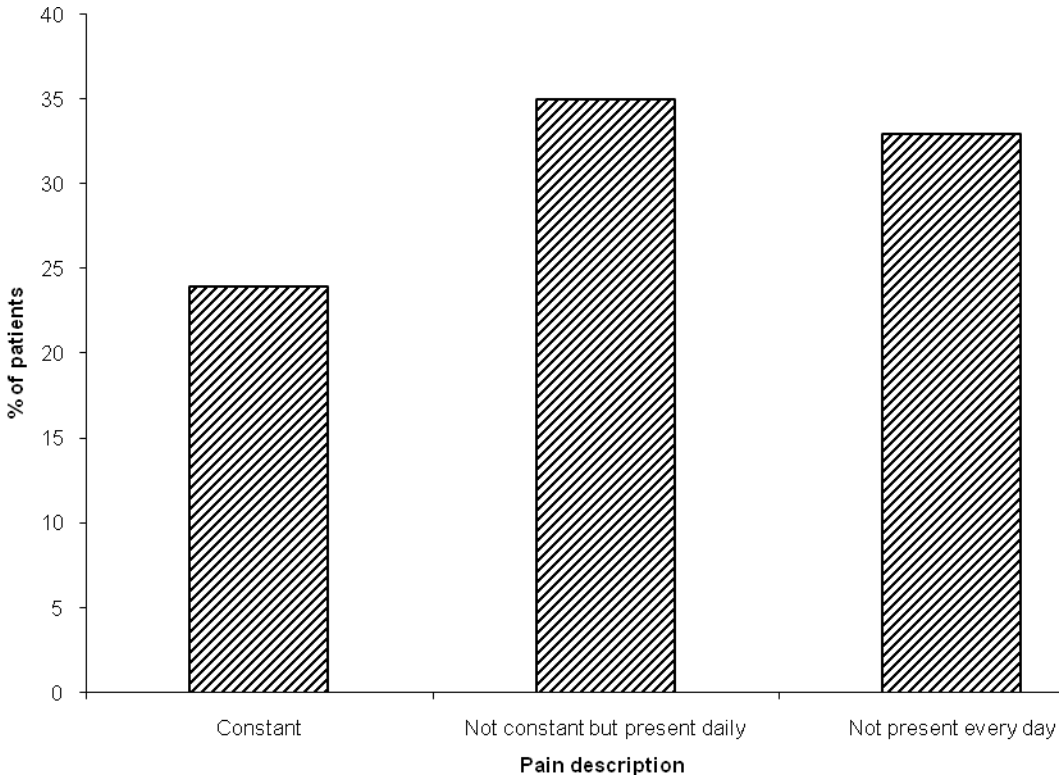


Fig. 4.4 Pain description of Patients Diagnosed with Cancer at ABUTH

63 of the patients reported constant pain, 91 of them said their pain was not constant but was present everyday. The rest of the patients (86) said their pain was not present everyday.

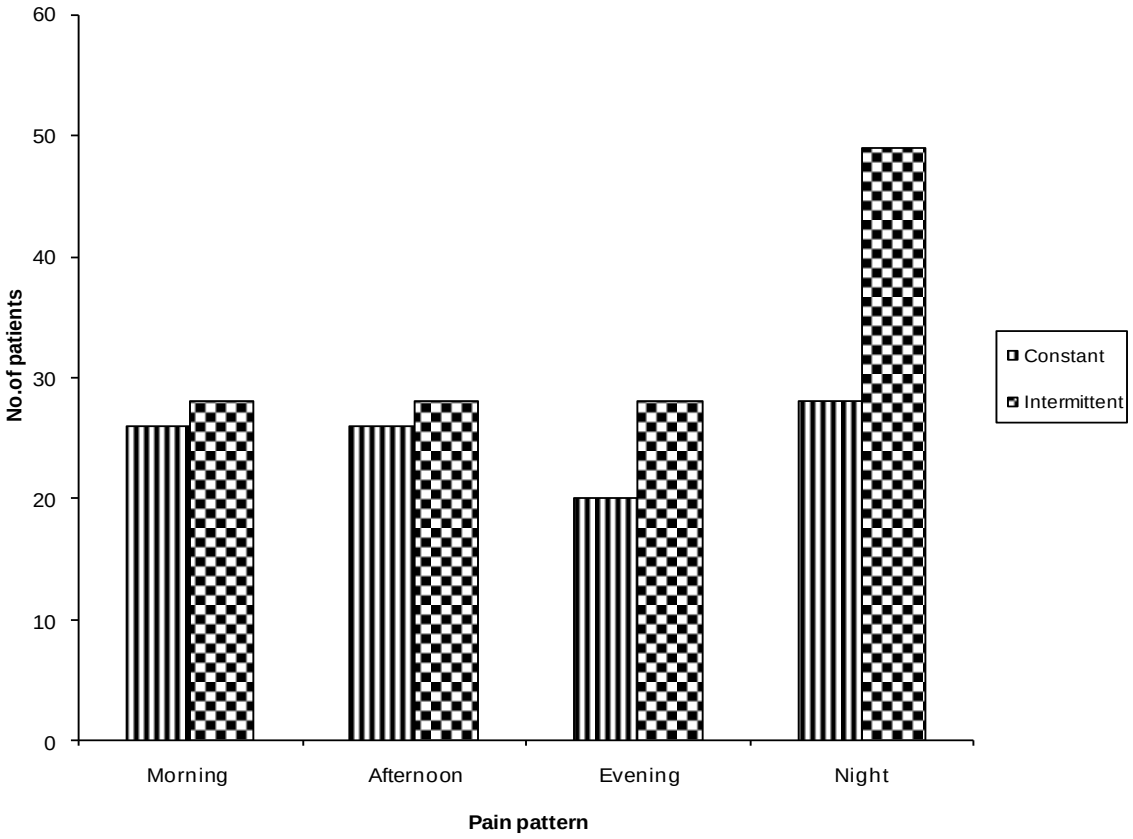


Fig. 4.5 Pain pattern in patients diagnosed with cancer at ABUTH

77 of the patients experience pain mostly at night, and 49 of the patients managed said the pain was intermittent.

TABLE 4.2 EFFECT OF PAIN ON THE SLEEP PATTERN OF CANCER PATIENTS AT ABUTH 2005

	Always	Sometimes	Never
Trouble falling asleep	Nil	26	17
Medication needed to Fall asleep	Nil	22	21
Awaken by pain	Nil	12	31
		60	69

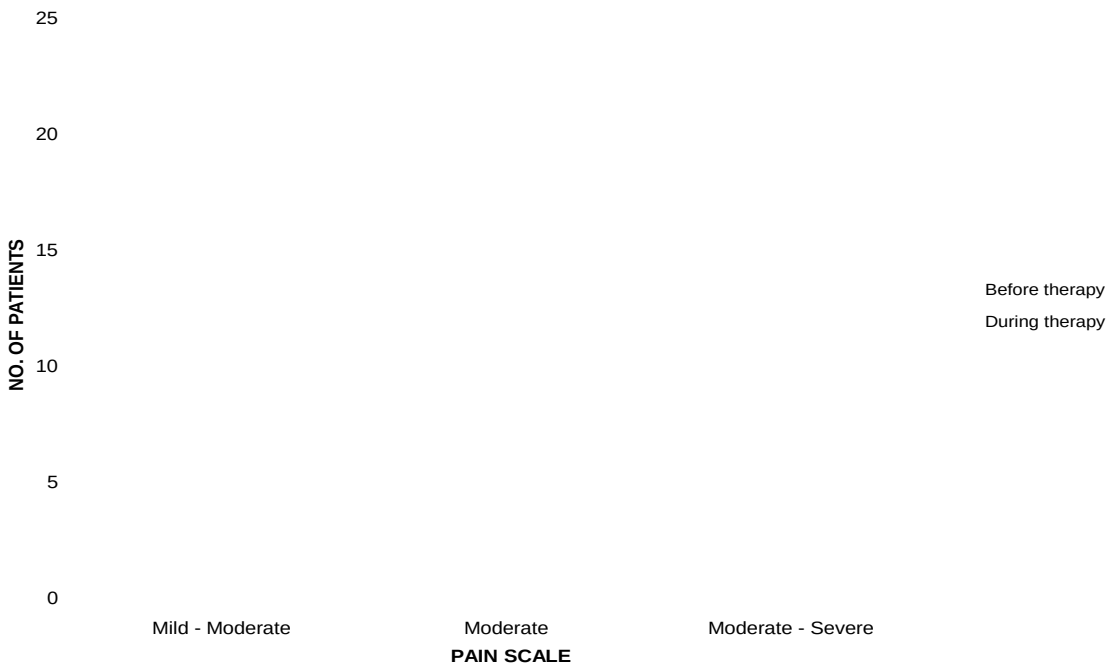


Fig. 4.6 Pain rating in cancer patients ABUTH before and during therapy.

70 of the patients had mild-moderate pain. 73 moderate and 29-severe pain.

In the figures that follow (Fig.4.8 - 4.12), the commonly prescribed drugs are shown.

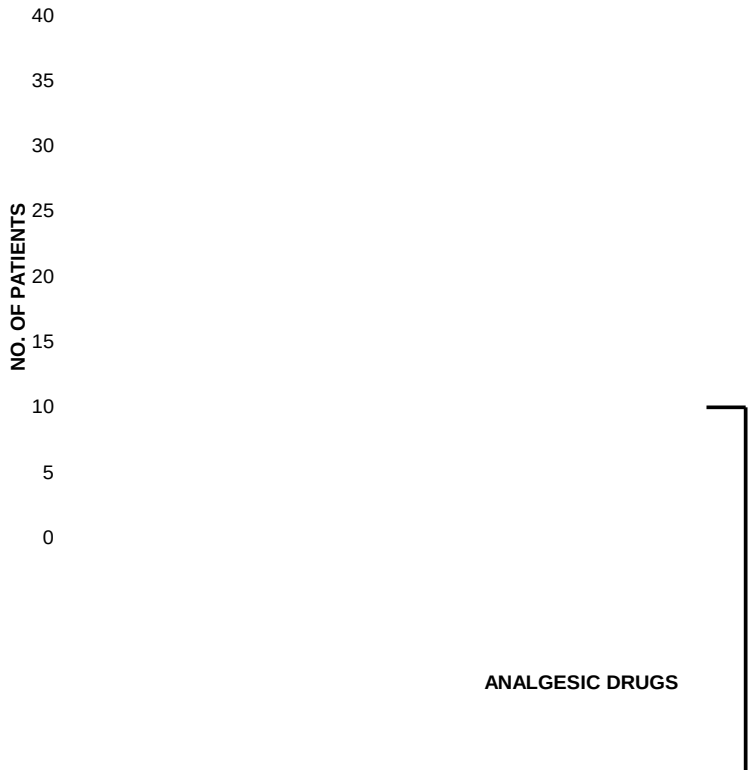


Fig. 4.7 Pattern of Prescription for Analgesics for cancer at ABUTH

The above figure shows the analgesics prescribed for the patients, 35 of the patients were prescribed diclofenac (NSAID), 31 of the patients were prescribed dihydrocodeine (Opioid analgesic) and only 21 of the patients were prescribed morphine (the "gold standard opioid). Non availability, inaccessibility of the opioids accounted for the use of more NSAIDs.

On this table the different types of cancer seen among male and female patients is shown.

TABLE 4.3 OCCURRENCE OF CANCERS AT ABUTH

Cancer type	female	male	Total

Cervix	69	None	69
Breast	60	2	62
Genitourinary system	8	8	16
Head and neck	1	36	37
Sarcomas	4	18	22
Skin	5	9	13
Lymphatic system	4	4	8
Gastrointestinal system	4	3	7
Aggressive fibro cystosis	None	7	7
Metastatic	2	4	6
Astrocytoma	2	None	2
Dermacystic Carcinoma	1	None	1
			250

Sixty-nine (27.6%) of the patients were diagnosed with cancer of the cervix, 62 (24.8%) of the patients (two men) were diagnosed with breast cancer. Genitourinary cancers include prostate (4), ovarian (3), endometrial (2), scrotal (3), bladder (2) and cancer of the vulva (2). The sarcomas includes Kaposi's sarcoma (2), malignant fibrous histocytoma (4), osteosarcoma (4), soft tissue sarcoma (7), dermatoid fibroma (1), and neurofibroma (4). Cancers of the gastrointestinal tract includes anorectal (5), liver (1), and colorectal (1).

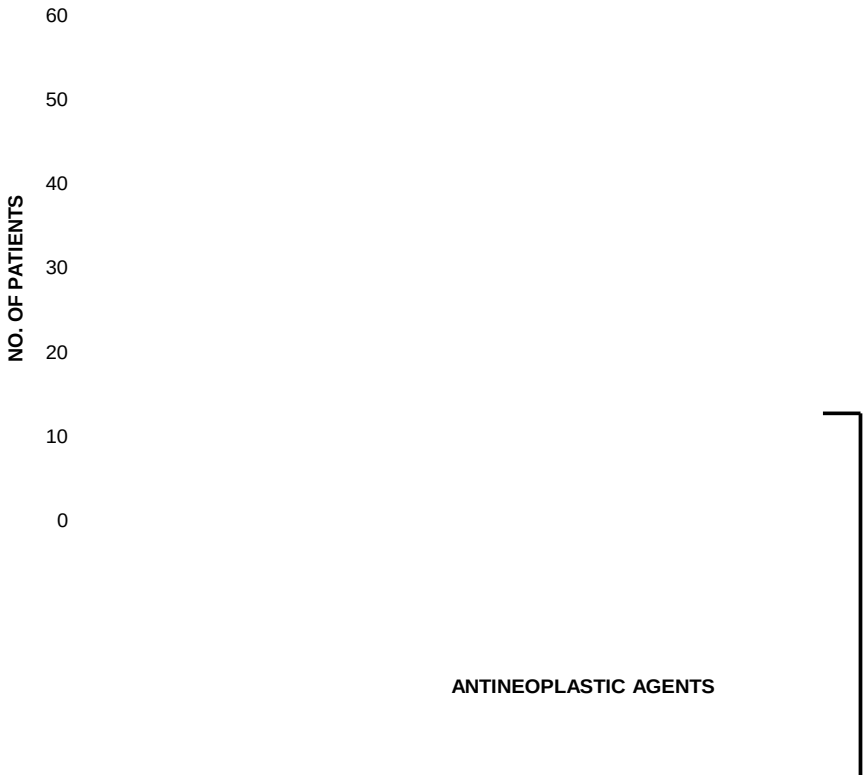


Fig. 4.8 Pattern of Antineoplastic Drugs Prescription for Cancer Patients at ABUTH

51 of the patients were prescribed 5-florouracil, 39 patients were prescribed cyclophosphamide, 38 doxorubucin, 24 cisplatin and 13 patients were prescribed tamoxifen.

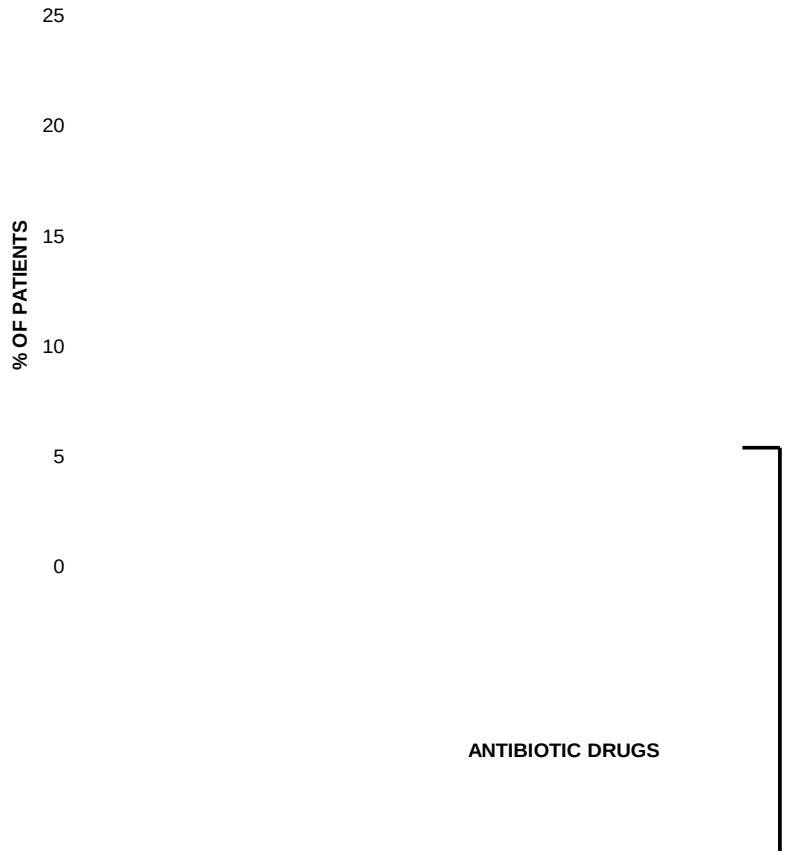


Fig. 4.9 Pattern of Antibiotic Drugs Prescription for Cancer Patients at ABUTH

55 of the patients were prescribed metronidazole, 42 ampicillin+ cloxacillin combination, 23 Ciprofloxacin and 13 were prescribed augmentin.

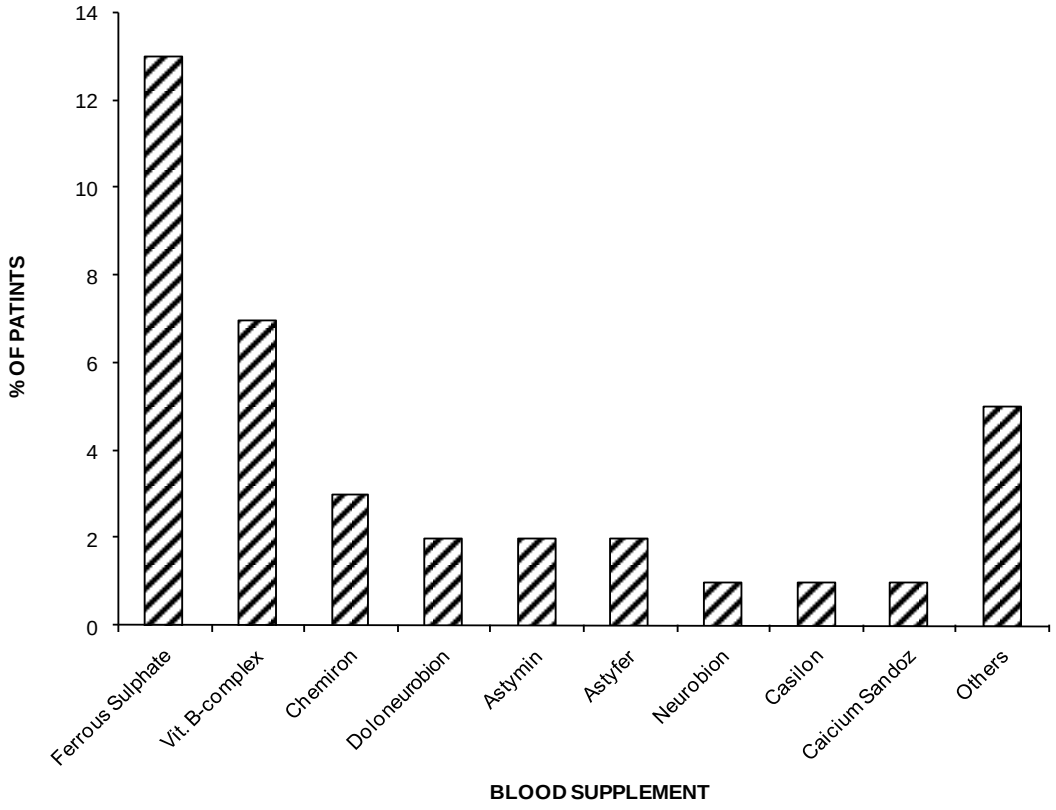


Fig. 4.10 Pattern of Blood Supplements Prescription for Cancer Patients at ABUTH

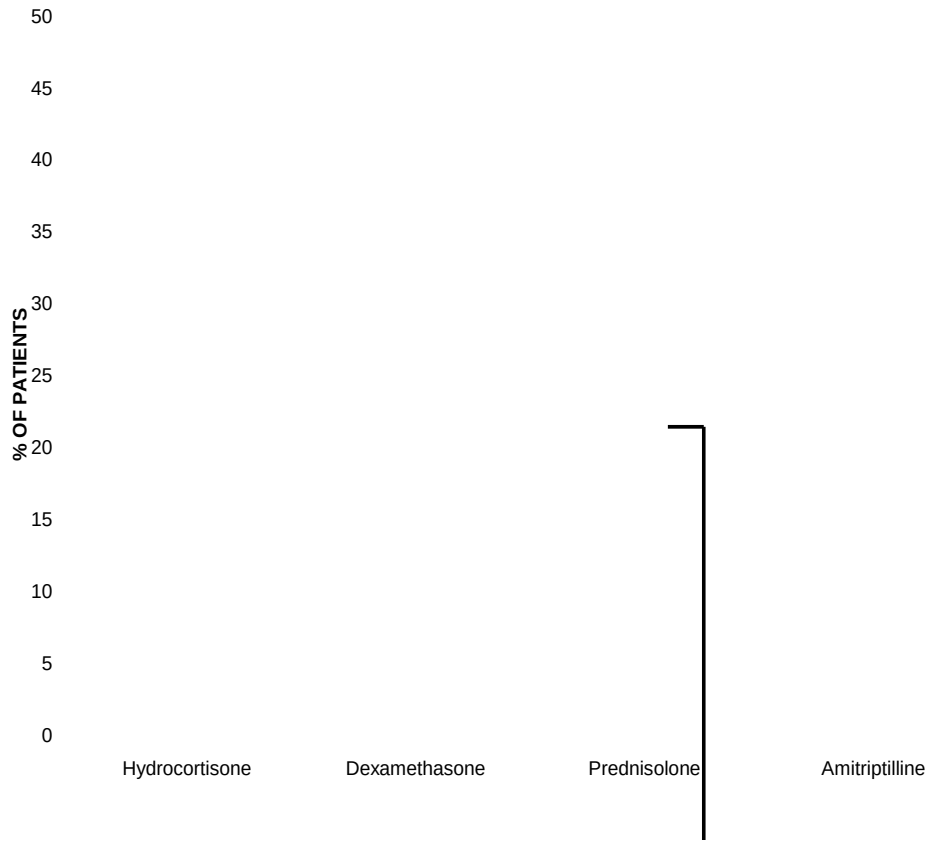


Fig. 4.11 Pattern of Adjuvant Drug Prescription for Cancer Patients at ABUTH

72 of the patients on chemotherapy were prescribed Dexamethasone, 46 hydrocortiosne, 5 prednisolone and 2 of the patients were prescribed anitriptyline.

TABLE 4.5 COST IMPLICATION OF MANAGING PAIN IN PATIENTS DIAGNOSED WITH CANCER AT ABUTH DURING THE STUDY PERIOD

Procedure		No. of patients	Total (₦)
(a)	Cost of Radiotherapy	124 (47.7%)	**2,498,600:00**
(b)	Cost of laboratory Investigations	260(100%)	**1,326,000:00**
•	Chemical pathology 5,100 per patient		
•	Heamatology		**204,350:00**
(c)	Chemotherapy		**5,413,980:00**
•	Antineoplastic agents		
•	Consumables		**701,000:00**
(d)	Average cost of analgesics	215 (82.7)	**290,160:00**
(e)	Surgery 31,255:00 per patient		**1,781,535:00**
•	Drugs and gases in anaesthesia		**655,500:00**
•	Admission charges		**342,000:00**
(f)	Specialized investigations		
•	Abdominal CT for patients with cervical, prostate, ovarian, anorectal, endometrial, bladder, and colorectal cancers.	86(33.1%)	**3,010,000:00**
•	Mammography	62(23.8%)	**124,000:00**
			16,347,125:00

CHAPTER FIVE

5.0 DISCUSSION

5.1 Age distribution of cancer patients

In Nigeria, patients tend to present at a younger age than in developed countries. Although this is often discussed in the clinical literature, it is almost certainly a "birth cohort effect," reflecting the age distribution of the population and other factors, including access to health care (Adebamowo, 2007).

Anybody can develop cancer. Since the risk of being diagnosed with cancer increases as individuals age, most cases occur in adults who are middle-aged or older. About 77% of all cancers are diagnosed in persons 55 years and older (American Cancer Society 2007), but in this study the following was seen.

The ages of patients most frequently diagnosed with cancer according to this studies is between 36 and 55 years, with the average age of the patients being 45 ± 1.19 years. A factor like the age at which a woman first gives birth can increase or decrease a woman's chance of developing breast cancer. (Martin, et al 2003). Seventy-two percent of the patients in this study were aged 36 years and above. This is lower than it is seen in developed countries because of poverty and exposure to more carcinogens in the environment.

Women under the age of 30 years are rarely diagnosed with breast cancer, but the incidence rate increases dramatically after the age of 30 years and plateaus around the age of 50 years (Suzanne et al, 1996)

5.2 Family /Marital History of cancer patients

Seventy-nine percent of the patients visiting the Oncology clinic are married. This is expected because the average age of the patients is 45 years, and also most of the patients marry early, because of the culture in the northern part of the country (Nigeria). Another factor is that the females make 63% of the patients.

5.3 Educational level of patients

Sixty-four percent of the patients have no formal education. This is so because most of the patients visiting this clinic are women (64%), and also most of them are from the northern part of this country where western education is not given preference over the non-formal education. Housewives constitute 64% of the patients.

5.4 Family history of cancer

Although inherited genes do influence cancer risk, heredity alone does not explain the occurrence of all cancers. Most of the variation in cancer risk across populations cannot currently be explained by inherited factors only. Behavioral factors such as cigarette smoking, certain dietary patterns, physical activity, and weight control can substantially affect the risk of developing cancer negatively (American Cancer Society 2007).

Environmental (as opposed to hereditary) factors account for an estimated 75% -80% of cancer cases and death in the United states (American Cancer Society 2007), 77% of our patients have no family history of cancer. It can therefore be said that other risk factors for cancer are responsible for most of the cancer cases seen in this hospital.

Women with a first-degree relative (e.g., mother and / or sister) with breast cancer have two-fold to three-fold increase risk of developing breast cancer (Hutchins 1990, Henderson 1989). This risk may be increased further if more than one first-degree relative is diagnosed with the disease, the relative is a younger age at the time of diagnosis, or the relative

presents with bilateral breast cancer (Suzanne et al 1996). Patients who have breast cancer as part of family syndrome are frequently diagnosed at an earlier age, and the disease is often bilateral. Recent research has revealed a gene on the long arm of chromosome 17 known as BRCA1,which is responsible for an inherited predisposition to breast and ovarian cancer (Lemoine, 1994).

5.5 Pain description

Ninety-one (35%) of the patients stated that pain was not constant but it was present every day. And 86 (33.1%) replied that their pain was not present every day.

Most patients experience pain more at night. This is so because patients tend to experience more pain when they are less distracted. Rest, sleep and diversion have been reported to raise pain threshold (Bitros, 2005)

5.6 Effect of pain on sleep

Patients experiencing pain during the studies (i.e. after initiation of therapy), only 12 said they are sometimes awakened from sleep by pain, and none of the patients said they were always awakened by pain. It is important to take into account common co-morbidities, such as sleep disturbances and depression, which can affect pain levels (Chang, 2004, Miller 2001)

Many patients experiencing moderate to severe pain during the study showed a significant decrease in the level of their pain. A Numerical Rating Scale (NRS) was used to asses pain before and during therapy. In the NRS, mild pain ranges from 1 to 4, moderate pain from 5 to 6 and severe pain from 7 to 10. A NRS score rated as 4 or more is an indicator of poor pain control; in these cases, the dose of analgesic should be increased or another drug

added. Pain rated as 5 or above is considered substantial and interfering with the quality of life. (Caraceni, 2002).

Before the initiation of therapy (anticancer and analgesic), most patients experience moderate pain. During therapy almost all the patients experience only mild pain with some still experiencing pain of moderate intensity. Probably at this point pain is mostly associated with antineoplastic therapy and anxiety.

5.7 Pattern of drug use

In Africa, where there have been a few reports about the status of opioid availability, (Beck 1998, Joranson 1998, Ajayi et al, 2000) how does the consumption of morphine compare to the rest of the world? In 1999, the mean consumption of morphine for all the countries of the world was only 5.9 milligrams per capita (mg/capita). The top consumers were twelve industrialized countries that used from 20 to 75 mg/capita. The rest of the countries used less than 20 mg/capita. The mean consumption of morphine for the African region was the lowest of all the WHO regions of the world, at 0.7 mg/capita. South Africa ranked the highest at 3.4 mg/capita.

Analgesic medication use is generally low. Most of the patients taking analgesics for the relief of their pain use the Non Steroidal Anti Inflammatory Drug (NSAID), Diclofenac. Although opioids analgesics, a class of naturally derived and synthetic drugs, represent the mainstay of cancer pain therapy, and may be classified according to their receptor profile: as agonist, partial agonist, or agonist–antagonist. (Pasquale et al 2005).

The anticancer agents most commonly used are the **antimetabolitess** (5-flourouracil) that interferes with the incorporation of nucleic acid bases into DNA; their activity peaks during the S phase of the cell cycle. The next class of anticancer agents is the **Alkylating drug** (cyclophosphamide), which forms linkages between the strands of DNA that prevent this biogenic substance from separating during the M phase of the cell cycle. **Antitumor antibiotic** (doxorubicin hydrochloride) typically interfere with binding of base-pair molecules and prevent separation of DNA strands during the M phase of the cell cycle. (Kim et al 2005).

A study by Adesunkanmi et al showed that drug combinations for breast cancer were CMF—cyclophosphamide, methotrexate, 5-fluorouracil, CMFP—CMF plus prednisone, and CAF—cyclophosphamide, adriamycin, 5-fluorouracil), tamoxifen was administered in all the patients (Adesunkanmi et al).

Ampicillin and Cloxacillin combination, Ciprofloxacin and Metronidazole are the commonly used antibiotics in the Oncology clinic to treat associated infections.

Because some of the patients are also on radiotherapy, and they need to maintain a Packed Cell Volume (PCV) of 34% or above they are placed on haematinics to help in haematopoiesis. Ferrous sulphate and vitamin B-complex are the commonly used haematinics.

Corticosteroids have been termed "general purpose" adjuvant analgesics. Corticosteroids provide mood elevation, anti-inflammatory activity, antiemetic activity and appetite stimulation. (US Department of Health and Human Services 1994). Painful conditions that commonly respond to corticosteroids include raised intracranial pressure, acute spinal cord compression, metastatic bone pain, neuropathic pain due to infiltration or compression by a

tumor, and symptomatic lymph edema. Advanced cancer patients who experience pain generally respond to low-dose steroids (e.g., dexamethasone 1–2 mg bid) (WHO, 1996 and Cheny et al 1994)

5.8 Types of cancer

The most common cancers in Nigeria are carcinoma of the uterine cervix and breast for women and liver and prostate cancers for men (Adebamowo, 2007).

5.8.1 **Cervical cancer**

The study showed that the most common type of cancer in the Oncology Clinic of ABUTH Shika-Zaria is cancer of the cervix. It accounted for about 27.6% of all the cancer cases in the clinic. The average age of patients with cancer of the cervix was 46.7 ± 1.89 years. This accounts for 43% of the cancer amongst females seen in this clinic. The mean age at occurrence of cancer of the cervix at Olabisi Onabanjo University Teaching Hospital, Sagamu, Nigeria between January 1991 and December 2000 was 51.7 + 12.4 years (Olatunji and Sule-Odu, 2005).

Cervical cancer is the second most common cancer in women under 35 years. In 2004, 1,093 women in the UK died from the disease. (BBC HEALTH 2006). Cancer of the cervix is diagnosed in women younger than 50 (63%) than in women 50 and older (38%) (American Cancer Society 2007). Carcinoma of the cervix accounted for 63.1% of histologically confirmed gynaecological cancers in Ilorin Nigeria. Most of the patients were married 147 (98.7 %) and of low socio-economic status 132 (88.6%). One hundred and three (89.1 %) patients were in the age bracket 40-69 years with highest frequency in 40-49 years age group. The disease is associated with high parity with grandmultiparous patients constituting 119 (79.9 %) of the cases (Ijaiya et al 2004).

Studies elsewhere show cancer of the cervix to be the third most common female genital cancer in the United states (Boring et al 1994). The peak incidence of cervical cancer is between 48 and 55 years of age, the majority of invasive cancer occurring after age 35 (Hoskins et al 1993). Cervical cancer is more common in underdeveloped and low-socioeconoic-level population. It is associated with sexual intercourse at a younger age, multiple sexual partners, pregnancy at a young age, multiple pregnancies, and cigarette smoking (Hoskins et al 1993).

5.8.2 **Breast cancer**

Next to cancer of the cervix in terms of prevalence is cancer of the breast (24.8%). The mean age of the patients with breast cancer in this study was 43 ± 1.80 years.

The mean age at presentation of women with breast cancer was 43.1 and 64 years for Jos (Nigeria) and Norfolk (United Kingdom), respectively. The age specific incidence rates were higher in women above 50 years compared to women less than 50 years of age in both populations (Isaac et al, 2006)

Studies elsewhere have shown other cancer types to be more common. Breast cancer is among the leading chronic conditions affecting adult women (Carol, et al 2006). The same study by Carol et al also showed that excluding skin cancers, breast cancer is the most common malignancy among women, accounting for nearly one in three cancers diagnosed among women in the United States; it is the second leading cause of cancer death.

Risk factors include having a family history of breast cancer, particularly in mother or siblings; a past medical history of breast cancer , ovarian cancer, uterine cancer, or colon cancer; early menarche (start of menstruation before age 12 years) and/or late menopause (after age 55 years); no pregnancies or a first pregnancy after age 30 years; and radiation

exposure. Post-menopausal estrogen therapy and oral contraceptive use (such as estrogens and progestin oral contraceptives) are considered possible risk factors.

5.8.3 **Prostate cancer**

Prostate cancer accounts for 1.6% of cancer cases, with the average age of the patients was 65 years. More than a quarter of a million males are diagnosed with prostate cancer each year. Most of them are elderly, the average age at diagnosis is 70 years. Prostate cancer is highly curable when it is still localized to the prostate gland (Carol, 1996). Mean age of patients with prostate cancer in Nigeria plus or minus standard deviation was 68.3 +/− 9.4 years (Osegbe, 1997). Prostate cancer incidence and the magnitude of the risk in our population may have been grossly underestimated. The clinical prostate cancer rate in Nigerians may be as great as that noted in black men in the United States, which may suggest a common genetic predisposition.

Family history is also important in prostate cancer. Men with a single first degree relative with the disease have a 2-fold risk of developing it themselves. Men with 2 or more first degree relatives involved, have a 4-5-fold risk. Consumption of a diet rich in red meat and saturated fat appears to increase risk, particularly of aggressive disease (Gallagher and Fleshner 1998).

For unclear reasons incidence rates are significantly higher in African American men than in white men. The only well established risk factor for prostate cancer are age, ethnicity and family history of the disease. More than 65% of all prostate cancer cases are diagnosed in men 65 years and older (American Cancer Society 2007).

5.9 HEALTH CARE PROFESSIONALS (H.C.P) QUESTIONNAIRE

There are several surveys showing that physicians, nurses, and pharmacists express concerns about addiction, tolerance, and side effects of opioids (Lasch et al, 2002). These fears are pervasive among patients and family members as well. Studies have suggested that these fears lead to undermedication and increased pain intensity. (Potter et al, 2003)

The discussion below shows how the Health Care Professionals answered the questionnaire and the results are presented in percentages.

S 1 Pain management is important because unrelieved pain has a devastating impact on the physical and economic well being of patients and their families.

For this statement all the Doctors (100%) strongly agree, 71% of the Nurses strongly agree, while only 20% of the Pharmacists agree strongly.

American Pain Society holds the view that uncontrolled pain is an enormous public health problem worldwide. Diagnosis and treatment of pain is, therefore, fundamental to the public health. Many medical and regulatory organizations have recognized the imperative to relieve pain in official statements and guidelines. (American Pain Society, 1999).

S2 The primary goal of pain management is to enhance quality of life.

60%, 71%, and 40% of the Doctors, Nurses, and Pharmacist strongly agree to this statement. With these responses, it is worth knowing that, the primary goal of pain management is not just to enhance quality of life, but also to reduce pain and suffering, and

increase the ability to function- all while minimizing the risk of adverse effects. (Miaskowski et al, 2004).

S3 Opioid analgesics can be used to treat chronic nonmalignant pain.

There are many approaches to treating chronic pain that should be considered based on a comprehensive assessment of the pain syndrome and its impact, the level of disability, and the existence of medical and psychiatric co morbidities. In some cases, specific treatment targeting the cause of the pain is available and appropriate. For example, good glycemic control is central to the treatment of painful diabetic neuropathy.

Opioid therapy is accepted around the world as the most important approach to managing severe, acute pain, moderate to severe chronic cancer pain, and moderate to severe chronic pain caused by other life-threatening diseases. The use of opioid therapy to treat chronic nonmalignant pain has been more controversial and is still being actively discussed by medical experts. (Graven, 2000).

20% of Doctors and 30% of Pharmacists disagree that Opioid analgesics can be used to treat chronic nonmalignant pain, while no nurse disagrees with this statement.

*S4 The **most common** side effects associated with opioid therapy include itching, dry mouth and sexual dysfunction.*

20% of the Doctors, 14% of the Nurses and up to 50% the Pharmacists disagree with this statement. We expect the professional to disagree with the statement because itching, dry

mouth and sexual dysfunction though are side effects of opioid therapy , are not the most common.

It is very important that HCP anticipate, recognize, and treat side effects when patients are receiving opioids for pain. Side effects at the start of therapy or after dose escalation include fatigue; itching; adverse mood change; dry mouth, loss of appetite, bloating, or heartburn; urinary hesitancy; sweating; sexual dysfunction; and headache. Although any side effect can persist, the most common long-term side effect is constipation. (American Pain Society 2003).

S5 More than one opioid at a time can be prescribed to a patient.

In the treatment of cancer pain, the typical approach involves the prescription of a long-acting opioid to relieve baseline pain plus a short-acting opioid to be taken as needed for episodes of breakthrough pain. Many pain specialists now apply this approach to the management of chronic noncancer pain. (Anderson, 2001)

20% of Pharmacists, 40% of Doctors and 57% of the Nurses agree. It is expected that more of the HCP agree with the statement.

S6 A written agreement is needed between a clinician and the patient before starting treatment with an opioid.

To this statement, only 10% of the Pharmacists, 14% of Nurses also agreeing while no Doctor agreed with this. A written agreement should be encouraged because patients are also suppose to know the tendencies of these opioids causing addiction, dependence and the development of tolerance. Patients should be asked whether they are concerned about addiction and tolerance (often described as becoming "immune" to the drug) (Paice et al, 1998). Sixty percent of the Doctors and also 60% of the Pharmacists disagree.

Written agreements should advance a positive therapeutic relationship, reflect a willingness to have an open dialogue about the responsibilities and risks associated with opioid therapy, and contain clear and accurate information and instructions for the patient. (Gitlin, 1999)

S7 You can prescribe/ dispense/ administer long-term opioid therapy for pain to a patient with history of drug abuse.

Those patients who are actively abusing substances, pose great challenge. These patients require care of an advanced nature, which may not be available in the primary care setting. Referral of such patients to an addiction medicine specialist is appropriate. Generally, there is no prohibition to the use of opioids to treat pain if a patient is abusing controlled substances. (Gilson, 2002)

Only 30% of the Pharmacists agree with above statement while all the Doctors and all the Nurses do not agree with it. We expect the HCP to agree with the statement because even though the patient abuses the drugs, he should still be treated under the supervision of a specialist. Eighty percent of the Doctors disagree. One should expect 100% strong agreement from HCP.

S8 All healthcare professionals must be licensed to prescribe, dispense and or administer opioid analgesic.

20% 0f the Pharmacists, 40% of the Doctors and 29% of the Nurses strongly agree. Opioids are prescription drugs, and for any person to prescribe dispense and or administer these drugs he/she must be licensed. Fifty percent of the Pharmacists strongly disagree.

S8 Opioid rotation is a strategy that addresses the occurrence of intolerable side effects during opioid therapy.

Opioid rotation refers to a switch from one opioid to another. It is a common strategy to address the occurrence of intolerable side effects during opioid therapy. When a switch is made, the starting dose of the new drug is selected based on the information in an "equianalgesic dose table". (Anderson, 2001).

Almost all the Pharmacists (80%), 60% of the Doctors, and only 29% the Nurses agree with the comment. Adequate knowledge of opioids should include a thorough understanding of their side effects, to which opioid rotation addresses. Twenty eight percent of the Nurses strongly agree

S10 It is possible to initiate the use of opioid therapy as a trial in patients

The observation that opioid therapy can be discontinued without uncomfortable abstinence by carefully tapering the dose supports the view that opioid therapy can be initiated as a trial. (Gitlin, 1999).

50% of the Pharmacists, 80% of the Doctors and 43% of the Nurses agree. Responses by the HCP to this statement is satisfactory because it is true you can initiate trials with opioids.

5.10 Cost implication of cancer pain management

The control of health expenditure is a very important aspect of health policy. Pharmacoeconomic studies which are concerned with identification and estimation of overall cost of a particular disease on a defined population as well as provide economic estimates that can be used by policy makers and administrators to guide their resource allocation decisions. These studies are indispensable tools for determining the economic

impact of disease, and for assigning resources (material and human), required for prevention, diagnosis, and treatment of patients with different diseases.

Patients visiting the clinic receive radiotherapy, chemotherapy and some had to undergo surgery. Also there were patients that had the three treatment mentioned above. During the period of the study, 124 (47.7%) patients were on radiotherapy. The cost of radiotherapy for each patient was about ₦20,150:00, the total cost of radiotherapy for these patients was projected to be ₦2,498,600:00. For the patients that received chemotherapy, the cost of antineoplastic agents was about ₦5,413,980:00 (six courses) and the cost of chemotherapy consumables (surgical gloves, syringes and needle, and cotton wool) ₦500:00/patient/day was about ₦701,000;00 this gives a total of ₦6,114,980:00. The laboratory investigations in the chemical pathology was ₦5,100:00 for each patient (first request only) and gave a total of ₦1,326,000:00 (for 260 patients). Haematology laboratory cost was ₦204,350:00 this covers cost of blood (for surgery patients) cost of Packed Cell Volume (PCV), HIV screening and blood grouping (first request only). The total cost of laboratory investigation (chemical pathology and haematology) was ₦1,530,350:00. Two hundred and fifteen (82.7%) of the patients were prescribed pain reliving medications (analgesics) with an average cost of ₦290,160:00. Fifty-seven (21.9%) of the patients had surgery and cost of surgery was ₦1,781,535:00 (₦31,255:00/patient) and the cost of anaesthesia drug and gases was ₦ 655,500:00 (₦11,500:00/patient), and because the patients that had surgery will had to be on admission before and after surgery, the admission cost for the surgery patients was found to be ₦ 342,000:00 (₦6,000/patient). The cost of specialized investigation (abdominal CT 86 patients and mammography 62 patients) was ₦3,134,000:00 So, the cost of treatment (surgery, radiotherapy, chemotherapy, analgesics,

specialized investigation and laboratory investigations) was ₦16, 347,125:00 sixteen million three hundred and forty-seven thousand one hundred and twenty five.

The American National Institute of Health estimate overall cost of cancer in 2006 at $78.2 billion for direct medical cost (total of all health expenditure) (American Cancer Society 2007). The cost of treatment for breast cancer in developing countries is < or = 5% of that in developed regions (Radice and Radaeli 2003).

CHAPTER SIX

6.0 SUMMARY

The findings of the study showed that, majority of the patients attending the Oncology clinic of ABUTH Shika-Zaria were women (64%). Cervical and breast cancers were the most prevalent cancer types at the clinic. Seventy nine percent of the patients were married and eighty two percent of the women were housewives. More than half do not have a family history of cancer, and about 64% of the patients have no western education.

The patients that were experiencing pain, after the initiation of therapy 15% of them received Diclofenac for pain relief. The most common antineoplastic agents used in the clinic are 5-flourouracil, doxorubucin hydrochloride and cyclophaophamide. Dexamathasone was the most frequent adjuvant drug used. Patients described their pain as being present every day, but the pain was not constant. Also, patients said the pain was present mostly at night but did not prevent them from sleeping. The patients also reported a significant decrease in the level of their pain; as most of them initially complained of moderate to severe pain, but now only mild pain was experienced, at the time of the study.

The total cost of managing pain in the patients (used in this study) seen at ABUTH Oncology clinic during the period of the study was ₦16,347,125:00. This covered cost of surgery, radiotherapy, chemotherapy, analgesics, specialized investigation and laboratory investigations (i.e. direct cost only).

The Health Care Professionals responded well to their questionnaire.

6.2 Conclusions and Recommendations

Pain is effectively managed in the oncology clinic, since there is a decrease of pain from moderate – severe intensity to pain of mild intensity.

Cancers of the cervix and breast are the most common forms of cancer among women.

Health Care Professionals should be less concerned with issues of addiction and development of tolerance at this point of the terminally ill patients. They should focus more attention relieving the patient's pain first.

Cancer statistics in the clinic and the country at large needs to be known, and this can only be done when large-scale multicentre studies is undertaken to cover the whole region or country. More information is required on prevalence of the disease, incidence of new cases, and death rates from cancer and prevention strategies.

Attention should be drawn to the fact cancer pain is an issue of concern. Management of pain in cancer patients is an area that is often neglected. More screening centers should be established so as to detect the disease earlier and increase survival rate in patients with cancer.

TABLE 4.4 RESPONSES BY HEALTH CARE PROFESSIONALS IN PERCENTAGES.

	Strongly disagree	Disagree	Not sure	Agree
The primary goal of pain management is to enhance quality of life				40 D 29 N 60 P
Opioid analgesics can be used to treat chronic nonmalignant pain.	- - 10 P	20 D - 30 P	- - 10 P	60 D 29 N 40 P
The most common side effects associated with opioid therapy include itching, dry mouth and sexual dysfunction.	- 29 N -	20 D 14 N 50 P	60 D 43 N 20 P	20 D - 20 P
It is possible to initiate the use of opioids therapy as a trial in patients	- 29 N -	- 14 N 50 P	20 D - -	80 D 43 N 50 P
More than one opioid at a time can be prescribed to a patient.	20 D 29 N 10 P	40 D 14 N 70 P		40 D 57 N 20 P
Pain management is important because unrelieved pain has a devastating impact on the physical and economic well being of patients and their families				- 29 N 80 P

TABLE 4.4 CONTINUES

	Strongly disagree	Disagree	Not sure	Agree
A written agreement is needed between a clinician and the patient before starting treatment with an opioid.	20 D 29 N 10 P	60 D 29 N 60 P	20 D 14 N 20 P	- 14 N 10 P
You can prescribe/ dispense/ administer long-term opioid therapy for pain to a patient with history of drug abuse.	20 D 43 N 30 P	80 D 14 N 40 P	- 43 N -	- - 30 P
All healthcare professionals must be	-	20 D	20 D	20 D

licensed to prescribe, dispense and or administer opioid analgesic.	- 50 P	14 N 30 P	14 N -	43 N -
Opioid rotation is a strategy that addresses the occurrence of intolerable side effects during opioid therapy.		- 14 N 10 P	40 D 29 N 10 P	60 D 29 N 80 P

Key: D=Doctors P=Pharmacist N=Nurses

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APPENDIX A

QUESTIONNAIRE FOR HEALTH CARE ROFESSIONALS

1. Age **(a)** less than 26 ( ) **(b)** 26-30 ( ) **(c)** 31-35 ( ) **(d)** 36-40 [ ] **(e)** 41-45 ( ) **(f)** 46-50 [ ] **(g)** Above 50 [ ]

2. Gender

(a) Male [ ] (b) Female [ ]

3. Profession

(a) Medicine [ ] (b) Pharmacy [] (c) Nursing [

4. Years of Experience/Practice

(a) Less than 5 [ ] (b) 5-9 [ ] (c) 10-14 [ ]

(d) 15-19 [ ] (e) 20 and above [ ]

5. Rank (write as appropriate)

SECTION II

Tick only one option

You can prescribe/ dispense/ administer long-term opioid therapy for pain to a patient with history of drug abuse.

All healthcare professionals must be licensed to prescribe, dispense and or administer opioid analgesic.

Opioid rotation is a strategy that addresses the occurrence of intolerable side effects during opioid therapy.

Strongly disagree	Disagree	Undecided/ Not sure	Agree	Strongly Agree

It is possible to initiate the use of opioids therapy as a trial in patients					
Pain management is important because unrelieved pain has a devastating impact on the physical and economic well being of patient's and their families					
The primary goal of pain management is to enhance quality of life.					
Opioid analgesics can be used to treat chronic nonmalignant pain.					
The most common side effects associated with opioid therapy include itching, dry mouth and sexual dysfunction.					
More than one opioid at a time can be prescribed to a patient.					
A written agreement is needed between a clinician and the patient before starting treatment with an opioid.					

APPENDIX B

QUESTIONNAIRE SAMPLE FOR PATIENTS
SECTION 1

1. **Gender**

   (a) Male [ ] (b) Female [ ]

2. **Age (years)**

3. **Family Status** (a) Unmarried [ ] (b) Married [ ]
   (c) Divorced/separated[ ] (d) Widowed [ ]

4. **Educational level** (a) Primary school (b) Secondary level
   (c) Tertiary education (d) No formal education

5. Which of the following best describes your current job status

   (a) Civil servant (b) home maker
   (c) Student (d) Business
   (e) Unemployed (f) retired

6. How many hours do you work in a day?

7. How long you have had pain?

   _____

8. How long have been in the hospital?

   _____

9. Causes of your pain. Check those that apply

(a) Accident at work (b) Accident at home
(c) Other accident (d) Following illnesses
(e) Following Surgery (f) Pain “just started”
Other (please explain) _____

10. What type of cancer do you suffer from?
11. Have you ever smoked cigarette?
12. Have ever taken alcohol?
13. Have you ever used oral contraceptives? (Applicable to women)
14. Has any member of your family had cancer?

15. Present Pain Medication Use:

Medication	**Dose**	**How Often**

16. Side effects experienced with above medications. Check all that apply

(a) Constipation (b) Sleepiness (c) Nausea

(d) Dizziness (e) Others ……..specify

17. **Pain description**

(a) Constant

(b) Not constant, but present about _____ times a day

(c) Not present every day, but present about _____ times, a week

18. Present pain Pattern – please describe your pain throughout the day:

Morning: Duration _____ constant or intermittent

Afternoon; Duration _____ constant or intermittent

Evening; Duration _____ constant or intermittent

Night; Duration _____ constant or intermittent

19. Has your mood changed since your pain began?

(a) Yes (b) No

20. What effect has your pain had on your sleep?

(a) Trouble falling asleep always sometimes never

(b) Medication needed to fall asleep always sometimes never

(c) Awakened by pain always sometimes never

21. The following may increase or decrease your pain. Please indicate + (increase) or – (decrease) beside each item (0 for no effect).

_____ Sleep, rest _____ Urination, defecation

_____ Lying down _____ Mild exercise

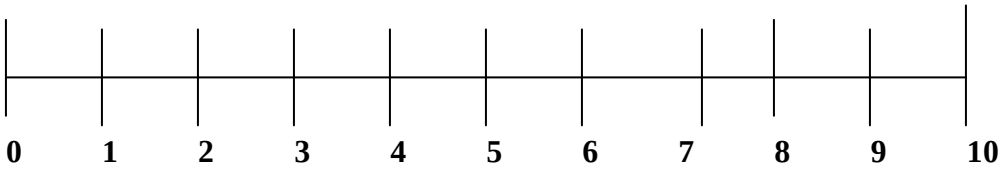
_____ Distraction (TV, etc) _____ Fatigue

_____ Heat _____ Cold

_____ Movements

22. I n the figure below please indicate the level of your pain

Numeric Pain Rating Scale



No pain **Moderate Pain** **Worst possible Pain**

APPENDIX C

SAMPLE SIZE DETERMINATION

In order to determine the number of patients to be interviewed, the total number of clinic visits for a period of one year was found to be 3,869. And from this total clinic visits, number of patients visiting the clinic was 730.

The formular for determining sample size to be interviewed was applied as below:

Using the sample size formular (for population greater than 10,000)

$$n = \frac{Z^2 P q}{d^2}$$

$$n = \frac{(1.96)^2 (0.5) (0.5)}{(0.05)^2} = 384$$

Where:

n = The desired sample size (when population is greater than 10,000).

Z = the standard normal deviate, usually set at 1.96 (or more simply at 2), which correspond to the 95% confidence level.

P = The proportion of the target population estimated to have a particular characteristic. If there is no reasonable estimate, then use 50% (i.e.;0. 50).

$q = 1.0 - p$

d = degree of accuracy desired usually set at 0.05 or occasionally 0.02 (Araoye, 2004)

Now, using the formular for calculating sample size when population size is less than 10,000 (i.e.; 730)

$$nf = \frac{n}{1 + \frac{(n)}{(N)}}$$

$$nf = \frac{384}{1 + \frac{384}{730}} = 256$$

Where:

nf = the desired sample size when population is less than 10,000

n = the desired sample size when the population is more than 10,000

N = the estimate of the population size

The sample size was determined to be 256. A total of 260 patients were interviewed. The percentage of female patients was found to be 63%, while that of male patients was 37%. Therefore 164 female and 96 male patients were interviewed.

TABLE 4.4 RESPONSES BY HEALTH CARE PROFESSIONALS IN PERCENTAGES.

	Strongly disagree	Disagree	Not sure	Agree
The primary goal of pain management is to enhance quality of life				40 D 29 N 60 P
Opioid analgesics can be used to treat chronic nonmalignant pain.	- - 10 P	20 D - 30 P	- - 10 P	60 D 29 N 40 P
The most common side effects associated with opioid therapy include itching, dry mouth and sexual dysfunction.	- 29 N -	20 D 14 N 50 P	60 D 43 N 20 P	20 D - 20 P
It is possible to initiate the use of opioids therapy as a trial in patients	- 29 N -	- 14 N 50 P	20 D - -	80 D 43 N 50 P
More than one opioid at a time can be prescribed to a patient.	20 D 29 N 10 P	40 D 14 N 70 P		40 D 57 N 20 P
Pain management is important because unrelieved pain has a devastating impact on the physical and economic well being of patients and their families				- 29 N 80 P

TABLE 4.4 CONTINUES

	Strongly disagree	Disagree	Not sure	Agree
A written agreement is needed between a clinician and the patient before starting treatment with an opioid.	20 D 29 N 10 P	60 D 29 N 60 P	20 D 14 N 20 P	- 14 N 10 P
You can prescribe/ dispense/ administer long-term opioid therapy for pain to a patient with history of drug abuse.	20 D 43 N 30 P	80 D 14 N 40 P	- 43 N -	- - 30 P
All healthcare professionals must be	-	20 D	20 D	20 D

licensed to prescribe, dispense and or administer opioid analgesic.	- 50 P	14 N 30 P	14 N -	43 N -
Opioid rotation is a strategy that addresses the occurrence of intolerable side effects during opioid therapy.		- 14 N 10 P	40 D 29 N 10 P	60 D 29 N 80 P

Key: D=Doctors P=Pharmacist N=Nurses