ORPHINE USAGE IN THE MANAGEMENT OF PAIN BY DOCTORS IN PHOLOSONG HOSPITAL, GAUTENG, SOUTH AFRICA

By

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DEDICATION

This effort is dedicated to my precious wife, Prof. Dr. Annie K.T. Nzale Nzali, and my wonderful children who have been my strongest support throughout.

DECLARATION

I, Dr. Arnold N. NZALE NZALI, hereby declare that the work on which this dissertation/thesis is based is my original work (except where acknowledgements indicate otherwise) and that neither the whole work nor any part of it has been, is being, or is to be submitted for another degree in this or any other university.

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ACRONYMS AND ABBREVIATIONS

A&E - Accident and Emergency

AIDS - Acquired immunodeficiency syndrome CEO - Chief Executive Officer

CHC - Community Health Centre CP - Chronic pain

FDA – Food and Drug Administration GP – General practitioner

HIV - Human immunodeficiency virus HCW- Health care worker

IASP - International Association for the Study of Pain INCB - International Narcotic Control Board

MDR-TB - Multiple drug resistance tuberculosis MO - Medical Officer

MP - Medical Practitioner

NGO - Non-Governmental Organisation PASA - Pain Association of South Africa

PMTCT - Prevention of Mother To Child Transmission PTB - Pulmonary tuberculosis

RSA – Republic of South Africa UCT - University of Cape Town UHC –Universal Health Coverage USA - United States of America US - United States

WHA - World Health Assembly WHO - World Health Organization

DEFINITION OF TERMS

Drug diversion

Refers to the illicit transferring of medicines from legitimate use to illegal non-medicinal use through marketplaces and often involves brokering.[1]

Epidemiology

A science that deals with the incidence, distribution, and determinants of health for possible control of disease and other health-related factors.

General Practitioner

Refers to a registered medical practitioner in private practice

Health Care Worker

A broad term refers to one who delivers care and services to the sick and ailing such as directly as doctors and nurses or indirectly as aides, helpers, laboratory technicians, allied professionals, or even medical waste handlers. It could include any individual who is employed in the provision of health services.

Medical Practitioner / Doctor

Refers to a registered doctor with the Health Professions Council of South Africa and could be a medical officer in the public sector like the hospital under study or a medical specialist. It will be used interchangeably with the word “doctor” in this study.

Opioid crisis

Limited access to opioid medication for pain relief results in serious health-related suffering worldwide. Also refers to the situation which resulted in increased deaths due to opioid use and abuse in the United States of America.

Pain

A self-reported and subjective feeling of discomfort physically, emotionally, socially, culturally, and spiritually.[1]

Palliative care

WHO defines palliative care "as an approach that improves the quality of life of patients and their families facing the problem associated with life-threatening illness, through the prevention and relief of suffering using early identification and impeccable assessment and treatment of pain and other problems, physical, psychosocial, and spiritual."[2]

"Palliative care:

- provides relief from pain and other distressing symptoms;
- affirms life and regards dying as a normal process;
- intends neither to hasten nor postpone death;
- integrates the psychological and spiritual aspects of patient care;
- offers a support system to help patients live as actively as possible until death;
- offers a support system to help the family cope during the patient's illness and in their bereavement;
- uses a team approach to address the needs of patients and their families, including bereavement counselling, if indicated;
- will enhance the quality of life, and may also positively influence the course of illness; and
- is applicable early in the course of illness, in conjunction with other therapies that are intended to prolong life, such as chemotherapy or radiation therapy, and includes those investigations needed to better understand and manage distressing clinical complications."

Prevalence

The number of affected persons in the target population at a point in time divided by the number of persons in the population at the same prevailing time.

Suffering

A feeling of undergoing something bad, unpleasant, pain, distress, or hardship in the body or mind. It is something pressing a person below the usual well-being to which one must submit or bear. In this study, the researcher shall distinguish suffering from pain, even if it may be associated.

ABSTRACT

Introduction: The World Health Assembly reiterated the ethical duty of healthcare professionals to alleviate pain and suffering. However, in many countries, the appropriate use of opioids for the relief of pain and suffering remains insufficient. Also, the World Health Organisation acknowledged insufficient skills regarding pain management among healthcare workers. It reaffirmed that morphine use was capable of relieving pain in more than ninety per cent (90%) of cancer patients when used correctly.

Aim: to explore doctors' perceptions of morphine usage for pain management in Pholosong Regional Hospital in Ekurhuleni, Gauteng Province, South Africa.

Objectives: 1. To identify the doctors' perceptions of morphine and its use in pain management among their patients. 2. To identify factors associated with the usage of morphine in Pholosong Regional Hospital

Methodology: The study was a descriptive cross-sectional study conducted by surveying doctors at Pholosong Hospital.

Results: For most doctors, eighty-three per cent (83%) completed the questionnaires in full. Seventy-two per cent (72%) did not prescribe morphine to their patients. The older doctors tended to prescribe morphine less and were less skilled in morphine use. Nearly seventy per cent (70%) did not fear the side effects of morphine in their patients. Availability of morphine was reported by fifty per cent (50%) and half had received training in morphine prescribing.

Conclusions: Significant findings were that most doctors in the hospital had inadequate knowledge and were not skilled enough in morphine use for pain control in their patients. The finding was of concern because this perception suggests that pain control would be sub-standard in a significant proportion of adult patients managed in the hospital. It is a concern that patients' human rights of freedom from pain and dignity may be breached due to doctors' perceptions of morphine usage.

Recommendations include the urgent need to remedy the situation through team-based robust health promotion, doctors' in-service training, clinical guidelines, pain control tools, and making morphine accessible to all parts of the hospital.

Key-words: Morphine usage, pain management

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CHAPTER 1: INTRODUCTION

1.1. Introduction

This chapter introduces the importance of Morphine usage in managing pain in Palliative Care.

In advanced progressive diseases such as cancer, pain is a common problem. It has been reported that two-thirds of cancer patients needed a strong opioid such as morphine for their pain management and relief from suffering as reported by The Lancet Commission on Palliative Care and Pain Relief[1] and other authors such as Wee et al.[2] In addition, the quality of life of patients diagnosed with life-threatening illnesses can be improved through prevention and relief of suffering by utilising the palliative care approach including effective pain management. Provision of palliative care is a skill that ensures a comprehensive management of different factors associated with life-threatening illnesses and may include aspects of the psychosocial, legal, and spiritual realms.[3]

1.2. Palliative care and pain management: an ethical duty

The World Health Assembly Resolution 67.19 on palliative care states that "palliative care is an ethical responsibility of health systems, and that it is the ethical duty of health care professionals to alleviate pain and suffering, whether physical, psychosocial or spiritual".[4] Brennan and Cousins[5] described that medical ethics guiding pain relief is a good example of the bioethical principle of beneficence. The relief of pain and suffering is one of the core functions of the doctors' good actions and is an ethical duty. Further, doctors are prohibited from inflicting harm on their clients in the principle of nonmaleficence. Failure to treat a patient in pain causes harm and discomfort in pain sufferers. There are both physical and psychological effects on the patient if persistent inadequately treated pain is not managed well. This act of omission is a form of abandonment or even negligence.[5]

Brennan and Cousins further state that patient autonomy is breached if the patient's complaint of pain is overlooked or the healthcare worker refuses to accede to a reasonable request for pain relief. For a patient's doctor to ignore pain arguably contravenes the autonomy of patients and self-determination.

Indeed, unrelieved pain per se may affect, or even preclude the exercise of independence. It has a major impingement on a patient's ability to make choices if unrelieved pain is permitted to affect the patient.

Brennan and Cousins[5] describe resource discrepancies in different parts of the world as confounding the fulfilment of the ideal of pain management as a universal human right. One example of the broader problem of health disparities that arise due to inequity of socioeconomic status is unequal access to pain relief. The recognition, monitoring, and treatment of pain should be placed as a high priority by a competent doctor. To this end, the attributes of a virtuous doctor are to inquire regularly about pain, respond appropriately, and refer wisely if unable to control it.[5]

In addition, a United Nations Committee on Economic, Social and Cultural Rights (UNCESCR)[5], reports that states were under the obligation to respect the right to health by refraining "from denying or limiting equal access to health for all persons to preventive, curative and palliative health services."[6] The view of the United Nations Special Rapporteur[3] on torture and other cruel, inhuman, or degrading treatment or punishment is "that the de facto denial of access to pain relief if it causes severe pain and suffering, constitutes cruel, inhuman or degrading treatment or punishment."[3]

In a further publication, Brennan recommended that medicines, such as opioids, should be available to those who need them and educational programs on palliative care and pain management should be implemented at all levels of care, be it primary, secondary, or tertiary.[7,8]

1.3. WHO recommendations on pain relief

The WHO first placed cancer pain control on its official agenda in the 1980s and published a manual, 'Cancer Pain Relief,' in 1986.[9] Currently, the WHO plays a critical role in the worldwide recognition of pain control as a universal right. The WHO aims to ensure access to affordable opioids for medical use and foster national pain and palliative care programs. The most important task WHO undertakes on pain relief is to promote better pain control before the international community.

Hence, WHO developed the “pain-relief ladder”[9] to guide policymakers and healthcare workers in pain management, it is a simple three-step guide on pain management for people with chronic pain due to cancer. Furthermore, the WHO is recommending the identification and management of the psychological suffering of cancer patients. The aim of pain management at all levels of care is really to relieve the pain to the patient’s experience and satisfaction so that the patient can function optimally and eventually die free of pain.[9]

The WHO recommendation on cancer pain relief states that opioids are the cornerstone in the management of cancer pain[9]. Unfortunately, the fear of opioid use remains the biggest barrier to achieving good pain control and quality of care for patients. Some reports done by del Rey et al. in 2012[10], indicate that more than 1.5 billion people worldwide were reported to suffer from chronic pain and that approximately 3-4.5% of the global population suffered from neuropathic pain, with the incidence rate increasing complementary to age. Besides the standard pain medications and surgical interventions, a holistic approach that embraces the whole person is recommended, to address all aspects of the patient’s pain experience.[11,12]

1.4. Pain management and the use of morphine

The Oxford Textbook of Palliative Nursing describes pain control as ‘the cornerstone of palliative care.[13] In the treatment of moderate to severe acute and chronic pain, opioids have been the recommended medication of treatment. To exert an analgesic effect, opioids bind to various opioid receptors. They are used together with non-pharmacological and non-opioid analgesics such as paracetamol and nonsteroidal anti-inflammatory drugs as part of a multimodal approach to treating pain. Opioids are used when non-opioid therapies are no longer effective in treating moderate to severe acute pain. For chronic pain, opioids are often used to treat persistent pain in both non-cancer and cancer patients. However, the inappropriate use of opioids for the management of chronic pain together with the use of strong opioids as ‘recreational’ drugs rather than for medicinal purposes has resulted in deaths associated with opioid use as reported in the United States of America (USA).[14]

The US Centre for Disease Control has issued guidelines for the use of opioids in chronic pain including the recommendations that “nonopioid therapy is preferred for treatment of chronic pain;” and that “opioids should be used only when benefits for pain and function are expected to outweigh risks;” and that “clinicians should evaluate benefits and harms of continued opioid therapy with patients every three months or more frequently and review prescription drug monitoring program data.”[12]

Unfortunately, strict regulations on the use of opioid medication have resulted in many patients legitimately using opioids for the management of chronic pain being denied this effective pain management and experiencing severe pain again.[13] We need to recognize the report of the United Nations Special Rapporteur on Torture and other Cruel, Inhuman or Degrading Treatment or Punishment, Juan E. Méndez, who identified denial of pain relief as being “tantamount to torture.”[3] Ostgathe et al.[15] from the European Association of Palliative Care identified that the premise of the crisis of opioid deaths being due to the overuse of prescription medication was simplistic and overlooks the misuse of illicit and synthetic opioids. They identified that the response to the public health tragedy of opioid deaths restricted the legitimate use of opioids and might have a consequence of reducing access to opioids in developing countries that presently use less than 2% of opioids needed for pain control, as reported by the Lancet Commission on Palliative Care.[13]

Reports indicate that “opioids administered via oral, transdermal, and intrathecal routes were associated with clinically significant chronic pain reduction in non-cancer patients.”[2] However, there appears a shift in the management of non-malignant pain, for example in musculoskeletal disorders. The recommended current approach is to focus on both non-pharmacological and pharmacological approaches and the use of opioids for both chronic cancer and non-cancerous pain.[10]

Paice comments that of all the medications used to treat pain, morphine is perhaps the most misunderstood and feared although morphine is commonly used in hospices and palliative care.[10] Also, the safety and tolerability profile of morphine differs greatly depending on the route of administration, the individual

patient, and clinical conditions generally. The author further states that the consequences of adverse effects on the elderly can be very serious. Hence, the selected agent must have a good safety and tolerability profile for the central nervous and gastrointestinal tract systems. Treatment-related adverse events are common and must be managed effectively, these include constipation, nausea, somnolence, itching, and dizziness.[9]

Morphine (sulphate) is a natural opium alkaloid (Benzylisoquinoline) analgesic indicated for the relief of moderate to severe acute and chronic pain where the use of an opioid analgesic is appropriate.[16]

In a study done, there are different types of pain, and it can be: (i) Nociceptive: caused by ongoing tissue damage, either somatic (such as bone pain) or visceral (such as the gut or hepatic pain); or (ii) Neuropathic: caused by damage or dysfunction in the nervous system, such as in brachial plexopathy or spinal cord compression by tumour.[17]

Morphine is available in formulations for different routes of administration, depending on patient requirements **-** oral (tablets, capsules and extemporaneously prepared powder for oral solution), PR, and parenteral (SC, IM, IV, Intrathecal and Epidural administrations) solutions.[18]

In either immediate release or modified release form, it remains the analgesic of choice for moderate or severe cancer pain.[19]

If well tolerated, the oral route should be considered the preferred route of administration[20], as it is important to prescribe a therapy that can be managed simply by patients and families themselves.[21]

It is metabolised in the liver and its half-life is 2-4 hours for immediate release and 11-13 hours for Extended release, It is excreted by urine (2-12%) and faeces (7-10%).

Every case should be individualized, using non-opioid analgesics, opioids on an " as-needed basis'' and/or combination products, and chronic opioid therapy in a progressive plan of pain management such as outlined by the World Health Organization analgesic ladder.[9]

Wee et al.[2] and the WHO Guide to Cancer Pain Relief[9] state that when used

correctly, morphine therapy is capable of relieving pain in more than 90% of cancer patients. The side effects and precautions of morphine usage should be addressed to ensure patient comfort while using morphine for therapeutic purposes.

Patients suffering from severe chronic cancer or non-cancerous pain but not yet receiving opioid analgesics should be started on morphine sulphate in a gradual dosing range starting with morphine sulphate oral solution of 10 to 15 mg every 4 hours, as needed (and titrate upward slowly based on patient's response), followed by morphine sulphate tablets 15 to 30 mg every 4 hours when needed. "The dose should be titrated based upon the individual patient's response to their initial dose of morphine sulphate. This dose should then be adjusted to an acceptable level of analgesia considering the improvement in pain intensity and the tolerability of morphine by the patient."[9,20]

In South Africa, morphine is available and used in both public and private health sectors to control acute, moderate, and severe pain.[21] The regulations about the use of opioids in South Africa include prohibition from immediate driving and working under hazardous conditions or working with hazardous machinery and on heights after initiating or while titrating an opioid until the person is on a stable dose without sedation, then they are permitted to drive.[22] Patients must be advised to avoid alcohol or other sedative drugs because opioids cause somnolence, clouded mentation, decreased concentration, incoordination, or slower reflexes. The researcher observed on many occasions that one of the biggest pain management challenges in clinical settings was to get healthcare practitioners to prescribe morphine confidently to patients who experienced severe pain. The result was that many patients suffered from untreated pain.

1.5. Knowledge of pain management among healthcare workers

Pain is one of the most common reasons that people consult their doctors.[23] and it is also one of the main symptoms which warrants attention in the palliative care setting.

Hence, all clinicians should be skilled in assessing and controlling all forms of pain.[8]

However, if healthcare workers are trained and become skilled in the field,

palliative care can be practised at home or in the community, in an institution or hospital, and anywhere else.

The required standard of a reasonable healthcare practitioner is that pain should be promptly addressed and managed by the attending practitioner.

The complexity of pain encompasses a wide spectrum of disorders including acute and chronic pain, nociceptive and neuropathic pain and sometimes a combination of these. Pain medicine is a medical subspecialty concerned with the prevention, evaluation, diagnosis, treatment, and rehabilitation of patients with acute, and chronic cancer and non-cancerous pain.[5] However, every clinician should have the knowledge and skills to assess and manage pain and to refer to pain specialists if pain persists. The introduction of formal pain management training and palliative care in many parts of the world is a promising step for improved care for patients living with serious illnesses, especially those with moderate to severe pain[21]. It is encouraging to note that since this research study was conducted, the Pain Society of South Africa (PainSA) has implemented a programme on training in pain management in every province of South Africa. The programme is Essential Pain Management and has been taught at annual training meetings in each province and is available online.[24]

A critical step to providing good pain management is a good pain history taking and comprehensive assessment. According to Aly and colleagues[25], lack of pain assessment was one of the most problematic barriers to achieving good pain control. Many inadequate pain assessments seem impractical to implement in acute care practice settings. A standard assessment format is the critical aspect of pain assessment in that it can be done regularly such as once a shift or every 2 hours.[10] The foundation for the pain management plan is a collaboratively completed one by the doctor or the nurse, the patient, and his or her family.

A good comprehensive history is key and should include current experience of pain and its effect on the patient, previously used methods to control pain that the patient has found helpful, the patient's attitude toward and use of opioids, anxiolytics, or other medications, and any history of substance abuse. Others are the patient's typical coping response to stress or pain, the presence or absence of psychiatric disorders such as depression, anxiety, or psychosis, family expectations, and beliefs, the patient's knowledge, expectations, and preferences

for pain management methods and receiving information about pain management[1]

Cassell[25] reported that relief of suffering is one of medicine's primary aims and that physicians sometimes misunderstand what to do to alleviate suffering. The author showed that a well-trained physician might inadvertently cause suffering while treating a disease.[25]

According to Bateman[26], there was little or no formal education devoted to pain education in healthcare training programs in developing countries at the time of his report (2015). He reported a study finding that demonstrated that pain education in developing countries proved 'very, very poor at the undergraduate level', especially in South America, Africa, and the Indian subcontinent. He described that patients were suffering in silence globally. Further reports indicated that veterinary undergraduates spent twenty (20) times more attention on pain management in North America (Canada and the USA) than in developing countries. The finding suggests that animals suffering from pain were better cared for than human beings suffering from pain.[26]

A systematic review[27] of literature describing physician barriers to cancer pain management reported that knowledge of the principles of pain management varied from as little as 25% to 100% of physicians knowing the WHO recommendations for cancer pain management. Many of the studies reported inadequate knowledge of pain.

It has become more important now than ever to acquire specialized knowledge and skills in treating pain conditions anytime, especially in the advanced and terminal disease stages. Pain management as a medical skill must be intentionally acquired (taught and learned) because good pain control has become increasingly pivotal in improving the quality of care in palliative care. Suffice it to say, that pain management is a recognized subspecialty in many high-income countries and the trend is growing in most countries including South Africa.[26,28]

Through the Pain Association of South Africa (PainSA), a local branch of the

IASP study[26], an exploration of the knowledge of pain management in undergraduates in developing countries including South Africa was conducted.[26] The findings of the study led to a better understanding of the subject regarding time spent on pain management training in all medical schools in South Africa and, therefore, the possible clinical implications in the palliative care setting. PainSA has since instituted regular pain management training workshops conducted annually in each province to improve clinicians' knowledge of this important responsibility.

Bateman described the inadequate time spent on undergraduates' pain management training in South African medical schools[26]. The study compared the South African undergraduate medical students to that of veterinary medicine undergraduate students and found that the latter spent more time on pain management. In addition, the author also demonstrated that Western Europeans and North Americans consume most of the morphine in the world yet they lack knowledge to manage patients with severe cancer pain.

1.6. Consequences of poor pain management

In general, the patient's welfare and possible extended length of stay or readmissions in the hospital may affect negatively the cost of care as a direct result of inadequate pain management from limited knowledge by staff. The psychological state of the individual patient and their family members is affected by continuous, unrelieved pain which leads to commonly observed psychological responses to pain such as anxiety and depression.[29] With time, the victim may feel helpless and hopeless which may predispose them to more depression

The situation may get complicated when the patient who experiences continuous uncontrolled pain also suffers from co-morbid conditions and refuses to seek help.[8,9,10]

Brennan[7] reported that poor medical practice is the main cause of adverse effects from physiological and psychological under-treatment of pain. He elaborated that there are increases in heart rate, systemic vascular resistance, and circulating catecholamines, placing patients at risk of myocardial ischemia, stroke, and bleeding, if pain is not controlled adequately after surgery. Further, chronic pain syndromes evolve from unrelieved acute pains which commonly

elicit pathophysiologic neural alterations, including peripheral and central neuronal sensitization. There is a constellation of maladaptive physical, psychological, family, and social consequences linked to chronic pain syndromes as a disease entity.[7,8] The findings by Brennan were also supported by the FDA report that emphasizes avoiding brisk or sudden discontinuation of opioids as this might result in uncontrolled pain or withdrawal symptoms.[28]

Chronic pain has profound psychological ramifications including reduced mobility, loss of strength, disturbed sleep, immune impairment, increased susceptibility to disease, dependence on medication, depression, anxiety and so forth. In the individual, chronic pain incurs massive social and economic costs in addition to physical and psychological burdens. This can range from difficulty working, reduced participation in the labour force and disability which is described as “presenteeism” in chronic pain, that is, the substandard productivity of chronic pain sufferers who come to work rather than staying at home.[7,8]

The costs of worker compensation and disability payments due to loss of wages, and non-productivity in the home are huge.[30] However, the overall quality of life, including maintenance of function and interaction with family and friends is achieved through the effective treatment of chronic pain. The above form the foundation of palliative care which accepts such principles and extends it to the treatment of all symptoms.

Wee et al.[2] reinforce the above when they report that failure to treat the whole person results in inadequate pain control which may lead to several problems for the patient due to physical, psychological, social, emotional, and cultural connotations. Fatigue, anxiety, boredom, and anger all contribute to the patient’s lower threshold of pain. Even minor disturbances may lead to immense proportions of pain. The patient may perceive the healthcare worker to be inhuman, fear pain of any form and would probably never trust the medical fraternity again.

Further, the authors elaborate that adverse physical and psychological outcomes resulting from poor pain management in individual patients and their families are diverse[2]. Also, when a patient is suffering from continuously persistent pain, one is predisposed to reduced mobility which, in turn, could result in complications

like pneumonia, deep vein thrombosis and pulmonary embolus. This is particularly true in hospitalized or institutionalized individuals who may be in the post-operative phase or undergoing palliative care.

Paice describes a landmark study by Marks and Sachar in 1973 as the first to demonstrate the effects of the undertreatment of pain.[10] It was reported that seventy-three per cent (73%) of hospitalized medical patients had moderate to severe pain, according to the researchers. Even today, pain is being undertreated and the problem continues. According to the same report, forty-five per cent (45%) to eighty per cent (80%) of the elderly patients in nursing homes had pain that was undertreated.[12] Therefore, if not treated by palliative care or pain clinic specialists, it was concluded that there was only about a fifty per cent (50%) chance of obtaining adequate pain relief in patients suffering from moderate to severe pain.[13] There are several ways in which patients suffer from pain, including depriving them of their quality of life because they become depressed, and anxious and develop suicidal thoughts. Further, they may struggle to perform activities that they once did with ease but must endure pains to do the same tasks this time. The situation may pose psychosocial ramifications such as loss of relationships and failure to keep employment. Physically, pain has harmful effects on the body. It is physiologically unsafe to have pain as the effects of pain on the body are obvious.

The general understanding is that pain in any form may cause discomfort to the human being. Increased carbohydrate, protein, and fat metabolism are a result of the released excessive hormones by endocrine reaction. The patient's recovery is prolonged due to the stress response caused by unrelieved pain.[10]

To reduce the adverse effects on the cardiovascular system and prevent thrombus and embolus formation, an aggressive pain relief intervention is strongly recommended.[10] The other systems involved in unrelieved pain are temporary impairment of gastrointestinal function and increased risk of small bowel malfunction because the stress response causes increased sympathetic tone, intestinal secretions, smooth muscle sphincter tone, and gastric emptying. The result is that intestinal motility decreases, and bowel function becomes lazy.[10]

People living with metastatic cancer, especially, are harmed by unrelieved

constant or repeated pain. Known immune functions such as the natural killer (NK) cells that play a role in tumour growth prevention and control metastasis may be suppressed by stress and pain.[10] At a later stage, unrelieved acute pain can progress to chronic pain. Hence, a patient who is suffering from current pain may cause later pain which may be disabling and debilitating to the sufferer. Healthcare professionals ought to be aware and knowledgeable about handling acute pain to prevent the phenomenon of unrelieved pain from developing.

Cassell[16] argued that to minimize the effect of poor pain management from happening in practice, several interventions used include explanation, reassurance, identifying the primary cause and treating it, choosing the best route of drug administration, and promoting the patient's well-being. Without applying the combination of the above, the effect on the patient will be untreated pain and unnecessary suffering. Also, the author states that good pain control using morphine sulphate and other opioids is of vital importance in a dying patient with moderate to severe pain. This scenario is particularly challenging in the South African setting with reasonably accessible treatment regimens[31] but where a variety of governmental and internationally funded initiatives may not be possible. Lastly, pain control care is provided in a variety of settings in terms of location, size, demographics of patients cared for and the quality of care provided.[9,32]

CHAPTER 2: LITERATURE REVIEW

2.1. Introduction

This chapter describes the reviewed literature regarding doctors' use of morphine in pain management. The researcher used PubMed and Google Scholar search engines, with terms such as “morphine usage, “Doctors' attitude toward morphine prescription,” and “pain management.” The searches yielded several studies conducted in developed and developing countries on the prevalence and barriers to morphine therapy.

2.2. Prevalence of pain

Pain is common in cancer patients, particularly in the advanced stage of disease where the prevalence is estimated to be high.[33]

In early reports on the prevalence of pain, Ferreira et al[34] revealed four decades ago that epidemiology figures ranged from fifty-two per cent (52%) to seventy-seven per cent (77%). More recent studies as early as 2004 by Pingnon et al. showed the prevalence of pain ranging from twenty-four per cent (24%) to sixty per cent (60%) in patients on active anti-cancer treatment and Bradley et al.[35] reported sixty-two per cent (62%) to eight-six (86%) in those with advanced cancer. However, before that finding, Bonica[36] had extrapolated the prevalence of pain in many studies globally and found the mean pain prevalence of fifty per cent (50%) in patients with various stages of cancer and seventy-one per cent (71%) in those with advanced cancer.

A systematic review which was conducted in 2005 and included Bonica’s review[36] reported a combined weighted mean prevalence of pain to be forty per cent (40%) and seventy-four per cent (74%) in patients with all cancer stages versus those with a terminal disease, respectively.[25] The study also found that more than a third of patients graded their pain as moderate or severe.[25] The authors suggested that the differences across the studies could have been due to population characteristics and the mode of data collection of the research process.[25,36]

In the same vein, Nickel and Raspe[37] “conducted a qualitative systematic review on the epidemiology and use of services in treating chronic pain that included

seventeen (17) epidemiological studies". The prevalence estimates for chronic pain ranged from seven per cent (7%) to fifty-five per cent (55%). The authors extracted demographic variables information from individual studies and noted that the frequency of chronic pain appeared to increase with age and peaked between 45 and 65 years of age.[34] Perhaps, the authors could have developed better criteria to mitigate the heterogeneity in population characteristics and other variables.

An additional systematic review conducted by Ospina and Harstall[38] on 13 studies found prevalence estimates of chronic pain ranging from 11.5% to 55.2%. Studies were examined according to the characteristics of the population, sample size, response rate, and the definition of chronic pain in the hope of characterizing prevalence estimates according to study requirements.

The studies strongly suggested that the prevalence of chronic pain had a cultural component. Nevertheless, the culture of pain differs in different continents because the norms often conflict with one another. The researcher's analysis of the above studies is that the main strength of the studies was the international appeal which cut through four (4) continents with different cultures. However, it was a huge challenge to maintain consistency in the research methodologies employed and the data collected because the researchers and assistants involved in different continents may vary in their knowledge, skills, and grasp of research concepts, despite the research tools used being similar.

The study conducted by Ospina and Harstall[38] pointed to a wide variation in the reported prevalence of pain over time to indicate the subjective nature of pain, different research methodologies applied, and the complexity of measuring pain variables in different study populations and cultures as possible limitations of the study. To minimize variations or mitigate the above, there must be meticulous standardization in executing the above research processes.

Lastly, potential researchers ought to realize that as cancer survivors increase, the importance of reducing the prevalence of pain at all stages of the disease process becomes paramount, if we are to provide quality comprehensive palliative care to all patients suffering from moderate to severe pains in any given setting. Equally, the need to conduct more accurate pain prevalence studies across large study populations and cultures will become more important.

2.3. Use of morphine as analgesic

Morphine has been used for many years to relieve pain. In 1805, Friedrich Serturner isolated Morphine from opium. Once the hypodermic needle was developed 50 years later, morphine usage became widespread. It was used for different reasons ranging from pain relief for war injuries and chronic painful diseases to recreational use among drug abusers.[39]

In 1996, the World Health Organization (WHO) published a guide to Cancer Pain Relief advising a 3-step ladder for pain control with opioids, specifically morphine for the management of severe pain.[4] This document has formed the foundation for effective pain management since its publication. In 2012, The Lancet published recommendations from the European Association of Palliative Care on the use of opioids in cancer pain.[32] These recommendations were evaluated using the Grading of Recommendations, Assessment, Development, and Evaluation (GRADE) system. EAPC comments on the lack of evidence for the use of morphine and the challenge of undertaking randomised controlled trials (RCTs) in patients with cancer pain. However, from the evidence that does exist, EAPC identifies morphine as the drug of choice for treating moderate to severe pain, and comments on other opioids available for pain relief with recommendations for the use of morphine, oxycodone, and hydromorphone which have been shown to have similar efficacy. Thus, there is a "weak recommendation that any one of these three drugs can be used as the first choice step III opioid for moderate to severe cancer pain." There is also a weak recommendation for the use of transdermal opioids (fentanyl or buprenorphine) in patients with swallowing difficulties. The recommendations cover several topics such as route of administration, management of both nociceptive and neuropathic pain, management of opioid side effects, and pain management in renal failure.[32]

In South Africa, the Pain Society PainSA published its Guide to the Treatment of Cancer Pain in 2015[33]. This is a comprehensive document detailing, the causes of cancer pain, pain assessment, considers the role of 'total" pain, and the importance of a multidisciplinary approach to pain management. Morphine is

recommended as the drug of choice for the management of severe pain.

A study done by Flemming[40] in 2010 showed that anxieties were common among patients, healthcare professionals, and carers, despite research demonstrating morphine's effectiveness as an analgesic.

Analgesic treatment should start with drugs indicated by the WHO analgesic ladder appropriate for the severity of pain.[41]

The data permit a strong recommendation to routinely prescribe laxatives for the management or prophylaxis of opioid-induced constipation.[42]

Oxycodone, hydromorphone, and fentanyl are all also considered and the recommendation for the use of morphine is because of its affordability and availability in South Africa. The document draws on several sources to inform the guidance including the EAPC recommendations described above. This brief discussion indicates that there are reputable documents to guide the management of cancer pain internationally and locally in South Africa.

2.4. The opioid crises

According to Wee et al.[2], the access, misuse, and diversion of opioids are two of the major issues globally regarding opioids. Most of the world's population lives in countries where access to opioids for medical purposes is non-existent or negligible. That is the reason why international organisations like the WHO have repeatedly appealed to countries to make import laws suitable to make the availability of opioids easier to the populations who may need them for moderate to severe pain treatment and quality of life.[43]

In their public policy review of 2019, Wee et al.[2] reported the current opioid problems in the USA. They described the reasons behind the problems including weaknesses in the law and the increasing demand from recreational users. Further, they revealed the undesired effects the opioid problem was having on the medical profession there. The authors noted that opioid diversion has been a global phenomenon for over 30 years which has led to increasing adverse conditions like addiction, criminal behaviour, conflicts, and overdose deaths.

Also, Wee et al.[2] cited deaths of more than 70,000 people in the USA alone from drug overdoses in 2017 which was reported by the CDC. There was a 9.6% increase from the previous year's reported death figures from the same condition. Despite the implementation efforts of policies, deaths became uncontrollable and continued to soar. The reason behind the deaths was attributed to several factors including opioids easy accessibility and misuse of opioids as street drugs, illegal production and supply of opioids, and a general increase in opioid addiction. The misuse of opioids involved prescription pain relievers, heroin, and synthetic opioids such as fentanyl. Worse, healthcare professionals contributed to opioid availability and misuse by prescribing excessive over-the-counter prescription of opioids. Hence, the opioid crisis in the USA was created and affects public health as well as social and economic welfare.[2] However, proper monitoring and health care professionals' compliance with the regulations for the use of opioids in patients suffering from chronic cancer and non-cancer patients could have avoided the crisis. Also, a balance should be between patients who benefit from the use of opioids in cancer and non-cancer moderate to severe pain, and the control of drug abusers should be managed well because deserving patients should not be disadvantaged.

Improved access to medication-assisted treatment or reducing the supply of opioids by increased monitoring and regulation of opioid prescribing could go a long way in solving the problem. Both the composition of the society at risk of opioid addiction and the immediate mortality rates due to opioid overdose ought to be managed appropriately and urgently by the combinations of interventions so that the effect of those measures is evident on different fronts in each context.[2]

The second crisis involves patients experiencing chronic pain in whom pain was previously controlled but now having difficulties in accessing pain medications due to strict regulatory controls. Uncontrolled pain, serious withdrawal symptoms, and even suicide have resulted from inappropriate discontinuation of opioids in patients who were physically dependent on them. When patients were inappropriately discontinued from opioids, they ended up having a confusing scenario of drug abuse-seeking behaviour attempting to find other sources of opioid analgesics. Also, by using other illicit opioids, such as heroin, patients

could attempt to treat their pain or withdrawal symptoms which cause more mortalities.

It is recommended that the patient and the healthcare provider's goals and expectations be clear and realistic at the inception of treatment. The need for ongoing opioid use needs to be recognized especially in patients with cancer pain. Adequate pain control is part of appropriate, compassionate care. Patients with progressive malignancy may require escalating doses of opioids to control pain. Patients no longer requiring opioids or responding to other treatment modalities should agree with their physician on an appropriate tapering schedule and follow-up plan to ensure ongoing care of the patient. The opioid analgesic dose, duration of treatment, the type of pain, and the physical and psychological attributes of the patient are some of the factors to consider when deciding to discontinue or decrease therapy in an opioid-dependent patient. However, there is no one-size-fits-all standard opioid tapering schedule suitable for all patients. To avoid serious withdrawal symptoms, worsening of the patient's pain, or psychological distress, there must be "a patient-specific plan to gradually taper the dose of the opioid and ensure ongoing monitoring and support."[11,12,27]

2.5. Barriers to morphine use by doctors

The above publications[2,3,5,9,26] have reported that there are several barriers to morphine use in most parts of the world. So, what difficulties do most of the world have in accessing essential medicines like morphine for palliative care? The human rights guide mentions the main factors that affect the availability of opioids for medical needs around the world.

The guide includes addressing doctors' concerns about training insufficiency for health care workers, addiction and the reluctance to prescribe controlled substances, stringent or restrictive laws and regulations, administrative overload, high cost of medications, poor distribution of drugs, insufficient supply, and absence of clear guidelines and policy from health authorities and stakeholders. According to the International Narcotics Control Board (INCB)[44] patients addicted to or dependent on opioids are the source of healthcare worker worry, hence opioid is under-prescribed for palliative care purposes. However, opioid prescription for pain relief does not lead to dependence as demonstrated in

surveys.[44] Also, the use of controlled drugs is surrounded by many myths that lead to addiction, not treating pain adequately, or that chronic or terminal pain cannot be treated. Therefore, the said factors should not be reasons for denying medications for medical use.[34] Insufficient training for health care professionals may contribute to under-prescribing. They sometimes are hesitant to prescribe or stock opioids for legal fear implications, misunderstanding of the efficacy of opioid medication, or fear of addiction, if there is no proper training.[44]

Paice[10] states that barriers to morphine use for better pain control by doctors may include the exaggerated fear of induced or iatrogenic addiction, an attitude among healthcare professionals that seems to indicate that patients may exaggerate the intensity of their pain. The author further elaborates that there is a poor correlation between pain behaviour and pain intensity that may mislead healthcare professionals who rely on pain behaviour to assess pain intensity and a lack of agreement between the attending doctor and nurse in estimating the intensity of a patient's pain[10]. Hence, healthcare workers should attempt to ameliorate the present pain in a manner consistent with the desire of the patient and the acceptability of adverse effects. The report concludes by reinforcing that the doctor, nurse, patient, and family should be educated on issues of morphine safety and effectiveness.[10]

2.5.1. Attitude and knowledge-related barriers

As stated above, the International Narcotics Control Board (INCB)[44] surveyed countries to determine the main factors that influence opioid availability for medical needs, namely: "concerns about addiction, reluctance to prescribe or stock-controlled substances, insufficient health professionals training, law restricting activities, administrative burden, opioids cost, difficulties in distribution, insufficient supply, and absence of relevant policy". The top three (3) factors in the above list are related to knowledge and attitudinal barriers affecting the availability of opioids for medical purposes.[38,44]

A Swiss study conducted by Ung et al.[45] demonstrated misconceptions and practical challenges among healthcare workers. This was important because it highlighted the fact that healthcare worker misconceptions and barriers to analgesic usage were not limited to developing countries. Components of pain

include physical, emotional, social, and spiritual aspects. For pain to be managed better, a holistic multidisciplinary approach is needed where the physician will go beyond the patients' main complaint to assess the cause of pain and find a comprehensive solution including appropriate prescribing and non-pharmacological measures. Regarding palliative care, Kheshi et al.[46] state that pain is one of the most worrisome concerns in dying patients with any form of pain. Hence, pain must be always managed appropriately as the basis of fundamental patient care. It is for that reason that pain management becomes the cornerstone in the palliative care of dying individuals in any setting.

Ung et al.[45] assessed knowledge, perceptions, and attitudes to pain management among medical and nursing students and found that despite the diversity of standardised instruments used, the knowledge about pain management among nursing and medical students was generally poor among both groups. The weakness of the study was that Ung[45] and the team enrolled medical and nursing students as study participants. That cadre of health workers were not qualified yet as health professionals and it would be expected that their knowledge could not be benchmarked.

Therefore, one may argue that a different result could have been obtained had Ung et al. used doctors and nurses who were already qualified and practised as clinicians.[45] Further, nursing and medical students differed fundamentally in basic scientific and clinical knowledge of pain conditions because their training syllabuses were different. To mitigate the above bias, the authors could have enrolled the participation of practising clinicians and, perhaps, compared them to nursing staff if they so wished. Similarly, Kheshi et al. studied knowledge, attitude, and practice of chronic pain management among healthcare workers[46]. The authors reported similar findings about inadequate knowledge, attitudes, and practices regarding chronic pain management. The key recommendation from the study was that the acquisition of pain management skills was needed through education and practical training of healthcare workers to improve their practice behaviours. The above findings speak to the fact that pain management was a skill to be acquired and the knowledge obtained by medical and nursing students during their training was not adequate in the pain management practice. The two studies above recruited different groups of study participants although the findings were similar[45,46]. The former enrolled nursing and medical students

while the latter studied knowledge, attitude, and practice about chronic pain management among health care workers. The two groups were not homogenous because the term health care worker was broader than medical and nursing students and could include pharmacists, social workers, allied professionals, administrative clerks and so forth. Perhaps, the standardization of measuring instruments used in many similar studies could have largely minimized this study's limitation.

2.5.2. Barriers due to restrictive laws and regulations

The International Narcotics Control Board (INCB)[44] shows that “laws in the country can be so burdensome that they impede the distribution of controlled substances or prohibit their use altogether”. For access to essential medications to be effective, all levels of laws and regulations of opioid analgesics and other controlled drugs must favour the sufferers of moderate to severe pain.

The said report further states that laws that prohibit or restrict the appropriate medical availability and use of opioids might result in some health professionals choosing to prescribe mild opioids and other analgesics, instead of the appropriately indicated medications[44]. The reason for the inappropriate choice of the said drugs could be because of regulations which might make prescribing morphine or strong analgesics for medicinal use too cumbersome. As a result of the situation, patients might not have received proper pain relief not because the medication was not there, but because the prescriber was too afraid and lacked knowledge in pain management.[25] In contrast, the South African legislation about opioid use in patients is fair or non-restrictive, generally. Morphine is available for acute pain even at primary healthcare-level facilities, although it is initiated by a doctor because it is a scheduled drug for the sake of good control[20].

2.5.3. The opioid cost barrier

According to INCB[44] advocacy for the solution to pain and suffering low-cost palliative care and access to opioids should be the norm. However, even if manufactured at low cost, its affordability for all individuals suffering from chronic illnesses might not be guaranteed because of commercial reasons and the desire to recoup research, drug development and marketing costs. A good example is when multinational pharmaceutical companies generally incur large overhead

costs to import opioids and then pass the extra cost on to consumers. Opioid analgesics may not be expensive to produce, and the necessary morphine powder could be obtained from international producers at very low costs.[44]

In South Africa, morphine is cheap and readily available in all health-level settings as a scheduled drug. It is available to manage moderate to severe pain in cancer patients and others. However, its availability is sometimes limited because of the laws and requirements to stock the drug. There are some similarities reported on the African continent where barriers to accessing morphine usage included limited medical knowledge, regulations, lack of enabling policies and drug supply challenges. From experience, the remote areas of South Africa are often the heaviest affected due to logistical challenges in transport, infrastructure, and staff shortage which make the availability of the drug non-existent.

Further, the Essential Medicines List (EML)[47] in South Africa includes morphine for use in clinics and hospitals which means that its use is widely recommended by the Department of Health. It is prudent to believe that morphine in South Africa should be made available in all healthcare facilities in the country because it is cheap and readily procured. However, being a scheduled drug morphine usage is correctly subjected to documentation and physical count as a measure of good drug management and control. For the preceding reason, it needs a doctor to initiate treatment with morphine and to re-order its stock. Control books are audited weekly by the pharmacist. The drug might be more difficult to stock in remote areas where no pharmacist exists but nurses can order it if a doctor has signed to request for the stock. The above could make morphine access challenging at times unless healthcare workers are trained on its use for pain control in acute, moderate to severe pains in both cancer and non-cancer patients requiring it.

Gwyther revealed some rationalisation for the use of morphine in South Africa and quoted: “When we ask why the clinic is not stocking morphine, the pharmacist will say the doctor is not prescribing it. And when we ask the doctor why he is not prescribing it, he will say it is because it is not kept in the clinic”[47]. There were blame games in most health institutions because doctors were not prepared to take responsibility for failure to adequately manage pain to relieve suffering in their patients. Worse still, the pharmacists could not advocate for the patient’s

pain relief and control, either. Pain management is a multidisciplinary approach and all health workers are needed to take clear roles in minimizing patients' suffering from pain.

2.6. Summary of literature review

The reviewed literature revealed consistency in important barriers to morphine therapy across multiple settings and countries. Furthermore, it was evident that opioids were the mainstay in the treatment of moderate to severe acute and chronic pain for many decades. Morphine sulphate treatment should be prescribed appropriately by skilled medical practitioners, especially for dying patients with moderate to severe pain.

As demonstrated above in the International Narcotics Control Board (INCB) report[44] it is apparent that lack of knowledge and attitudinal barriers or the mindset of stakeholders in the opioids delivery system were the main leading reasons for the under-prescribing of opioids by medical practitioners or doctors. Hence, the availability of opioids in health institutions for medical purposes could be a huge challenge. Therefore, a research agenda was needed to explore the doctors' practices, perceptions and factors affecting morphine usage in a South African peri-urban setting, particularly Pholosong Regional Hospital.

2.7. Research question

What are the doctors' perceptions and factors affecting morphine usage in Pholosong Regional Hospital, in Ekurhuleni Health District?

2.8. Aim and objectives

2.8.1. Aim

The aim was to explore doctors' perceptions of morphine usage for pain management in Pholosong Regional Hospital in Ekurhuleni, Gauteng Province, South Africa.

2.8.2. Objectives

- To identify the doctors' perceptions of morphine, and its use in pain management among their patients

- To identify factors associated with the usage of morphine in Pholosong Regional Hospital

CHAPTER 3: RESEARCH METHODOLOGY

3.1. Study design

The study, conducted from January 2015 to February 2015, was a descriptive cross-sectional study using a survey with closed and open-ended questions to collect data related to the study.

3.2. Study site

The research study was conducted in Pholosong Regional Hospital, a public hospital located in Tsakane, Mashona Township in Ekurhuleni, Gauteng, South Africa. The hospital serves a predominantly African population and was established in the early 1960s following Apartheid segregation rules, designed, and funded as such. Statistics SA reported in the 2011 Census that Tsakane had a population of 135, 994 (6,884.17 per Km^2) - www.statssa.gov.za website. The hospital previously served disadvantaged citizens and had a bed capacity of 570 but not all beds were utilized due to budget constraints. It was reasonably equipped and supported by the Gauteng Department of Health to offer regional or secondary-level hospital services to patients from the surrounding 15 primary healthcare clinics. It had several inpatient wards and outpatient clinics for all clinical disciplines, an HIV/AIDS clinic, a well-refurbished TB (TB, MDR- TB) unit and a step-down (or an implied palliative care) ward. The hospital was staffed with professional health workers including ninety (90) medical doctors of all categories (interns, community service doctors, sessions or part-time doctors and full-time and medical officers).

3.3. Study population

The study population was the doctors working in Pholosong Regional Hospital.

3.4. Sampling

3.4.1. Sample size

The sample size calculation used the Raosoft software. That was done in consultation with the statistician. In Pholosong Regional Hospital, the total number of doctors was ninety (90). Over the one-month study period, it was

expected that there would be ninety (90) doctors available at most. With a 5.0 % margin of error, a p-value of 0.05, and a frequency of barrier factors of 50%, with a 95% confidence interval (CI), the minimum sample size required was seventy-four (74 doctors).

The sample size was calculated using the Raosoft website on www.raosoft.com whereby the sample size 'n' and margin of error 'E' are given by:

$x = Z\,(c/100)^2 r(100-r)$

$n = N\,x\,/\,((N-1)\,E^2 + x)$

$E = Sqrt\,[\,^{(N-n)\,x}\,/n(N-1)]$

Where **N** = the population size, ***'r'*** is the fraction of responses that one is interested in, and ***Z(c/100)*** is the critical value for the confidence interval ***'c'***

3.4.2. Recruitment method

Medical practitioners were informed about the research project at a Friday morning doctors' meeting and were invited to take part in the study. The information-sharing sessions were supposed to be attended by all doctors and allied professionals. The Friday meetings were continuous professional development (CPD) meetings which were open to all doctors and allied professionals from different clinical disciplines in the hospital. At those meetings, an opportunity arose for the researcher to present the study aims, objectives, methodology including the questionnaire, and ethical considerations in the form of consent and anonymity processes. These were all explained to the attending health workers including medical practitioners. All doctors were invited to participate voluntarily in the study.

3.1. Measuring tool or instrument

A pre-coded, standardized study questionnaire for this quantitative research was developed using combined questions from previously validated questionnaires which had been administered in similar settings. The study questionnaire was piloted by using colleagues in a postgraduate class so that time to complete the

questionnaire and issues of applicability could be assessed with certainty.

Doctors were expected to have a high level of competency in the English language. The tool utilized contained two sections, namely A & B, where the former was socio-demographics and the latter section contained morphine usage practice. The socio-demographic variables included age (in years), gender, marital status, level of education, employment status, and the clinical department where the medical practitioner worked.

In section B, participating practitioners were asked about perceptions of morphine use as an analgesic. The morphine usage questions ranged from comfort when prescribing it, safety, effects, availability, legality, frequency, doses, pain management experience, knowledge of its use and the medical practitioners' need for training in pain management. Lastly, they were asked if they knew of any other problems that the researcher did not mention regarding morphine prescription.

3.2. Data collection procedure

Participating practitioners who were directly involved in managing patients were required to complete the self-administered questionnaire in their own time, without an interviewer being present. Data collection was conducted over a month, and participants were selected opportunistically and were given a questionnaire to answer. However, the questionnaire was collected after it had been completed as soon as possible or within a week at most A follow-up by the researcher was necessary for those participating practitioners until the pre-determined sample size was reached.

3.7. Data capture and methods of analysis

3.7.1. Data capture

The collected data were entered into an Excel sheet which was prepared by the principal investigator. After some cleaning, they were transferred into an SPSS Software (Statistical Package for Social Science) on version 23.1 for Windows (IBM/SPSS Inc., New York, USA**)** environment by the principal investigator.

3.7.2. Methods of data analysis

Those data were quantitative and Morphine usage items were assessed using item analysis. Deriving a composite, the reliability was assessed using the Kuder-Richardson coefficient by the principal investigator who was assisted by the statistician. Categorical variables/data were summarised using frequencies and percentages. Continuous variables/data were summarised using the median and interquartile range. To achieve the objectives of the study, the Chi-Square test of independence was used to determine whether demographic and professional characteristics factors with morphine usage were associated with each other; descriptive statistics and frequency distributions were used for different socio-demographic variables. These were presented in the form of figures and graphs, where necessary. The odds ratio (OR) and Confidence Interval (CI) of 95% were obtained to state significant associations. The independent variable identified was non-adherence to WHO pain management guidelines. The investigator determined the percentage of doctors surveyed and met the criteria for morphine usage. The criteria for 2-sided statistical significance were defined by a P-value <0.05.

3.7.3. Ethical considerations

The study protocol was submitted first to the University of Cape Town (UCT) Human Research Ethics Committee for the approval and issuing of the ethics clearance certificate before the research study could commence, (HREC Ref# 837/2014). Further, the researcher obtained permission from the Ekurhuleni Health District Research Ethics Committee before the Pholosong Regional Hospital Chief Executive Officer (CEO) also granted permission for the study to take place in the hospital.

Doctors were invited to take part in the research study. To find out what problems practitioners may have had in prescribing morphine sulphate; they were requested to answer a set of twelve (12) questions using a questionnaire. Participation in the study took about ten (10) minutes of their time. The study did not present any risks to participants but asked for their time to complete the

questionnaire. However, there was a possibility of a better understanding of pain management among doctors in the hospital. There was no payment or cost associated with participation. Completing the questionnaire might have made them feel uncomfortable and time-consuming. It was stated that the study would help the hospital to identify areas in which doctors had problems in prescribing morphine sulphate, thereby, assisting in the improvement of the care provided to patients who were admitted or visited the hospital.

There was no direct benefit to the participating practitioners in the study, and there was no financial gain. The study was voluntary. If the respondent refused to participate or withdrew from the study there would be no penalties. They were free to refuse or withdraw from the study at any time, without explanation. If they decided to retain data collected from them, they would instruct us to destroy it, once they withdrew from the study.

Data storage and confidentiality of all the information given by the respondents were kept strictly confidential. The consent form that was signed was securely stored and access was limited to the researcher and his assistants only. The results of the study were presented confidentially and no information which could enable anyone to identify respondents personally was reported.

All the data given remained confidential and could only be seen by the Principal Investigator, Research Assistants, and Supervisor. There was no name linked to the data captured so it could never be traced back to the doctors who participated. All data collected was securely retained. It was a confidential questionnaire, and the results would remain anonymous. Confidentiality in terms of anonymity for respondents and safekeeping of records were guaranteed.

CHAPTER 4: RESEARCH RESULTS

4.1. Introduction

This chapter presents the study's findings using data analysis based on the SPSS Software. The findings include socio-demographic characteristics and the morphine usage perception by the Pholosong Regional Hospital doctors. Seventy-four (74) questionnaires were distributed and a 100% response rate was obtained. The target study population was seventy-four (74) but two (2) questionnaires were less than fifty per cent (50%) completed and the information obtained was not useful, so we considered only those 72 questionnaires in the analysis.

4.2. Socio-demographic analysis

This section included the respondents' age in complete years, gender, educational level, marital status, employment status, and the clinical department in which the medical practitioner or doctor worked.

Comments for Table 1 below:

- The table reports three (3) age categorizations: the younger or first group (less than 35 years old), the middle or second group (35-44 years old), and the older or third group (45 years and more), with an age median of 45.5.
- There was thirty-six per cent (36%) or n=26 of female respondents in the study compared to sixty-four per cent (64%) or n=46 males to produce a ratio of nearly one to two of female to male medical practitioners.
- There was eighty-nine per cent (89%) or n=64 of black respondents in the study compared to eleven (11%) or n=8 whites to produce a ratio of one to eight of white to black medical practitioners.
- There was thirty-three per cent (33%) or n=24 of single respondents in the study compared to sixty-seven per cent (67%) or n=48 married to produce a ratio of one to two of single to married medical practitioners.
- There was sixty-seven per cent (67%) or n=48 Medical officers' respondents in the study compared to twenty-two per cent (22%) or n=16 Interns, height per

cent (8%) or n=6 specialists and three per cent (3%) or n=2 Community Service Officers.

- There were ninety-four per cent (94%) or n=68 full-time employed doctors in the study compared to six per cent (6%) or n=4 sessional doctors.
- Respondents from the different departments are also described in Table 1.

Table1. Socio-demographic analysis

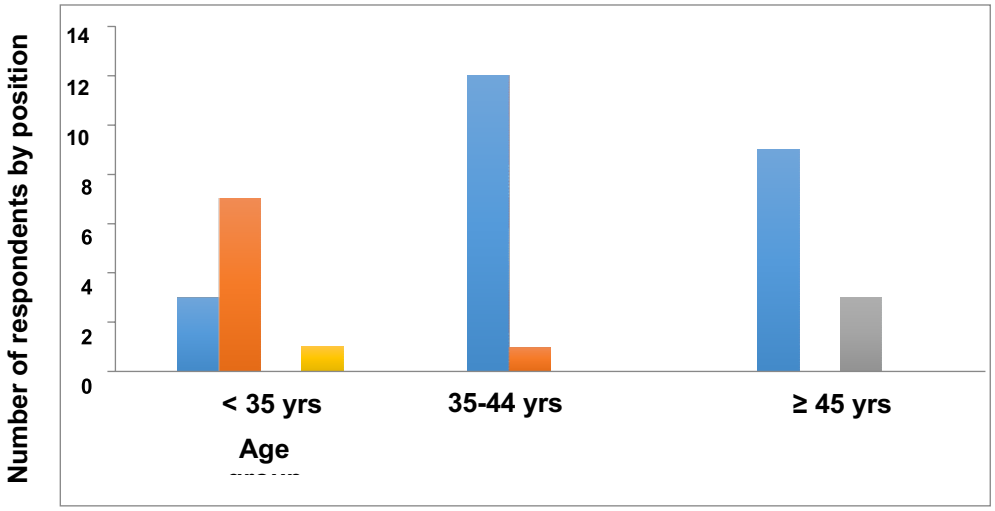
Age categories	
less than 35 years n (%)	22 (30.56)
35-44 yrs	26 (36.11)
45 and older	24 (33.33)
Age median (iqr)	40.5 (13.5)
Gender	
Male	46 (63.89)
Female	26 (36.11)
Ethnic group	
Black	64 (88.89)
White	8 (11.11)
Marital Status	
Single	24 (33.33)
Married	48 (66.67)
Level of employment	
Intern	16 (22.22)
Community Service	2 (2.78)
Medical Officer	48 (66.67)
Specialist	6 (8.33)
Employment status	
Sessional	4 (5.56)
Full-time	68 (94.44)
Department	
Casualty	14 (19.44)
Family Medicine	4 (5.56)
Obst-Gynae	6 (8.33)
Anaesthetics	10 (13.89)
Surgery	10 (13.89)
Orthopedics	6 (8.33)
Internal Medicine	14 (19.44)
Management	2 (2.78)
Paediatrics	2 (2.78)
OPD	2 (2.78)
Ophtalmology	2 (2.78)

- Of note, white respondents were only eleven per cent (11%) or n=8 and formed part of the older age groups (45 years and above).

4.3. Respondents' positions and ages

Figure 1 illustrates respondents by the positions they occupied at the hospital compared to their age. Doctors who were less than 45 years old did not have specialist qualifications in Pholosong Regional Hospital.

Figure 1: Respondents by occupational positions held by doctors and age



4.4. Results of morphine usage survey

Table 2 illustrates the usage of morphine in the management of pain in Pholosong Regional Hospital.

Of all respondents:

- twenty-five per cent (25%) or n=18 were uncomfortable prescribing morphine
- forty-two per cent (42%) or n=30 thank that morphine was an unsafe analgesic
- twenty-eight per cent feared morphine side effects on their patients
- nineteen per cent (19%) or n=14 felt that the morphine availability in the hospital was a problem
- eleven per cent (11%) or n=8 felt that morphine legal regulations were a problem
- thirty-nine per cent (39%) or n=28 felt that morphine should be used regularly for pain management
- three per cent (3%) or n=2 felt that morphine dosage was a problem for not

prescribing

- fifty per cent (50%) or n=36 said that morphine was ready on request for pain management in their department
- fourteen per cent (14%) or n=10 experienced a lack of knowledge in prescribing morphine
- forty-seven per cent (47%) or n=34 said that they did not get any training in morphine usage
- Sixty-four per cent (64%) or n=46 said that the needed training in pain management

Table 2 describes the responses to the morphine usage questionnaire

Table 2. Morphine usage

	No n (%)	Yes n (%)	Total
(1). Do you feel uncomfortable prescribing morphine?	54 (75.0)	18 (25.0)	72
(2). Do you think that morphine is an unsafe analgesic?	42 (58.3)	30 (41.7)	72
(3). Do you fear morphine side effects to your patient?	52 (72.2)	20 (27. 8)	72
(4). Is the availability of morphine in the hospital a problem for you?	58 (80.6)	14 (19.4)	72
(5). Do you feel that the legal regulations to morphine prescription are the problem?	64 (88.9)	8 (11.1)	72
*(6). Do you feel that morphine should be used regularly for pain management?	44 (61.1)	28 (38.9)	72
(7). Is the morphine dosage the reason why you do not prescribe it?	70 (97.2)	2 (2.8)	72
*(8). Does your department have morphine ready on request for pain management?	36 (50.0)	36 (50.0)	72
(9). Do you experience a lack of knowledge in prescribing morphine?	62 (86.1)	10 (13.9)	72
*(10) Did you get any training in morphine usage?	38 (52.8)	34 (47.2)	72
(11). Do you need training in pain management?	26 (36.1)	46 (63.9)	72
* Items that should be flipped			

4.5. Reliability of survey items

The reliability of the morphine usage item set was assessed using the Kuder-Richardson coefficient – see Table 3.

- Questions 1, 2, 3, 4, 5, 7, 9, and 11 are worded such that agreement with the statement suggests non-compliance with the WHO criteria of morphine usage.
- Whereas, questions 6, 8, and 10 are worded in such a way that agreement with the statement suggests compliance with the WHO criteria of morphine.

- The three items, questions 6, 8, and 10, were reverse-coded to assess the internal consistency of the item set and the derivation of a composite score reflecting overall/general non-compliance.
- Questions 4, 6, 8, and 10 showed low item-rest correlation and the overall KR20 coefficient was below 0.7 with these questions included. With these four questions excluded the KR20 coefficient was 0.7002.
- Question 11 showed a low item-rest correlation relative to the rest of the items (0.1478). The KR20 coefficient on the six questions (questions 1, 2, 3, 5, 7, and 9) was 0.7459.
- These items were used to derive the composite score.

Table 3. Reliability of the morphine usage

Item	Obs	Item difficulty	Item variance	Correlation
Uncomfortable prescribing	72	0.2500	0.1875	0.5908
Morphine unsafe	72	0.4167	0.2431	0.5100
Fear morphine side effects	72	0.27278	0.2006	0.4155
Legal regulations problem	72	0.1111	0.0988	0.4264
Morphine dosage problem	72	0.0278	0.0270	0.4466
Lack of knowledge	72	0.1389	0.1196	0.5984
Test		0.2037		0.4979
KR20 coefficient	0.7459			

4.6. Comfort in prescribing morphine

The next section looks in depth at respondents' comfort in prescribing morphine as this item was assessed as reliable and prescribing of morphine is a foundational factor in assessing respondents' perceptions of morphine.

4.6.1. Comfort in prescribing morphine by gender

Comment:

- Of all respondents, forty-nine per cent (49%) or n=35 of male doctors and eleven per cent (11%) or n=8 of female doctors were uncomfortable prescribing morphine. (Table 4).

- There was a significant difference by gender in that male doctors were more likely to be uncomfortable prescribing morphine.

Table 4. Comfort in prescribing morphine by gender

	Gender		Odds ratio	p-value
	Male	Female		
Do you feel uncomfortable prescribing morphine?			1.5 (0.03 – 0.74)	<0.001
• Yes	16 (34.8)	2 (7.7)		
• No	30 (65.2)	24 (92.3)		

4.6.2. Comfort in prescribing morphine by Age group

Table 5 illustrates 3 different components assessed by the survey.

Comfort in prescribing morphine by age group:

- 44% (n= 32) of respondents who were above 45 years of age, 31% (n= 22) of those between 35-45 years, and 7% (n= 5) of those below 35 years of age were uncomfortable prescribing morphine.

Concern about morphine availability

- 56% (n= 40) of those above 45 years and 14% (n= 10) of those below 35 years felt that morphine availability in the hospital was a problem.

Understanding of legal regulations governing use of morphine:

- 22% (n= 16) of those above 45 years and 15% (n= 11) of those between 35-45 years felt the legal regulations on morphine prescription were a problem. (Table 5).
- The differences in prescribing and knowledge about morphine availability and legal regulations were significant between the age groups.

Table 5. Morphine usage parameters by age group

	Age group (years)			p-value
	<35	35-45	>45	
Do you feel uncomfortable prescribing morphine?				0.01
• Yes	2 (7.1)	8 (30.8)	8 (44.4)	
• No	29 (92.9)	18 (69.2)	10 (55.6)	
Is the availability of morphine in the hospital a problem for you?				<0.001
• Yes	4 (14.3)	0 (0)	10 (55.6)	
• No	24 (85.7)	26 (100)	8 (44.4)	
Do you feel that the legal regulations on morphine prescription are a problem?				0.04
• Yes	0 (0)	4 (15.4)	4 (22.2)	
• No	28 (100)	22 (84.6)	14 (77.8)	

4.7. Morphine usage items

- Morphine usage items that were found to be less reliable, survey questions were analysed separately. Table 6 illustrates the Chi-square test of independence for these items.
- Results from the chi-square test of independence showed associations with the level of employment in Q4, Q6, and Q11.
- Results showed no association between the morphine usage items and the department.

Table 6. Chi-square test of independence for Q4, 6, 8, with gender, age category, level of employment and department.

		Q4 - Availability		Q6-morphine use		Q8-morphine ready	
		No	Yes	No	Yes	No	Yes
Gender	Male	36 (78.3%)	10 (21.7%)	30 (65.2%)	16 (34.8%)	20 (43.5%)	26 (56.5%)
	Female	22 (84.62%)	4 (15.38%)	14 (53.85%)	12 (46.15%)	16 (61.54%)	10 (38.46%)
	Fisher's exact	p = 0.757		p = 0.451		p = 0.220	
	Cramer's	V = 0.0771		V = 0.112		V = 0.1735	
	OR	0.655		1.61		0.481	

- Table 7 describes the respondents' perception of the usage of morphine and the regularity of use of morphine.

Table 7. Regularity of using morphine by age

	Do you feel that morphine should not be used regularly for pain management?		
Age group	No	Yes	Total
≤ 34 yrs	18 13.4 81.82 40.91	4 8.6 18.18 14.29	22 22.0 100.00 30.56
35-44 yrs	14 15.9 53.85 31.82	12 10.1 46.15 42.86	26 26.0 100.00 36.11
≥ 45 yrs	12 14.7 50.00 27.27	12 28.0 38.89 100.00	24 24.0 100.00 33.33
Total	44 44.0 61.11 100.00	28 28.0 38.89 100.00	72 72.0 100.00 100.00

Pearson $Chi^2(2) = 5.7935$ Pr = 0.055
Cramer's V = 0.2837
Fisher's exact = 0.051

- Participants' morphine usage non-compliance scores were compared by age category. See Table 8.
- Results from Levene's test of equal variances showed no serious violation of the assumption of similar variances (F (2,69) = 0.428, p = 0.654) (Table 8).

Table 8. Morphine usage by age

Age group	Summary of Morphine usage		
	Mean	Standard deviation	Freq.
≤ 34 years	0.90909091	1.1916012	22
35 – 44 years	1	1.6492423	26
≥45 years	1.75	1.5673295	24
Total	1.2222222	1.5218801	72
W0 = 0.42784063		df (2, 69	Pr> F= 0.65363284
W50 = 0.42559867		df (2, 69)	Pr> F= 0.65508196
W10 = 0.41183690		df 92, 69)	Pr> F= 0.66404977

Comment:

- Results from the Kruskal-Wallis equality of population rank test (with ties) showed a significant difference between at least two of the groups ($\chi 2(2) = 5.386$, p = 0.0495) (table 9).

Tablet 9. The Kruskal-Wallis equality of population rank test (with ties)

Age group	Obs	Rank Sum
≤34 years	22	723.00
35 – 44 years	26	835.00
≥45 years	24	1070.00

Chi^2 (2) = 5.386
Prob = 0.0677
Chi^2 (2) with ties = 6.010
Prob = 0.0495

- Respondents in the 34 or younger and the 35 to 44 age categories both had median non-compliance scores of 0 with an IQR of 2 and 1 respectively.
- Respondents in the 45 and older age category had a median non-compliance score of 1.5 and an IQR of 2. (table 10).

Table 10. Compliance with prescribing morphine by age

Age group	N	p^{25}	p^{50}	p^{75}	IQR
≤34 yrs	22	0	0	2	2
34–44 yrs	26	0	0	1	1
≥45 yrs	24	.5	1.5	2.5	2
Total	72	0	1	2	2

- Associations were found with different age categories for availability of morphine (Q4; χ2(20 = 11.365, p = 0.003, V = 0.3973) and training (Q10; χ2(2) = 7.3669, p = 0.025,
- V = 0.3199) such that a smaller proportion of both younger age categories (34 and younger: 9.09%; 35 to 44 years: 7.69%) indicated problems with availability of morphine in the hospital compared to 45 and older participants (41.67%) and a smaller proportion of participants 45 years and older (25%) indicated having received training in morphine usage compared to both younger age categories (34 and younger: 54.55%; 35 to 44 years: 61.54%).

Although not under the control of the respondents at Pholosong Regional Hospital, the availability of morphine may be a factor influencing the usage of morphine Table 9 illustrates respondents' perception of the availability of morphine.

Table 11. Perception of availability of morphine by age

Age group	Is the availability of morphine in the hospital a problem for you? No	Yes	Total
≤ 34 yrs	20	2	22
	17.7	4.3	22.0
	90.91	9.09	100.00
	34.48	14.29	30.56
35-44 yrs	27	2	29
	20.9	5.1	26.0
	92.31	7.69	100.00
	41.38	14.29	36.11
≥ 45 yrs	14	10	24
	19.3	4.7	24.0
	58.33	41.67	100.00
	24.14	71.43	33.33
Total	58	14	72
	58.0	14.0	72.0
	80.56	19.44	100.00
	100.00	100.00	100.00

Pearson Chi2(2) = 11.3646 Pr = 0.003
Cramer's V = 0.3973
Fisher's exact = 0.006
Table

- Not significant at a 5% level of significance (p = 0.055 > 0.05); but significant at a 10% level of significance (p = 0.055 < 0.1).

4.8. Safety and availability of Morphine and the need for training by ethnic group

Concerning the safety of morphine as an analgesic, 75% (n= 54) of white respondents and 38% (n= 27) of black respondents found that morphine was not a safe analgesic; also, 50% (n= 36) of white respondents and 16% (n= 12) of black respondents reported the morphine availability being a problem. In addition, 72% (n= 52) of black respondents said that they needed training for pain management (Table 12). These differences are significant as shown by the p-value.

Table 12. Safety and availability of Morphine and the need for training by ethnic group

	Ethnic group	Odds ratio	p-value

	Black	White		
Do you think that Morphine is not a safe analgesic?			5 (0.9– 6.7)	0.05
• Yes	24 (37.5	6 (75)		
• No	40 (62.5)	2 (25)		
Is the availability of Morphine in the hospital a problem for you?			5.4 (1.15– 25.2)	0.04
• Yes	10 (15.6)	4 (50)		
• No	54 (84.4)	4 (50)		
Do you need training in pain management?			0.28 (0.19 – 0.41)	<0.001
• Yes	46 (71.9)	0 (0)		
• No	18 (28.1)	8 (100)		

4.9. Morphine usage and Marital status

It is found that 33% (n= 24) of married respondents and 8% (n= 6) of single were uncomfortable prescribing morphine, 25% (n= 18) of married and 8% (n= 6) of single respondents found that morphine availability was a problem, and 17% (n= 12) of married respondents found that legal regulations on morphine prescription were a problem, and 46% (n= 33) of married respondents and 25% (n=18) of single felt that morphine should not be used for pain management. (Table 13).

Table 13. Morphine usage parameters by marital status

	Marital Status		Odds ratio	p-value
	Single	Married		
Do you feel uncomfortable prescribing Morphine?			5.5 (1.14 – 26.35)	0.01
• Yes	2 (8.3)	16 (33.3)		
• No	22 (91.7)	32 (66.7)		
Is the availability of Morphine in the hospital a problem for you?			3.66 (0.74 – 17.9)	0.08
• Yes	2 (8.3)	12 (25)		
• No	22 (91.7)	36 (75)		
Do you feel that legal regulations on Morphine prescription are a problem?			1.2 (1.05 – 1.36)	0.03
• Yes	0 (0)	8 (16.7)		
• No	24 (100)	40 (83.3)		
Do you feel that Morphine should not be used for pain management?			2.5 (0.8 – 7.5)	0.07
• Yes	6 (25)	22 (45.6)		
• No	16 (750	26 (54.2)		

4.10. Morphine usage Parameters by employment position and employment status

Kruskal - Wallis equality of populations rank test for morphine usage by level of employment

- A comparison in the morphine usage non-compliance score by level of employment showed no difference between levels (χ2(2) = 1.687, p = 0.430). (Table 14).

Table 14. Level of employment and morphine usage

Level of employment	Observation	Rank sum
Intern, Com Service	18	563.00
Medical Officer	48	1842.00
Specialist	6	223.00
Chi^2 (2) = 1.512		
Prob = 0.1695		

Chi^2 (2) with ties = 1.687
Prob = 0.4301

Table 15 illustrates the Kruskal - Wallis equality of populations rank test for morphine usage by department.

- A comparison of the morphine usage non-compliance score between participants from different departments showed no difference between groups (χ2(2) = 1.078, p = 0.584) (Table 15).

Table 15. Morphine usage by department

Department	Observation	Rank sum
Casualty/Family Med/ OPD	20	758.00
Obst-Gynae/ Surgery/ Ortho/Ophthal	24	768.00
Internal Med/ Anaesth	24	820.00
Chi^2 (2) = 0.982		
Prob = 0.6121		

Chi^2 (2) with ties = 1.078
Prob = 0.5835

By employment position, it is found that:

- 50% (n=24) of Medical Officers, 33% (n=2) of Specialists, and 13% (n=2) of Interns felt that morphine should not be used regularly for pain management, and 88% (n=14) of Interns and 67% (n=36) of Medical Officers needed training for pain management. (Table 16)

Table 16. Morphine usage parameters by employment position

	Position of employment in the hospital				p-value
	Intern	Community Service	Medical Officer	Specialist	
Do you Feel that Morphine should not be used regularly for pain management?					0.03
• Yes	2 (12.5)	0 (0)	24 (50)	2 (33.3)	
• No	14 (87.5)	2 (100)	24 (50)	4 (66.7)	
Do you need training in pain management?					<0.001
• Yes	14 (87.5)	0 (0)	36 (66.7)	0 (0)	
• No	2 (12.5)	2 (100)	16 (33.3)	6 (100)	

By employment status, it is found that:

- 100% (n=4) of Sessional doctors and 15% (n=10) of Full-time doctors said that the morphine availability in the hospital was the problem, and the same percentage of Sessional doctors and 6% (n=4) of Full-time doctors found that legal regulations on morphine prescription were a problem,
- 100% (n=4) of Sessional doctors and 35% (n=24) of Full-time doctors felt that morphine should not be used for pain management. (Table 17).

Table 17. Morphine usage parameters by employment status

	Employment Status		Odds ratio	p-value
	Sessional	Full-time		

Is the availability of Morphine in the hospital a problem for you?			6.8 (3. – 12.0)	0.001
• Yes	4 (100)	10 (14.7)		
• No	0 (0.0)	58 (85.3)		
Do you feel that legal regulations on Morphine prescription are a problem?			17.0 (6.5 – 43.9)	<0.001
• Yes	4 (100)	4 (5.9)		
• No	0 (0)	64 (94.1)		
Do you feel that Morphine should not be used for pain management?			2.11 (1.65 – 2.73)	0.05
• Yes	4 (100)	24 (35.3)		
• No	0 (0)	44 (64.7)		

4.11. Views by Clinical Departments

The next section summarises views of the items investigated to understand respondents' perceptions of the use of morphine and the factors affecting its use. Concerning their views by clinical departments:100% of OPD doctors, 57% of Obst-Gynae doctors, 33% of Anaesthetists, 33% of orthopaedists, 20% of Surgeons, 20% of Casualty doctors, and 14% of Internal Medicine doctors found themselves uncomfortable prescribing morphine. (Table 18)

Table 18. Morphine Usage Respondents by Clinical Departments who felt uncomfortable in prescribing morphine

Department	Do you feel uncomfortable prescribing Morphine?		p-value
	Yes	No	0.05
Casualty	2 (20)	8 (80)	
Family Med	0 (0)	3 (100)	
Obst-Gynae	4 (57)	3 (43)	
Anaesthetics	2 (33)	4 (67)	
Surgery	2 (20)	8 (80)	
Orthopaedic	2 (33)	4 (67)	
Internal Med	2 (14)	12 (86)	
Management	0 (0)	2 (100)	
Paediatrics	0 (0)	6 (100)	
OPD	6 (100)	0(0)	
Ophthal	0 (0)	2 (100)	

100% of Ophthalmologists and OPD Doctors, 67% of Anaesthetists, 57% of Obst-Gynae, 40% of Casualty doctors, 33% of Orthopaedists, 29% of Physicians, and 20% of Surgeons felt that morphine was not a safe analgesic. (Table 19)

Table 19. Morphine perceived as an unsafe drug by Clinical Departments

Department	Do you think that Morphine is not a safe analgesic?		p-value
	Yes	No	0.04
Casualty	4 (40)	6 (60)	
Family Med	0(0)	3 (100)	
Obst-Gynae	4 (57)	3 (43)	
Anaesthetics	4 (67)	2 (33)	
Surgery	2 (20)	8 (80)	
Orthopaedics	2 (33)	4 (67)	
Internal Med	4 (29)	10 (71)	
Management	0 (0)	2 (100)	
Paediatrics	0 (0)	6 (100)	
OPD	6(100)	0 (0)	
Ophthal	2(100)	0 (0)	

100% of OPD doctors, 43% of Obst-Gynae doctors, 33% of Family Medicine, and 33% of Paediatrics doctors described the availability of morphine in the

hospital as a problem. (Table 20)

Table 20. Morphine availability by Clinical Departments

Department	Is the availability of Morphine in the hospital a problem for you?		p-value
	Yes	No	<0.001
Casualty	0 (0)	10 (100)	
Family Med	1 (33)	2 (67)	
Obst-Gynae	3 (43)	4 (57)	
Anaesthetics	0 (0)	6 (100)	
Surgery	0 (0)	10 (100)	
Orthopaedic	0 (0)	6 (100)	
Internal Med	0 (0)	14 (100)	
Management	0 (0)	2 (100)	
Paediatrics	2 (33)	4 (67)	
OPD	6 (100)	0 (0)	
Ophthal	0 (0)	2 (100)	

100% of OPD doctors, 33% of Family Medicine doctors, 20% of Casualty doctors, 14% of Obst-Gynae doctors, and 14% of Internal Medicine doctors felt that legal regulations on morphine were a problem. (Table 21)

Table 21. Morphine legal regulations as Barrier by Clinical Departments

Department	Do you feel that legal regulations on Morphine	p-value

	prescription are a problem?		
	Yes	No	0.002
Casualty	2 (20)	8 (80)	
Family Med	1 (33)	2 (67)	
Obst-Gynae	1 (14)	6 (86)	
Anaesthetics	0 (0)	6 (100)	
Surgery	0 (0)	10 (100)	
Orthopaedics	0 (0)	6 (100)	
Internal Med	2 (14)	12 (86)	
Management	0 (0)	2 (100)	
Paediatrics	0 (0)	6 (100)	
OPD	6(100)	0 (0)	
Ophthal	0 (0)	2 (100)	

100% of Ophthalmology doctors, 86% of Obst-Gynae doctors, 71% of Internal Medicine doctors, 67% of Orthopaedics doctors, 60% of Casualty doctors, 40% of Surgical doctors, 33% of Family Medicine doctors, and 17% of Anaesthetists stated that they did get some training on morphine usage. (Table 22)

Table 22. Morphine usage training by Clinical Departments

Department	Did you get any training in morphine usage?		p-value
	Yes	No	0.01
Casualty	6 (60)	4 (40)	
Family Med	1 (33)	2 (67)	
Obst-Gynae	6 (86)	1 (14)	
Anaesthetics	1 (17)	5 (83)	
Surgery	4 (40)	6 (60)	
Orthopaedic	4 (67)	2 (33)	
Internal Med	10 (71)	4 (29)	
Management	0 (0)	2 (100)	
Paediatrics	0 (0)	6 (100)	
OPD	0 (0)	6 (100)	
Ophthal	2 (100)	0 (0)	

100% of OPD, Paediatrics and Management doctors; 86% of Internal Medicine and Obst-Gynae doctors; 67% of Anaesthetists, Orthopaedists and Family

Medicine doctors; 60% of Casualty doctors, and 40% of Surgical doctors said that they needed training in pain management.
(Table 23). This is a significant finding.

Table 23. Pain management training needed by Clinical Departments

Department	Do you need training in pain management?		p-value
	Yes	No	0.003
Casualty	6 (60)	4 (40)	
Family Med	2 (67)	1 (33)	
Obst-Gynae	6 (86)	1 (14)	
Anaesthetics	4 (67)	2 (33)	
Surgery	4 (40)	6 (60)	
Orthopaedics	4 (67)	2 (33)	
Internal Med	12 (86)	2 (14)	
Management	2 (100)	0 (0)	
Paediatrics	6 (100)	0 (0)	
OPD	6 (100)	0 (0)	
Ophthal	0(0)	2 (100)	

100% of Anaesthetists, 80% of Casualty doctors, 80% of Surgical doctors, 67% of Orthopaedic doctors, 67% of Family Medicine doctors, 57% of Obst-Gynae doctors, and 29% of Internal Medicine doctors reported that their department had morphine ready on request for pain management. (Table 24)

Table 24. Morphine readiness on request by Clinical Departments

Department	Does your department have Morphine ready on request for pain management?		p-value
	Yes	No	0.006
Casualty	8 (80)	2 (20)	
Family Med	2 (67)	1 (33)	
Obst-Gynae	4 (57)	3 (43)	
Anaesthetics	6(100)	0 (0)	
Surgery	8 (80)	2 (20)	
Orthopaedics	4 (67)	2 (33)	
Internal Med	4 (29)	10 (71)	
Management	0 (0)	2 (100)	
Paediatrics	0 (0)	6 (100)	
OPD	0 (0)	6 (100)	
Ophthal	0 (0)	2 (100)	

Comments

- Most of the doctors or eighty-three per cent (83%) or n=60 who completed the questionnaire thought the questionnaire covered issues that were all linked to morphine prescription.
- However, one doctor thought the questionnaire ought to have included respiratory distress as a problem that was not specifically or directly mentioned in the questionnaire but was linked to morphine prescription.
- The doctors who did not fully complete the questionnaires were twelve (12) or seventeen per cent (17%).
- There were no spoiled questionnaires in the survey because doctors' responses were legible enough.

4.12. Summary of research findings

The quantitative analysis demonstrated the following:

The demographic results exploring morphine prescribing suggest differences in prescribing perception with younger doctors, for women, black doctors and single

doctors were more comfortable in prescribing morphine. Although only sixty-one per cent (61%) of doctors or n=44 stated that morphine should be used regularly for pain management and forty-two per cent (42%) of respondents were of the view that morphine was unsafe to be used as an analgesic.

Generally, eighty-one per cent (81%) or n=58 of the respondents in Pholosong Regional Hospital clinical departments believed that morphine availability was not a problem. However, fifty per cent (50%) or n=36 of the doctors stated that their respective clinical departments had morphine available to be used readily on request for pain control.

Eighty-nine per cent (89%) or n=64 of the respondents agreed that the current South African laws and regulations on morphine prescription and usage were not a problem.

Regarding training on pain management, fourteen per cent (14%) or n=10 of the respondents reported a lack of knowledge in prescribing morphine to their patients for pain control. Seventy-seven per cent (77%) or n=55 of the respondents found that being trained in morphine usage was a very important factor.

There were slightly under half of the sampled doctors or forty-seven per cent (47%) or n=34 of respondents who indicated that they were never trained on how to use the right dosage of morphine to manage pain in their patients. Sixty-four per cent (64%) or n=46 of the respondents confirmed that they needed training in pain management.

CHAPTER 5: DISCUSSION

5.1. Introduction

This chapter will present the explanation and reasoning behind the research result findings. It is arranged following the previous chapter of results, where relevant references will be made to previous studies to reinforce the findings. The study met the objectives to identify the doctors' perceptions of morphine use in pain management among their patients and to identify factors associated with the use of morphine in Pholosong Regional Hospital.

5.2. Demographics of the study population

5.2.1. Age-group and gender

Most respondents in our study were not very different from studies reported in the literature as they were aged between 35 to 44 years old which was the most economically active age group in Pholosong Regional Hospital. This study showed that there were more male than female doctors employed in the hospital. Hence, more male doctors participated as was expected. Further, the situation about doctors' gender disparity in Pholosong Hospital generally mirrored the composition of the South African workplace in terms of age and gender demographics. Specifically, the ratio of male to female participants in this study was 2:1 which meant that male doctors were twice as many as their female counterparts. This was important because it highlights the need for more female students to enrol in medical professional training in South Africa. However, female doctors were more comfortable in prescribing morphine.

In Pholosong Hospital, three (3) age categorizations, namely the younger or first group (less than 35 years old), the middle or second group (35-44 years old), and the older or third group (45 years and more) were grouped for convenience of the research study. Among the females, the majority were in the younger age group probably because there was a deliberate intervention in the country whereby entry into the medical training programs started to focus on increasing female candidates to balance gender in the medical profession. It could have

been possible that we were witnessing one of the outcomes of the implementation of such a national strategy in the hospital.

Almost all respondents were employed full-time doctors because most of them were in older age groups. That meant that the older doctors tended to settle in their professions and attained full-time employment status. Also, it can be inferred that the older medical practitioners had older children who were settled schooling in nearby facilities which could have made them opt for full employment in the hospital. However, there were few session doctors in the hospital mainly because it was in a semi-urban and semi-rural geographical area which meant that there were fewer private general practitioners who could double up with sessional work in the hospital. Frequently, it was that cadre of doctors who worked in the private sector who also was employed on a part-time or session basis in the hospital. That kind of private and public sector partnership was encouraged.

Compared to other reported studies[45,46] whose respondents were the general population, this study utilized hospital doctors which had implications for the outcome of the study. Being in a remote area in the East Rand, it was relatively difficult to attract health professionals including doctors to work and settle in the area. Therefore, it was observed that doctors who had no South African permanent residence status were also employed and were mainly on temporary work contracts. Hence, there were differences among doctors in Pholosong Regional Hospital in the way they prescribed pain medications. Suffice it to say, participating doctors who were non-South African graduates were more in number on staff establishment than local graduates. This finding could be an innovation utilized by hospitals for the retention purposes of foreign-trained health professionals in remote and rural areas of South Africa.

In contrast to our study, there is an international study, a qualitative systematic review, done by Nickel and Raspe[37] on the use of services in treating chronic pain and combined it with pain prevalence studies across large study populations and cultures. In their study, respondents' age peaked between 45 and 65 years. The majority were women. The reason for the gender and age differences in the Nickel and Raspe[37] study was attributed to the fact that more women were readily available to participate in the study compared to men because the general

population had more females. In additional studies[32-34], the large study populations from multiple centres across the globe showed almost equal genders, though females were slightly more. Ospina and Harstall[37] used a multinational study with collaborating centres in 16 countries on four continents with a mean age of 35.2 to 51.4 years, in contrast to our study which had a single site.

5.2.2. Category of staff and clinical disciplines

Bateman[26] showed that for South America, Africa, and the Indian sub-continent, knowledge of pain management proved extremely poor at the undergraduate level, particularly. The challenges faced by Pholosong Hospital doctors from all the above clinical disciplines regarding the prescribing of pain analgesics were in keeping with sentiments expressed by Bateman[26] who showed that there was little or no formal education devoted to pain education in healthcare training programs in developing countries. Arguably, Bateman[26] painted a picture that showed neglect of pain patients suffering in silence, worse so in developing countries. Our results showed limitations in the doctors' perceptions regarding the use of morphine.

This section could not be compared to previous studies because others used different aspects or attributes of the general population. Hence, attitude to prescription habits was not a feature in those studies. However, it was not surprising that interns were mainly in the younger or first group and middle (second) age groups because it was expected by their clinical experience. The medical officers represented more than a third of participating doctors and were in the middle age group of 35-44 years old, again according to their clinical experience which was more than that of interns. Most participating doctors were medical officers who were in the older or third age group of at least 45 years old. Also, the majority did not specialize in any branch of clinical medicine probably because they were non-South Africans which made it difficult for them to enter a postgraduate training program in South Africa.

The few medical specialists all belonged to the older age group of 45 years old

or more. This finding was important because it highlighted the fact that doctors who are less than 45 years old did not have specialist qualifications at Pholosong Regional Hospital. As already stated above this was related to the fact that most doctors were medical officers probably because they were non-South Africans. However, medical specialists tended to be older. Therefore, the older the doctor was, the more likely he was to possess a medical specialist qualification. The weakest part of the finding was that the number of participating medical specialists was too low to make a meaningful generalization to other regional hospitals. Being a critically scarce resource, the contribution from anaesthesia was low and comprised doctors from the middle age group and even fewer among doctors in the younger and older age groups.

Most of the respondents from A&E were from the first group followed by the middle group because the accident and emergency unit were the face of the hospital since all emergency and sometimes non-emergency cases were presented there. It was assumed then that the older doctors might have pulled out of the unit with time. Also, it was unlikely that the accident and emergency would be involved in the prescription of long-term morphine use except in acute situations.

Doctors from Internal medicine who contributed to the study were mainly from the middle age group and fewer from the older age group because the doctors' experience also suited them for the task. The younger the doctor was the less likely one was to be in internal medicine. Perhaps, the more experienced doctors found it comfortable to work in that department. Practically, internal medicine was less tasking compared to surgical disciplines; hence the department had attracted middle and older doctors.

Generally, pain control in surgery was more for acute than chronic cases, unless the acute phase was poorly controlled which might lead to chronic pain. The doctors from the general surgery department were few because this clinical discipline was a scarce competency and needed highly skilled medical officers. However, for an unknown reason, there were more younger doctors in the general surgery department than older doctors. Perhaps the younger doctors were allocated or coerced into general surgery because middle and older age group doctors perceived it as more tasking than other clinical disciplines.

5.3. Barriers to morphine use and pain management

From the INCB[44] surveyed countries, the main factors that affect the opioid availability for medical needs included: the absence of policy, insufficient supply, difficulties in distribution, cost, administrative burden, legal restrictions, insufficient training for professionals, and reluctance to prescribe or stock-controlled substances and concerns about addiction.[36]

In this study, doctors' fear of the use of morphine for pain management was due to possible side effects and their lack of knowledge as mentioned above.[37] Both greatly contributed to barriers to morphine and other opioid use and pain management. Hence, pain management services were limited in the hospital.

Insufficient medical use of opioids resulted from opiophobia by both healthcare providers and regulators and among patients and their families.[1] Pholosong Hospital doctors' concerns appeared to link directly to opiophobia and lack of training in pain management. Further, The Lancet Commission authors suggested the perpetuation of a negative feedback loop of poor access to opioids by mainly the vulnerable people because of unbalanced laws and excessive regulations by governments. Hence, the need for opioids could easily be underestimated resulting in less supply of opioids available for medical use.[1] Naturally, if doctors did not request morphine and other opioid analgesics, the supply and availability of those drugs would be less.

5.4. Attitudes and knowledge of pain management

Doctors thought morphine was an unsafe medication and it is a concern that this may still be the accepted teaching in medical schools. Despite the problems of opioid misuse and overdose which caused dual opioid crises in America, morphine and other opioids use can be safe in trained hands.[2,44,45,46] However, the important realization in this study was that the same doctors who did not appear to use morphine expressed concerns about morphine safety.

Doctors who did not fear side effects due to morphine use in their patients correlated well with the question of morphine safety because those doctors who thought morphine was a safe analgesic did not also fear morphine's side effects

in their patients. It is important to note that some doctors did not have a good perception of the usage of morphine in their patients although they reported that they did not fear morphine's side effects. The fact that doctors did not have a good perception of using morphine regularly meant that the demand for morphine would be less and availability would be affected by negative feedback as reported by Knaul et al.[1]

However, it was interesting to analyse further the doctors' views on the regular use of morphine for pain management among different age groups. The younger doctors, being fresher from medical school, appeared to have used morphine more regularly than older doctors. The finding highlighted the need for Pholosong doctors' skills and information dissemination in pain management.[1,45,46]

5.5. Availability of morphine

The availability of morphine and other opioid analgesics in much of the world remains very limited, depriving many patients of essential medicines. This is despite numerous efforts by the INCB and the WHO, as well as NGOs. Suffice it to say, that narcotic drugs and psychotropic substances are recognized by international drug control treaties to be indispensable for medical and scientific purposes.[38]

In this study, morphine availability was assessed in the clinical department's readiness to access and use morphine when requested by doctors who worked there. Doctors' responses on morphine availability split them in half which highlighted the differences in their level of knowledge and skills. The lack of morphine readiness in clinical departments was most pronounced during emergencies. Suffice it to say, the hospital or central pharmacy stocked morphine all the time but the doctors' demand for it was low. Knaul et al.[1] showed that if morphine and other opioid analgesics were not needed regularly by doctors the supply of morphine would be less as it would not be procured from manufacturers.

In South Africa, morphine was readily available in all hospitals and that was extended to primary health care clinics.[20,47] If sufficient knowledge and skills were present among hospital doctors and managers at the time, they would have collaborated well with hospital pharmacists to implement an inventory system for

checking and monitoring morphine availability throughout the hospital.

According to Brennan,[5] the availability of morphine and other opioid analgesics for palliative care and pain management was needed for the dignity and the right of patients dying in moderate to severe pain. This was supported by Gwyther who particularly highlighted the case of South Africa where morphine and other opioid analgesics were needed in cancer, advanced HIV, and multiple drug resistance tuberculosis patients because they were common conditions.[47] The availability of treatment guidelines or algorithms in the hospital on morphine use for pain management was not displayed on notice boards, something which would have assisted the doctors and patients in that regard. The latter is supported in other parts of the world including South Africa.[12,35,45]

5.6. Morphine availability under South African law and regulations

As observed in the INCB[44] report, the distribution of controlled substances (morphine and other opioid analgesics) could be impeded or prohibited altogether by burdensome laws and regulations.[36] The amounts and substances prescribed by the doctor may also be limited by law and regulations. The production, procurement, storage, distribution, prescription, dispensing, and administration of opioid analgesics (and other controlled medicines) are all subjected to laws and regulations throughout the world.[44]

In South Africa, morphine availability was not a problem in the hospital because it was on the formulary and always stocked, although it was hardly used due to individual doctor's reasons.[25] The main reason for underutilized morphine was that some doctors feared the drug's side effects. Therefore, the doctors exhibited a lack of knowledge, lack of skills, and lack of competency in pain management. Doctors' views on morphine availability in the hospital under the South African law and regulations were perceived as restrictive in this study, but that observation by doctors was contrary to the reality because it is found in the South Africa Essential Drug List.[47]

Hence, nearly all doctors claimed that morphine was a highly scheduled drug, and it needed specific indications and correct documentation for its prescription to the patients. They were concerned about improving the patient's pain, but they felt that there were too many administrative delays such as unlocking morphine

from storage before it could be administered to the patient. During all that time, the patient could suffer from pain in silence and unnecessarily.

Despite how doctors perceived the above delays regarding morphine use, they still had an obligation to always protect the patients' human rights to freedom from pain and advocate for the patient's autonomy.[3,7] The doctor should do good, not harm the patient, uphold the patient's autonomy, and respect the patient's rights to distributive justice. Unfortunately, it seemed doctors withheld resources when the situation did not warrant it just because of their lack of skills to manage pain effectively as observed above.[26,45, 46]

Further, the South African laws and regulations on morphine prescription and usage are not as strict as perceived above. Morphine was made a scheduled or controlled drug to monitor its appropriate medicinal use, potential misuse, and abuse without denying deserving patients its use. A few doctors indicated that the law itself was not the main problem but that using morphine in their patients needed patience. The fact is that morphine is often locked away being a scheduled drug and its usage correctly demands complete and appropriate documentation which took time to accomplish. Several doctors cited administrative difficulties as the main objective that discouraged them from using morphine and this was supported by some reports.[44,48]

5.7. Impact of morphine and other opioid analgesics on patient care

Dowell et al.[12] reported the challenging nature of guideline-concordant patient care. The authors argued that it took time and effort to implement recommendations with individual patients. For instance, the process of receiving high-dose medications, and engaging and supporting patients to adjust their dosage may have unintended consequences. Hence, doctors may find it easier to refer or dismiss patients from their care. There could be situations in which the benefits might outweigh their risks, where doctors might universally stop prescribing opioids altogether due to the neglect of the patient. Further, Dowell et al.[12] stated providing lifesaving information and treatment, doctors ought not to dismiss patients from care because that constituted patient abandonment which might adversely affect patient safety and missed opportunity.

The authors highlighted that the appropriate and safe reduction or discontinuation of opioid use, patient education, benefits, and risk assessment and mitigation all resulted from the effective implementation of guidelines by doctors[12]. That meant doctors should have had no shortcuts to safer opioid prescribing to achieve effective pain control in their patients.

According to Paice,[10] palliative care was viewed as a multidisciplinary approach whereby specialized medical care pain control was the cornerstone. It is aimed at relieving symptoms, pain, and physical, emotional, and psychosocial stressors in the terminal diagnosis or life-limiting illnesses. Because the family needed comfort while grieving, Paice[10] reported that palliative care did not end when the patient died. The author mentioned physical symptoms and other aspects that were the focus of palliative care including cancer and non-cancer pain, nausea, loss of appetite and confusion, and emotional and spiritual spheres. Also, social, and cultural needs, patient respect, and dignity must all be considered. Contrary to views by Paice[10], the majority of Pholosong doctors did not prescribe opioids because of fear of side effects in their patients. Worse, palliative care services did not exist, and patients were left dying in needless discomfort and pain.

5.8. Requirements for training in morphine use and pain management

Doctors' knowledge of morphine dosage in pain management was inadequate. Almost all doctors agreed that morphine dosage was not the reason why they did not prescribe it to their patients. Yet, the doctors' usage of morphine for their patients was low, even when the indication was clear. Hence, one is inclined to believe that doctors could not be taken seriously in this regard because their views were contrary.

It was highly unlikely that doctors who rarely prescribed morphine could have ever remembered the correct morphine dosage without the use of a formulary. What could have helped the doctors' situation was to reinforce treatment guidelines as reported by Dowell et al[12] and/or algorithms and display them in the wards and consulting rooms to depict the correct use of morphine. The hospital clinical managers should have ensured that the utilization of guidelines and/or algorithms were implemented and monitored for sustainability and quality

care.

In agreement with several reports,[2,25,30] most doctors mentioned that morphine was very helpful in relieving pain and that it was good analgesia. However, the doctors were also afraid of using it because of known side effects and the perceived risk of addiction.[14]

Further, the doctors' knowledge of morphine was important, although they recognized that they were inhibited by their lack of proper training in pain management and the use of morphine. Importantly, it was not easy to ascertain doctors' perceptions.

The WHO[9] demonstrated insufficient knowledge regarding pain management among healthcare workers. It reaffirmed that morphine use was capable of relieving pain in more than ninety per cent of cancer patients when used correctly in the hands of trained personnel.[9] In this study, doctors who lacked experience in prescribing morphine made it very difficult for medical practitioners to provide quality pain management to deserving patients in the hospital. The finding highlighted the urgent need for skills or capacity building to empower the doctors and other staff on how to use morphine in pain management for the patient's benefit.

Further, considerable doctors lacked experience in morphine use. The finding revealed the situation whereby the patients' right to freedom from pain was breached by hospital doctors. Worse, doctors did not even realize that their lack of experience and inadequate knowledge in morphine prescribing was a problem. In the end, patients suffered at the hands of those who could have advocated for their comfort and dignity. Probably, one of the most important interventions Pholosong doctors could make in their patients was to eliminate pain and suffering by prescribing morphine appropriately after training.

The doctors might have underreported their lack of knowledge and training in morphine use. For them to appear competent and protect their prescribing habits, doctors might have offered misleading responses. To make the situation even more complicated, most of those doctors were not local graduates which might have brought the quality of their basic medical training into question.

In a report by Open Society Public Health Program's International Palliative Care Initiative (IPCI) and Law and Health Initiative (LAHI),[49] the question of reducing fear of prescribing palliative care medications was explored. In that session, four steps to ensure regulators and prescribers worked in tandem were considered including the prescribers/doctors' collaborating with others, knowing, and clarifying WHO guidelines,[9] accessing essential medication, and advocating for patients. Therefore, knowing the local barriers that hinder access to medicines including regulations and policies was critical.[49]

Clearly, success in the above areas by Pholosong doctors would demand fast-tracking doctors' knowledge and skills acquisition through refresher courses, continuous medical education, formal training, and follow-through. The lack of knowledge of palliative care highlights the need for continuing education and adequate training for all hospital community-based healthcare providers and other caregivers, including nongovernmental organization workers and family members.[48]

5.9. Ethical responsibility of healthcare professionals to pain and suffering

By failing to use morphine in compliance with WHO guidelines, Pholosong Hospital doctors did not honour the UN conventions and international human rights articulations on pain relief years ago[7]. The UN pronouncements indicated the right of "everyone to the enjoyment of the highest attainable standard of physical and mental health" as described in the International Covenant on Economic, Social, and Cultural Rights (ICESCR).[6] Although no explicit right to pain relief was expressed in the foundational human rights covenants themselves, pain relief is an implied universal human right. Hence, "no one shall be subject to inhuman or degrading treatment" according to Article five (5) of the Universal Declaration of Human Rights.[8]

Subsequently, the World Health Assembly (WHA)[4] resolution on palliative care reiterated the ethical duty of healthcare professionals to alleviate pain and suffering. However, the use of controlled medicine appropriately for the relief of pain and suffering remains insufficient in many countries, mainly due to a lack of knowledge among healthcare workers and constrained resources.[7,8,10]

To make sure the prevention of diversion of narcotic drugs and psychotropic substances, should not result in inappropriate regulatory to medical access barriers to these drugs, the United Nations Office on Drugs and Crime and the INCB efforts made possible the “availability and appropriate use of internationally controlled medicines, particularly for the relief of pain and suffering.[38]

Doctors should have used morphine when needed for pain management thus respecting patients’ rights and recognizing the need for palliative care across diseases affecting all age groups in the hospital. Of particular importance in the hospital were non-communicable and infectious diseases, including HIV and multidrug-resistant tuberculosis which was rife in South Africa.

Considering Universal Health Coverage (UHC) for the country and Pholosong Hospital, the inclusion of palliative care is welcomed. It is important to emphasize the health services needed for providing integrated palliative care in a manner that is equitable to address patients ‘rights. Generally, UHC dictates the need for adequate provision of medicines including morphine and other analgesic medications, especially in Pholosong Hospital, South Africa, and other developing countries. In the WHO global monitoring framework for the prevention and control of non-communicable diseases and their interventions, the inclusion of palliative care actions and indicators was appropriate to increase access to palliative care.[1,49]

The non-governmental organizations and civil society efforts in continuing to highlight the importance of palliative care that includes, for medical purposes, adequate availability and appropriate use of internationally controlled substances must be appreciated by all stakeholders. These issues are emphasized in the United Nations international drug control conventions.[3,6,49] That said, there was a need to create or strengthen, as appropriate, clinical guidelines or utilize standard operating procedures including palliative care as an integral component of pain management within the continuum of care in the Pholosong Hospital rural community. Hence the emphasis would be placed on the avoidance of suffering for pain patients and their families because standard treatment guidelines and essential medicines list existed as a document made available in the hospital from the national department of South Africa.[47] A reasonable hospital doctor

could have checked the indications of morphine, doses, and side effects from the said guidelines to manage patients better. The doctors' and clinical leadership's failure to reinforce clinical guidelines and implement, where appropriate, palliative care policies to support good pain patient care was both ethically and unprofessionally unacceptable.[3,6,31,32]

Interestingly, morphine was considered unsafe to use in their patients by doctors because of the unfounded fear and lack of knowledge about the drug. This finding highlighted the need for further training on the role of morphine usage in pain management as reported by Gwyther.[48] The World Health Assembly[4] identified that "palliative care is an ethical responsibility of health systems". Therefore, it is "the ethical duty of health care professionals to alleviate pain and suffering," holistically, irrespective of whether the disease or condition could be cured or not. "The end-of-life care for individuals remains among the critical components of palliative care.[1,4]

The United Nations International Drug Control conventions[50] contributed to the realization of the right to the enjoyment of the highest attainable standard of health and well-being. It encouraged "access to palliative care and essential medicines for medical purposes from controlled substances, including opioid analgesics such as morphine".[50]

5.10. Lessons from the United States of America experience

As described earlier, more than 40-54 million people require palliative medications annually.[20,48] The increased need for palliative care was evident in the ageing populations, the non-communicable and other chronic diseases, and in children globally. Therefore, the quantities of the internationally controlled medicines needed estimation, including paediatric formulation medicines were to increase in tandem.[49]

Knaul et al.[1] reported that "lack of attention to palliative care was also the result of developments in the science of medicine. In much of medical history, the palliation of suffering was the core of medicine and was practised by all doctors, largely because so few effective interventions were available to cure patients."

That changed as technology and medical science accelerated which improved access to opioids and other analgesics.[1]

As medical science evolved, doctors were increasingly focused on the prevention or cure of diseases, injuries, and illnesses, which marginalized the concern of palliating suffering and maximising dignity at life's end.[1,7,8] By contrast, palliative medicine principles and institutional settings for providing terminal care were created. Hence, palliative care has developed into a specialized field of medicine in the USA and other developed countries. [8,9,26]

Wee et al.[2] reported opioid problems in the USA in their policy review of 2019. The authors described weaknesses in the law and the increasing demand from recreational users resulting in the policy review. and the undesirable effects the opioids were attributed to the medical profession. Also, they noted that opioid diversion was a global phenomenon for over 30 years which had led to increased adverse events among the users including addiction, criminal behaviour, conflicts, and overdose deaths.[2,13]

In the USA alone, more than 70,000 died from drug overdoses in 2017 which was reported by the CDC.[12] Despite the implementation efforts from the implementation of policies, deaths continued to soar. Several causative factors were identified including easy opioid accessibility, misuse of opioids as street drugs, illegal supply of opioids, and opioid addiction. The prescription of pain relievers, heroin, and synthetic opioids such as fentanyl was the main reason behind the misuse of and addiction to opioids through healthcare professionals' excessive drug prescribing of over-the-counter opioids. Subsequently, the opioid crisis in the USA increased and affected public health as well as social and economic welfare.[2,13]

Another wave of the crisis happened because there were patients whose pain was previously controlled but now had difficulties in accessing pain medications due to regulatory controls and other measures as a response to the crisis. Suicide, uncontrolled pain, and serious withdrawal symptoms resulted from the inappropriate discontinuation of opioids in patients who were physically dependent on them for pain management.

However, a similar misfortune could be avoided in South Africa through proper monitoring and health care professionals' compliance with the regulations for the use of opioids in patients suffering from chronic cancer and non-cancer pain. Appropriate assessment and management of pain following accepted clinical guidelines with both pharmacological and non-pharmacological interventions will assist in managing pain for patients experiencing chronic pain conditions. Also, improved access to medication-assisted treatment would assist people who have become addicted to medication. In addition, better monitoring and regulation of opioids prescribed by doctors could be useful.

The opioid analgesic dose, duration of treatment, the type of pain, and the physical and psychological attributes of the patient are some of the factors to consider when deciding to maintain, discontinue, or decrease therapy in an opioid-dependent patient.[14] Serious withdrawal symptoms, worsening of the patient's pain, or psychological distress, must be managed, accordingly. There must be a patient-specific plan to gradually taper the dose of the opioid and ensure ongoing monitoring and support.[12,13,28.44]

However, there is no one-size-fits-all standard opioid tapering schedule suitable for all patients. The most prudent approach in our context is to use a combination of interventions so that the effect could be clear on different fronts in the country.[2,13]

5.11. Study limitations

To mitigate weaknesses in the study, the questionnaires were distributed and collected by assistants who did not personally know the doctors. However, doctors might have read about morphine before participating because the study information had been announced or shared in meetings earlier. So, potential respondents might have known what the study was about, and it could have been easy for a doctor to read up on the topic before participating resulting in information bias.

The research study could not be generalized to all regional hospitals or facilities in South Africa because of geographical and cultural variations throughout the

country. The selection of participants and the language used in the study were highly biased toward doctors and English speakers since the sampling was a convenience sampling. Hence, there was an influence on findings because of selection, information, or communication biases. Nevertheless, doctors were the most appropriate choice of participants because they were the prescribers of morphine.

The convenience sampling method was not the best, but because of time and budget constraints, it was still valid and appropriate to apply in this study. Also, the study objectives chosen by the researcher specifically address associations between different variables. Hence, there was little analysis demonstrated in that respect. A qualitative method involving in-depth interviews or focus group discussions would have been the best research methodology employed to explore and describe views, opinions, and experiences. The exploratory and descriptive approach of the qualitative study would better demonstrate doctors' views on morphine usage in the hospital.

A further compromise in the findings was attributed to the fact that doctors joined the study on different days during the one month of data collection. Findings from those doctors who participated later might have been affected by discussions in the corridor among doctors who had completed the questionnaire earlier. Discussions in the Friday meetings during information sharing might have compromised research findings in the end.

The tests of reliability of the morphine usage item set was assessed using the Kuder-Richardson coefficient and it was found that four items – items 4, 6, 8, and 10 - showed low item-rest correlation. This would have affected the reliability of the survey answers so less emphasis could be put on the foundation question as to whether morphine should be used regularly in the management of pain. Instead, the question as to whether doctors felt comfortable using morphine became the key question and revealed that a significant proportion of doctors did not feel comfortable using morphine.

The study would have been strengthened by one-on-one interviews with doctors to explore their prescribing practices and experience of using morphine in greater depth.

5.12. Summary of significant discussion points

This study showed that the doctors who did not fear morphine's side effects on their patients also thought morphine was a safe analgesic for use in their patients. It is important to note that doctors did not have a good perception of the usage of morphine although they reported that they did not fear its side effects. South African laws and regulations on morphine prescription and usage are appropriate and morphine is a scheduled or controlled drug to monitor its appropriate therapeutic use and to discourage the potential misuse and abuse.

The use of morphine regularly for pain management was perceived as an acceptable practice by only a third of doctors mainly among the younger age groups. The formalization of doctor's continuing education, re-skilling, and of information dissemination in pain management is highlighted as a great need in this area. The PainSA efforts to reach all doctors with training in pain management is to be commended and supported.

As described by Cassell[25], the use of morphine includes careful explanation to patients and carers, reassurance regarding the beneficial effects of morphine, and explanation and reassurance regarding side effects, most of which are temporary. This is important to promote patient well-being through pain control.

Generally, morphine usage experience was lacking among doctors and this finding revealed the situation whereby several doctors did not realize their shortcomings and that they might have breached the patients' right to freedom from pain. The doctors might have under-reported their inadequacies to protect their professional standing because most of them were not local medical school graduates. The above might have complicated the situation and brought the quality of their medical training into question.

CHAPTER 6: CONCLUSION AND RECOMMENDATIONS

6.1. Conclusions

Most doctors responded to all matters related to their perception and knowledge of morphine usage without leaving out issues in the questionnaire. Hence, it can be confidently concluded that the tool was user-friendly enough for this research process to meet its study objectives to identify the doctors' perceptions and knowledge of morphine use in pain management among their patients and identify factors associated with the hindrance of morphine use in Pholosong Regional Hospital.

Information or data obtained from doctors was critical in designing the framework to develop morphine usage intervention in the hospital to tailor the individual physicians' situation in managing pain in their patients. Doctor-related factors included internal factors such as their trust and belief in morphine usage, their motivation to administer morphine, knowledge of morphine prescription, and intense fear of using opiates (opiophobia).
The study demonstrated significant findings in most doctors in Pholosong Regional Hospital who had inadequate knowledge of morphine use and were not trained or skilled enough in the use of morphine for pain control in their patients.

Lastly, there was an urgent and great need to ensure morphine was readily available when requested for pain management in and outside emergencies because failure to relieve could lead to many untoward consequences for the patient.

6.2. Recommendations

As a result of the findings of this study, the researcher wishes to make the following recommendations at the hospital level:

- Upon receiving the study report, Pholosong Hospital executive managers should take the lead in **initiating partnerships with Non-Governmental Organisations (NGOs)** to encourage pain management programs that will help

to reduce vulnerability to pain and suffering among patients,

- There should be more **regular in-service training** for all hospital doctors, nurses, and community health workers on pain management and the implementation and utilization of pain management guidelines,
- There should be an urgent **holistic assessment and evaluation** of clinical care for adult patients suffering from moderate to severe pain to minimize adverse health outcomes,
- Establish a hospital multidisciplinary team to raise awareness about pain management needs for patients as a matter of urgency,
- The two clinical managers who were in the hospital should immediately develop and **implement pain management guidelines** and, in collaboration with the hospital pharmacy, **ensure the availability of morphine** and other palliative care drugs in all parts of the hospital,
- Implement standardized pain and other terminal symptoms **tools for routine assessment** as part of patient admission, in-patient care, and follow-up in hospital documents. That should ensure that the identified symptoms are managed to minimize patients' pain and suffering as guided by WHO and WHA.

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APPENDIX 1

Information Sheet

Good day!

I am Dr Nzale Nzali N. Arnold, a research student from the School of Public Health and Family Medicine at the University of Cape Town. I am doing a study to check problems faced by doctors when prescribing morphine sulphate for the management of pain in dying patients, as part of my final year of study toward the degree of Master of Philosophy in Palliative Medicine (MPhil Pall Med).

Thank you for taking the time to hear about this research and decide whether to participate in the study.
To find out what problems you may have prescribing morphine sulphate, I request that you

answer a set of questions using a questionnaire. Participation in the study will take about 10 minutes of your time. This is a confidential interview and your name will not be recorded.

The study does not present risks and only asks for your time to complete the interview. There should be no more than your normal lunchtime.

Why am I doing this? The study will also help the hospital to identify areas in which doctors are having problems in prescribing morphine thereby assisting in the improvement of the care provided to patients seen at the hospital.

Are there benefits to the participants? There is no direct benefit to you by participating in this study and there is no financial gain.

The study is voluntary. If you refuse to participate in the study there will be no penalties. You will be considered like those who participated. You can stop participating in the study anytime you feel like stopping and there will be no penalties.

Confidentiality: All the information that you give in this study will be kept strictly confidential. The consent form that you will be asked to sign will be securely stored and access will be limited to the research team. The results of the study will be presented in a confidential manner and no information which could enable anyone to identify you personally will be reported.

If you want any information regarding your rights as a participant or complaints regarding this study, you may contact the University of Cape Town, Human Research Ethics Committee (HREC),

Mrs Lamees Emjedi

Human Research Ethics Committee
E 52, Room 24, Old Main Building, Groote Schuur Hospital,
Observatory Telephone: 021 406 6492
Fax: 021 406 6411

If you are happy to participate in this study, please read and complete the questionnaire below.

Thank you.

Dr Nzale Nzali N. Arnold, Principal
Investigator Pholosong Hospital, Internal
Medicine Dpt 1067 Ndaba Street, Tsakane
1550
Tel: 011 812 5000; Cell: 078 127 2029; Email: annzale@yahoo.fr

APPENDIX 2

Consent form for: MORPHINE USAGE IN THE MANAGEMENT OF PAIN BY DOCTORS IN PHOLOSONG HOSPITAL

1. I confirm that I have read and understand the information sheet and have had the opportunity to ask questions.

2. I understand that my participation is voluntary and I am free to withdraw at any time, without giving a reason, without my care being affected.

3. I agree to take part in the above study.

Name _____

Signature_____ Date _____

Researcher: Signature_____ Date: _____

Witness: Name

(From clinical team or family member)

Signature_____ Date:

APPENDIX 3

QUESTIONNAIRE

MORPHINE USAGE IN THE MANAGEMENT OF PAIN BY DOCTORS IN PHOLOSONG REGIONAL HOSPITAL

Rec No: 001- 080

SECTION A: **SOCIO-DEMOGRAPHIC CHARACTERISTICS**

1. Age (in years): .....
2. Gender: (1) Male (2) Female (3) Intersex/ Transgender
3. Marital status:

   (1) Single (2) Married (3) Living with partner (4) Divorced
   (5) Widowed (6) Separated

4. Level of education:

(1) Intern (2) Community Service (3) Medical Officer
(4) Registrar (5) Specialist

5. Employment status: (1) Full-time employed (2) Sessional

6. Which department are you working? (Read out names)

   (1) Internal Medicine (2) Casualty (3) Anaesthesia (4) ICU
   (5) Other (Please specify) .....

SECTION B: MORPHINE USAGE

7. I am going to ask you some questions related to problems you face when prescribing morphine sulphate. If you have no problem, you answer No, and we shall move to the next question.

If you have any problem in prescribing morphine, you should answer Yes.
If you answer Yes, I would like you to tell me how important this problem is to you;

where (1) = Not very important factor, (2) = moderately important factor,
(3) = Very important factor.

Factors	Responses				
(1). Do you feel uncomfortable prescribing morphine?	No	Yes:	1	2	3
(2). Do you think that morphine is an unsafe analgesic?	No	Yes:	1	2	3
(3). Do you fear morphine side effects to your patient?	No	Yes:	1	2	3
(4). Is the availability of morphine in the hospital a problem for you?	No	Yes:	1	2	3
(5). Do you feel that the legal regulations to morphine prescription a is problem?	No	Yes:	1	2	3
(6). Do you feel that morphine should be used regularly for pain management?	No	Yes:	1	2	3
(7). Is the morphine dosage the reason why you do not prescribe?	No	Yes:	1	2	3
(8). Does your department have morphine ready on request for pain management?	No	Yes:	1	2	3
(9). Do you experience lack of knowledge in prescribing morphine?	No	Yes	1	2	3
(10) Did you get any training in morphine usage?	No	Yes	1	2	3
(11). Do you need training in pain management?	No	Yes	1	2	3
(12). Do you know any other problems that I did not talk about, you think are for -morphine prescription?	No	Yes			
If yes, can you tell me which problems these are and how they influence your treatment? 13..... 14..... 15.....			1 1 1	2 2 2	3 3 3

10 December 2014

HREC REF: 837/2014

Dr L Gwyther
Public Health Family Medicine
Falmouth

Dr

PROJECT TITLE: MORPHINE USAGE IN THE MANAGEMENT OF PAIN BY DOCTOR PHOLOSONG HOSPITAL (MPhil candidate - A Nzali)

Thank you for your letter to the Faculty of Health Sciences Human Research Ethics Committee December 2014.

It is a pleasure to inform you that the HREC has **formally approved** the

Approval is granted for one year until the 30th December 2015.

Please submit a progress form, using the standardised Annual Report Form if the study con beyond the approval period. Please submit a Standard Closure form if the study is complied the approval period.
(Forms can be found on our

Please quote the HREC REF in all your correspondence.

We acknowledge that the MPhil student, Dr Arnold Nzali will also be involved in this st

Please note that the ongoing ethical conduct of the study remains the responsibility of the pri investigator.

sincerely

PROFESSOR M BLOCKMAN
CHAIRPERSON, FHS HUMAN RESEARCH ETHICS COMMITTEE
Federal Wide Assurance Number: FWA00001637.
Institutional Review Board (IRB) number: IRB00001938
This serves to confirm that the University of Cape Town Human Ethics Committee com to the Ethics Standards for Clinical Research with a new drug in patients, based on the Medical Research Council (MRC-SA), Food and Drug Administration (FDA-USA), International Convention Harmonisation Good Clinical Practice (ICH GCP) and Declaration of Helsinki guidelines.

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