EXPLORING THE ROLE OF CLINICAL PHARMACISTS IN PALLIATIVE CARE: IMPROVING THE QUALITY OF LIFE FOR CANCER PATIENTS

BY

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BEING A DISSERTATION SUBMITTED TO THE DEPARTMENT OF CLINICAL PHARMACY AND PHARMACY PRACTICE, FACULTY OF PHARMACY, UNIVERSITY OF BENIN, BENIN CITY.

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APRIL, 2024.

CERTIFICATION

This is to certify that this project work was carried out by Polo Luke Ede in the department of Clinical Pharmacy and pharmacy practice, Faculty of Pharmacy, University of Benin, in partial fulfillment of the requirement for the award of Doctor of Pharmacy.(PharmD) Degree.

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Polo Luke Ede **Date.**

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Dr. M. I Osarenmwinda **Date.**

…… ……..

Prof (Mrs.) S. F Usifoh **Date.**

DEDICATION

This work is dedicated to all those who continually make determination to succeed despite limitations most especially my bosom Victoria Efetobore and Dr. Polo Paul. Also to all health frontiers who dedicate their lives serving humanity.

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My profound gratitude goes to Almighty God the one who sees and holds my existence. Whose love and grace has continually spurred me on this path of success. God has been my rock and major support.

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I also acknowledge my dear friend; Emoefe, Spencer, Emmanuel, Peace and by extension all my course mates. It's my ardent prayer that God will bless and protect you all. And also grant all your heart desires. In Jesus name AMEN.

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LIST OF ABBREVIATIONS

BSA	**body surface area**
COPD	**chronic obstructive pulmonary diseases**
CYP	**Cytochrome p450**
EGFR	**Epidermal growth factor receptor**
FDA	**Food drugs Association**
FMEA	**Failure mode and effects analysis**
GQD	**Global quality of Death**
MAS	**Multigated acquisition scans**
OPS	**Objective prognostic score**
UCH	**Universal health coverage**
SDG	**sustainable development goal**
WHO	**Word health organization**
NCDC	**National center for disease control**

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ABSTRACT

Background: with absolute certainty, the growing number of people with end stage diseases such as cancer and life limiting illness has become a global health concern and therefore requires a paradigm shift into the provision of an effective palliative care which should encompass the contribution of all healthcare professionals regardless of the practice setting.

Objective: The objective of this study is to explore and provide evidence of the role of clinical pharmacist in the palliative care of cancer patients in other to improve the quality of life of the patients.

Method: This study is questionnaire-guided survey among registered pharmacists working in the two selected tertiary hospitals with established palliative care and cancer (oncology unit) services which are University of Benin and Central hospital, Benin City. Data was collected through the use of self-administered questionnaires from the post intern pharmacists of both hospitals. The questionnaire consists of five sections. Section A: captured demographic characteristics, years of experience in hospital practice, previous training in palliative care, as well as cadre/rank. Section B: contains 18-item questions to evaluate the general knowledge of the clinical pharmacist in palliative care of cancer patients. Section C**:** evaluated opinion on relevant attitude-related statements toward palliative care. Section D contains item-statements that clarified the extent of involvement in some palliative care services in their respective practice site, while Section E: contains questions that explored possible factors that may hinder involvement in palliative care. All data collected were analyzed using the statistical package for social science (SPSS 21).

Results: The association between pharmacists hospital of practice and attitude related statements showed a statistically significant difference of $p< 0.05$; indicating that there is no relationship between the hospital of practice of the pharmacists and their attitude towards palliative care of cancer patients. However, 78.9% of the pharmacists had inadequate general knowledge of palliative care, with almost two-thirds who had a misconception that medication therapy is the cornerstone of all symptom control in palliative care. More than 90% identified the goals of palliative care to be consistent with the philosophy of pharmaceutical care, while all recognized the fact that pharmacists' involvement in palliative care may decrease the need for medical emergencies. Various barriers limiting pharmacist involvement in palliative care received a 100% response rate

Conclusion: clinical pharmacists in selected hospitals showed inadequate general knowledge, as well as negative attitude towards palliative care of cancer patients. Also, their involvement in core palliative care service is generally low, with pharmacists' unawareness of their need in palliative care constituting a major barrier.

CHAPTER ONE

LITERATURE REVIEW

1.0 BACKGROUND OF THE STUDY

The World Health Organization has released an updated definition of palliative care. "Palliative care is 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 by means of early identification and impeccable assessment and treatment of pain and other problems, physical, psychosocial and spiritual". (WHO, 2020). To address the stated physical, psychosocial and spiritual problems in this definition, a multidisciplinary treatment team is ultimately needed. Palliative care teams in hospitals and community health care have been established throughout the Western world. (Agora, 2018.). But, even though the successful incorporation of a pharmacist in such a team has been described already in 2018 many of these teams still do not include a pharmacist as a regular team member. (Soyannwo, 2019) In Nigeria, hospitals are reimbursed by health-insurance companies for providing palliative care, and approximately 75% of all hospitals now have a palliative care team (Rasaq *et.al*, 2020). However, as disease progresses, many patients prefer to spend their moments at home, in a hospice or in a palliative unit of a nursing home. Thus, first-line healthcare providers including the general practitioner, community pharmacy and district nurse, provide palliative care as well. Several previous studies have reported on the activities of pharmacists in palliative care teams. For inpatient teams, the first report came from Canada, where a pharmacist was consulted for each palliative patient requiring pain and symptom control, (Smith *et al*., 2019.). A second study in a specialized oncology clinic showed pharmacists' interventions after implementation of a regular pharmacist in the team on drug-interactions, duplicate therapies, management of side effects and

untreated conditions (Soyannwo, 2019). A third inpatient study identified an average of 3.5 pharmacist interventions per patient, with pain as the most common reason for consulting (Craig, 2018). The role of a pharmacist for ambulatory patients, who were still under the care of the hospital, has been studied in a small group of 11 patients, where 20 drug-related problems were identified. The acceptance of pharmacists' proposed interventions by the hospital doctors was high at 94%. (Fisher *et al.*, 2017). Similar positive results are seen in studies in hospice or palliative nursing home settings. In first-line palliative care teams, community pharmacists' contributions showed a high rate of interventions. The increasing number of people living with deadly Illness especially cancer is a worldwide health concern that may cause a paradigm change that has to do with the provision of palliative care service by all healthcare professionals despite their various sites of rendering services. the present estimate connotes that approximately 75% of people approaching the deadly pang may benefit from palliative care (Rasaq and Aderonke; 2018). With global and local evidence showing the impact of palliative care on patient outcomes, caregiver and healthcare. Palliative care is a patient- and family centered approach to care focusing on quality of life and relief of symptoms, thus, it is a necessitated discipline that needs extensive collaboration and teamwork among healthcare professionals, patients and caregivers. Studies have identified the palliative care population as one of the groups who are at the highest risk of medication issues and adverse effects, and consequently increased hospital admissions. Adam et al, 2019. reported that almost one-third of patients with cancer access out-of-hours primary medical care due to poorly controlled pain. In essence, patients requiring palliative care typically have deadly and high risk medication regimen such as opioids that require frequent adjustment and monitoring, thereby making the pharmacist a highly required member of palliative care team whose functions can Potentially increase the patient

medication management and reduce the risk of non-adherence. Published reports especially from developed countries have identified different roles played by pharmacists in palliative care with benefits and effectiveness of service offered in this context (Etkind *et al* 2017). However, in most developing countries, palliative care is still an emerging medical practice unit that requires healthcare providers' contribution and participation. In Nigeria for instance, palliative care is in its early stage of development with services mainly limited to patients who attend the tertiary hospitals, while pharmacists were recognized among the least considered member of the healthcare team providing palliative care service. In addition, the Benchmark for Minimum Academic Standard from the two major regulatory agencies for pharmacy education in Nigeria, that is the National Universities Commission and the Pharmacists Council of Nigeria does not include aspects on palliative care in the curriculum contents. This is in spite of the pharmacists' essential role in medication therapy management especially for patients with complex chronic regimen. Nevertheless, studies from developed countries have generally identified reasons for low involvement of pharmacists in palliative care to include inadequate knowledge and skills, deficient education and training in palliative care, as well as attitude and belief towards palliative care. In Nigeria however, there is dearth of evidence-based research that directly examine the extent of pharmacists' involvement in palliative care as well as barriers to participation. This study will carry out various exploratory functions to comprehensively evaluate knowledge, attitude and involvement of hospital pharmacists in tertiary healthcare institutions in Benin city, Edo state Nigeria in palliative care, while factors that may hinder their involvement in palliative care were also explored. The information that will be obtained from this study may help in identifying areas of focus for future advocacy and intervention to address the practice gaps.

1.1 PALIATIVE CARE OF CANCER PATIENTS

Since the very beginning, the focus of medicine has always been to relieve suffering and bring healing to those ailing from diseases. While modern medical practice has made major achievements with curative interventions for many of the communicable diseases, non-communicable diseases such as advanced cancer, chronic organ failure and degenerative disorders remain largely incurable. In these conditions, the focus of medical therapy is to prolong survival. However, it must be accepted that at some point, all people with chronic illnesses will eventually deteriorate and face the end of life. People with chronic life-threatening conditions frequently experience numerous problems throughout their illness. This includes distressing physical symptoms such as pain, breathlessness, nausea and disability. They may also experience psychological symptoms like depression and anxiety. Apart from this, there are many other social challenges that people with chronic illnesses face such as a lack of care and support in the community, financial catastrophes and family dysfunction. Last but not least, a chronic life-threatening condition often challenges an individual's spiritual wellbeing and problems such as demoralization and loss of meaning in life are also common issues. At present, the vast majority of these Nigerians who are suffering do so in silence as there is a great lack of awareness and understanding for the role of palliative care and the need to provide equitable access to palliative care services throughout the country. A global call to develop palliative care by the World Health Organization Worldwide it has been estimated that 60 million people are in need of palliative care annually and the vast majority of these people are living in under-developed and resource poor areas. Because of the magnitude of the need for palliative care worldwide. In 2014, the 67th World Health Assembly declared resolution WHA67.19 for the "Strengthening of palliative care as a component of comprehensive care throughout the life course". This resolution urges all

Member States: "to adopt, strengthen and implement, where appropriate, palliative care policies to increase the comprehensive strengthening of health systems to integrate evidence-based, cost-effective and equitable palliative care services in the continuum of care, across all levels, while focusing on the promotion of health systems at both urban and local levels and global heath improvements" For a comprehensive care of NCDs all people require access, without discrimination, to a nationally determined set of promotive, preventive, curative rehabilitative and palliative basic health services." In the 2015 United Nations General Assembly, world leaders designed the Sustainable Development Goals in which SDG target 3.8 refers to: "the means of increasing the global health systems which includes the economical protection and the overall access to improved health care services rendered to achieve a safe, effective and quality life. In other to achieve these objectives, the provision of improved palliative care is required as a major health intervention in other to achieve outmost output economic development. This is clearly stated in the definition of UHC by the WHO. "Universal health coverage ensures that various patients acquire major health services that are required of them. A clear example is the use of anti-tobacco information campaigns and taxes, to prevent illness such as vaccinations, and to ensure timely supply of treatment, rehabilitation and palliative care of sufficient quality to be effective, while at the same time ensuring that the use of these services does not expose the user to economic hardship. And unnecessary emotional and psychosocial burdens which are not needed in the patients." The provision of quality palliative care has major advantages. What are the major benefits of palliative care?

1. According to Adedetu, 2012. Studies showed that specialized palliative care in hospital based, community based, and home-based settings improved overall quality of life scores significantly in patients with life-threatening diseases including cancer,

chronic obstructive pulmonary disease (COPD), congestive heart failure (CHF) and dementia. It also reduced caregiver burden, improved coordination of care, reduced hospital admissions and allowed patients to die in their preferred place of death.

2. Physical well-being Palliative care interventions to address symptoms such as pain, dyspnea, nausea, vomiting and diarrhea have been found to significantly reduce these symptoms and improve physical wellbeing. Majority of these interventions include pharmacological management as well as palliative radiotherapy.
3. Psychosocial and spiritual well-being psychosocial interventions commonly used in the palliative care setting such as counseling, supportive therapy, cognitive behavioral therapy and psycho education are effective in improving QOL and emotional wellbeing of patients with advanced cancer. Interventions such as therapeutic life review and dignity therapy have also been shown to relieve existential and psychological distress in patients near the end of life.
4. Reducing costs of healthcare Health economic evaluations have also demonstrated that palliative care is cost saving. Patients receiving palliative care consultations had significantly lower hospital costs particularly if they had a diagnosis of cancer. Community based palliative care was also associated with reduced average in-patient hospital costs by about 7-10%. It was also associated with reduced acute admissions, bed days and healthcare costs in the last 1 year of life

Patient survival interestingly, studies have also shown that apart from providing better quality of life at lower overall costs, palliative care also has a significant impact on patient survival. In a randomized controlled trial (RCT) looking at the effects of early palliative care in advanced lung cancer patients, it was found that patients receiving palliative care plus standard oncology care

had significantly longer overall survival compared to those receiving standard oncology care alone.

the National Palliative Care Policy and Strategic Plan needed in Nigeria as a signatory to the world heath resolution and being a nation that truly cares for its people, Nigeria has increased significantly in the development of palliative care services in Nigeria. In Nigeria, palliative cares are approaching integration with mainstream medicine (World map of palliative care 2015). Nigeria also stands out significantly amongst many of its West African neighbors. However, in the 2015 Global Quality of Death Index published by the Economist Intelligence Unit, Nigeria ranked 38 out of 80 countries worldwide. (GQD,2015). This is because Nigeria is still in the developing stage of rendering equitable and effective palliative care services to meet the desperate needs of our population. Comprehensive palliative care services in hospitals and the community remain underdeveloped and seamless care delivery has not been achieved.. Availability of essential drugs is also still a problem and human resource are markedly lacking in this field, which is not yet popular among young doctors and nurses. Palliative care has been developing over the past 27 years in Nigeria and has established a solid foundation for further development. This is an opportunity to move forward, expand care provision and reach out in a most meaningful manner. We are at the cusp of fully integrating palliative care into our healthcare system and it is hoped that by the year 2030, Nigeria will be able to truly achieve including palliative care for the nation.

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1.2 THE ROLE OF PHARMACISTS IN PALIATIVE CARE OF CANCER PATIENTS

Palliative care is a relatively modern concept, and the role of each health professional in the palliative care team is still being established. However, the strengths of pharmacists, such as access to and knowledge of medications, Should be utilized in the care team. This should be complemented by the involvement of other health professional with unique skill sets. Cancer is the leading cause of death in Nigeria with increasing incidence and mortality, and is a major public health problem (Nelson, 2017). In oncological population, pain remains a common and distressing symptom, affecting approximately 59% of patients undergoing anticancer treatment, 64% of patients with advanced/metastatic cancer, and 33% of patients having completed curative treatment.

According to Dr. Schwartz 2019, Pharmacist can manage drug interactions in cancer patients by been aware of both the potential and acute drug interactions in the patient medications.

The guidelines for the management of cancer pain were developed by the World Health Organization (WHO) in 1986 and revised in 2020, but there is substantial evidence that the management of cancer pain is still often sub-optimal. Barriers to adequate pain management include societal attitudes toward pain management, system and regulatory barriers, clinician barriers, patient barriers, as well as socioeconomic disparities in the assessment and management of pain. One of the most pervasive barriers in clinician is inadequate provider knowledge regarding pain management. (Smith, 2018). A survey in West Africa using Nigeria as case study showed that medical school/residency training with regard to cancer pain management was inadequate in 80% of physicians, because of little formal time for pain management education throughout their Training and career (Gilbar *et al*, 2020). With regard to patient-related barriers, worry about side effects, fear of addiction and reluctance to report pain are primary ones. For

above reasons, it is essential to shed light on a new model of management to improve cancer pain pharmacotherapy for Nigeria population. Of late years, clinical pharmacists (CPs) play an increasingly important role in pharmacotherapy management in Nigeria. Clinical pharmacist have carried out a lot of clinical pharmacy services to promote rational use of medicines in cancer pain patients by comprehensively evaluating cancer pain, giving suggestions on drug treatment to physicians, and conducting pharmaceutical education to patients. According to a West African study, participation by the pharmacist in the cancer pain multidisciplinary management team led to a marked reduction in most of the drug-related problems (DRPs) and a statistically significant change in pain score.(Shipman,2017). Moreover, Zhai *et al*., 2018. Suggested that detecting and correcting DRPs by Clinical pharmacists brought about positive effects in reducing mortality in patients with acute myocardial infarction, while this pattern has not been evaluated in patients with cancer pain. Thus, this research project will explore the role of clinical in cancer pain patients based on a model of clinical pharmacy services.

This study aims to explore how pharmacists contribute to palliative care settings in Nigeria.

1.4 EXPANDING THE ROLE OF THE ONCOLOGY PHARMACIST

Palliative care services is a health approach in other to increase the total well being of the individual in terms of physical, social, and psychological problems that are encountered by patients near death end. (Pitizen, 2019). The care rendered during the final few days, weeks or months of life is broadly referred to as near death end care. The chief care in the community is a major problem in providing the needed death end care; the gold standards framework can be used to optimize non-specialist care for patients nearing the end of life.

(Savage *et al*, 2018). The care pathway for the dying patient can be used to support the increased level of care needed in the final days and hours of life. Specialist palliative care pharmacists can tailor treatment to suit individual needs, while considering the patients' needs to getting a wholly healthy condition. (Nelson *et al* 2018). It also renders a holistic freedom from pain and other complicating signs that may increase the un needed rate of near death end.. 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 own bereavement Uses a team approach to address the requirement of patients and their families, including bereavement counseling This will ultimately improve the overall quality of life and also increase the life span of the patients. General palliative care is important for the patients and also the family members in other to eradicate the complicating death menace. for example, those patients with stable disease whose symptoms are not changing and those with unstable disease, multiple co morbidities, uncontrolled symptoms or psychological damages and this are usually delivered by health professionals. These can be delivered in a hospital or in homes, depending on where they prefer to receive care. Initially, nurses and doctors have been the main professionals involved in palliative care. Yet different health professionals are essential when caring for patients facing deadly illness. Pharmacists, allied healthcare professionals, family support and healthcare assistants are among the professions involved in the provision of effective palliative care. (Needhams *et al,* 2017). Specialist clinical pharmacist working in palliative care can be based in a number of settings, usually hospice, and hospital or community pharmacy. Roles vary

and can range from supplying specialist palliative care drugs to providing a full clinical service as part of a specialist palliative care team. At John Taylor Hospice, Birmingham, clinical pharmacist form part of a multidisciplinary team that works primarily in the community visiting patients and families in their preferred place of care (usually at home). Patients referred to a clinical pharmacist will have a range of needs and issues, some of which are described below.

Medication review and medicines reconciliation: Patients who benefit the most from medication review tend to be those with multiple co morbidities who are taking complex drug regimens. Such patients are often managed by a number of different specialists in different areas, without an overarching plan. Medication review is an opportunity to rationalize patients' medicines and have open discussions with patients, and with cares about how they take their medicines and their concerns. Medicines reconciliation is useful in ensuring discrepancies introduced before and after hospital admission is resolved. Performing this in patients' homes allows more comprehensive assessments to be completed. Adherence issues can be addressed and information given to empower patients to be involved in their care. Complex symptom control Patients who respond poorly to conventional first- and second-line therapies, or who have experienced side effects, are often referred to a pharmacist. He or she will take a full clinical history, including the patient's symptoms, treatments tried, doses used and response to these. Based on this information the pharmacist would then consider all the options available for symptom management which could include trying a third-line drug, maximizing doses of current medicines, using combination therapy, arranging admission to a hospice, referral to an oncology team (for example to consider palliative radiotherapy), Impaired drug metabolism or clearance Patients with impaired renal or liver function are commonly referred to a specialist pharmacist. Involvement can range from advice on drug doses to selection of specialist medicines, particularly at the end of life.

Drug administration difficulties Swallowing difficulties are often experienced by patients at the end of life, but can occur earlier in those with head and neck cancer and some neurological conditions. Providing advice on drug choice, formulation and rationalization of medicines is part of the pharmacist's role. Understanding different feeding tubes and routes of administration is a key element.

Use of specialist palliative care drugs there are certain specialist palliative care drugs that are not used routinely in the community (for example ketamine, methadone, methylnaltrexone). The clinical pharmacist should have input into decisions to use such medicines, and be involved in monitoring and ensuring safe, ongoing supplies. Patients with a non-cancer diagnosis are often referred to a palliative care pharmacist, since other professionals are less familiar with the medicines they are taking. Such patients include those with end-stage heart failure, renal failure, chronic obstructive pulmonary disease, motor neuron disease, liver failure, e.t.c.

Tailoring care Specialist palliative care pharmacists tailor treatment to suit individual patients, aiming for maximal benefit with minimal complications and always respecting personal views about medicines. Palliative care patients can be complex medically, socially and psychologically, so these factors need to be taken into consideration with any pharmaceutical intervention. It is also important to recognize that not all issues can be resolved and that it may be necessary for pharmacists to manage patient's or carer's expectations accordingly. (Jaranson *et al* 2018).

Advanced communication skills are a fundamental part of the role, since discussions about medicines can provoke strong reactions and difficult conversations about death and dying.

1.5 THE ROLE OF PHARMACIST DURING CANCER TREATMENT

A pharmacist is a professional health care provider who is qualified to fill prescription medications ordered by a doctor. They often provide information on how to take medications, potential drug interactions and tips on taking prescription medication on schedule. There are many kinds of pharmacists who work with people living with cancer during their treatment. One may familiar with community pharmacists, who work in local pharmacies to fill prescriptions. There are also pharmacists who work in hospitals, clinics and specialty pharmacies to provide the best care possible during treatment. (Ise *et al*, 2017). Regardless of the type of medicine that a doctor prescribes, pharmacists help by: Explaining how the medication works. The doctor or another member of the health care team may have reviewed the ins-and-outs of the medication when patient receive prescription, but hearing the information more than once is helpful especially during what can be a stressful time. If a patient is taking multiple medicines for different health problems, the pharmacist can also help them understand any potential medicine interactions that may be harmful or make the medicine less effective. Reinforcing how the medication is to be taken. For example, some medications should be taken with meals; others should be taken on an empty stomach. If the medication is self-administered via an injection, the pharmacist can explain the proper injection technique. Reviewing what side effects might occur. This information is provided in the "package insert" (PI) that accompanies the medication, but it can be valuable to hear it explained in everyday language. (Ingleton, 2018). The pharmacist can also monitor any side effects that the patient may experience, and offer guidance (in collaboration with other health care team) on possible ways to relieve the symptoms, the side effects it may cause. Explaining insurance covers. An insurer may require that a generic (or bio similar) version of the drug be dispensed, if one exists. (Hill, 2017). Pharmacist can help

determine if this is the case and explain any differences between the original drug and the covered drug, including any out of-pocket cost implications. Recommending financial resources. There are a number of financial aid organizations and patient assistance programs available to help patients with their out-of-pocket expenses. The pharmacist can be a good source of information about these resources.

Taking medication on schedule is known as adherence. Adherence is key to getting the best result possible from patient treatment. This is especially important if patient is taking a pill for cancer treatment. (Gibbs *et al* 2017). Unlike the cancer medicines given at your doctor's office, pills and other medicines put patient or caregiver in charge of treatment. This means you are responsible for remembering to take your medicine as prescribed and on schedule. How does adherence affect the results of cancer treatment? If a patient is taking pills or administering self-injections, how one takes or administers these medicines is important. These types of medicines release the active ingredient over a set period of time to keep a steady amount of medicine in the body. When a dose is skipped, the level of medicine is lowered and this can reduce the medicine's success at treating the cancer. On the other hand, if one takes doses too close together one may get too much of the medicine in his/her body. This extra medicine can lead to more side effects, which could be dangerous. For these reasons, it's very important to follow the instructions for taking medicines. (Hansen 2017). It is also important to take medicines prescribed for side effects as directed. This will ensure that the medicines are working their best to help with the symptoms they were prescribed for. If one is ever unsure of how to take a medicine, patient should not hesitate to contact the pharmacist or someone on your medical team.

1.6 CLINICAL PRACTICE GUILDLINES FOR QUALITY PALIATIVE CARE

Clinical Practice Guidelines for Palliative Care Excellence in specialist-level palliative care requires expertise in the clinical management of problems in multiple domains, supported by a programmatic infrastructure that furthers the goals of care and supports practitioners. In 2004, The National Consensus Project identified eight domains as the framework for these guidelines: Structure and Processes; Physical Aspects of Care; Psychological and Psychiatric Aspects of Care; Social Aspects of Care; Spiritual, Religious, and Existential Aspects of Care; Cultural Aspects of Care; Care of the imminently Dying Patient; and Ethical and Legal Aspects of Care. (Forbes, 2017). The guidelines rest on fundamental processes that cross all domains and encompass assessment, information sharing, decision making, care planning, and care delivery. Each domain is followed by specific clinical practice guidelines regarding professional behavior and service delivery. These are followed by justifications, supporting and clarifying statements, and suggested criteria for assessing whether or not the identified expectation has been met. References to the literature supporting these recommendations are included in the guidelines. In addition, there are case examples to illustrate the operationalization of the domains into practice. I also conducted a variety of literature searches in Medline and the Cochrane Collaboration and reviewed many articles. (Craig, 2018). Where experimental evidence of good quality care exists, it is cited. Other citations reflect the expert opinion of consensus efforts, professional organizations, and experts in the field.

1.6.1 CLINICAL PRACTICE GUIDELINES FOR QUALITY PALLIATIVE CARE

1.6.1.0 **Structure and Processes of Care Guideline**

According to Agora *et al*, 2011, the timely plan of care is based on a comprehensive interdisciplinary assessment of the patient and family. Criteria:

1. Assessment and its documentation are interdisciplinary and coordinated. Initial and subsequent comprehensive assessments are carried out through patient and family interviews, review of medical records, discussion with other providers, physical examination and assessment, and relevant laboratory and/or diagnostic tests or procedures. The consultative evaluation should include the patient's current medical status, adequacy of diagnosis and treatment consistent with review of past history, diagnosis and treatment, and responses to past treatments.
2. Assessment includes documentation of disease status, including diagnoses and prognosis; comorbid medical and psychiatric disorders; physical and psychological symptoms; functional status; social, cultural, spiritual, and advance care planning concerns and preferences, including appropriateness of referral to hospice. Assessment of children must be conducted with consideration of age and stage of neurocognitive development.
3. Patient and family expectations, goals for care and for living, understanding of the disease and prognosis, as well as preferences for the type and site of care, are assessed and documented. The assessment is reviewed on a regular basis. The care plan is based on the identified and expressed preferences, values, goals, and needs of the patient and family and is developed with professional guidance and support for decision making. Criteria. The care plan is based upon an ongoing assessment determined by goals set with patient and family and with consideration and discussion of the changing potential benefits and burdens of care

along with assessment at critical decision points during the course of illness. Family is defined by the patient and may include relatives or friends. The care plan is developed with the input of patient, family, caregivers, involved healthcare providers, and the palliative care team with the additional input, when indicated, of other specialists and caregivers, such as school professionals, clergy, friends, etc. Care plan changes are based on the evolving needs and preferences of the patient and family over time and recognize the complex, competing, and shifting priorities in goals of care. The interdisciplinary team coordinates and shares the information, provides support for decision making, develops and carries out the care plan, and communicates the palliative care plan to patient and family, to all involved health professionals, and to the responsible providers when patients transfer to different care settings.

4. Treatment and care setting alternatives are clearly documented and communicated and permit the patient and family to make informed choices. Treatment decisions are based on goals of care, assessment of risk and benefit, best evidence, and patient/family preferences. Reevaluation of treatment efficacy and patient-family preferences is documented. It is essential that the evolving care plan is documented over time. Agora et al, 2011. An interdisciplinary team provides services to the patient and family consistent with the care plan. In addition to nursing, medicine, and social work, other therapeutic disciplines with important assessment of patients and families include physical therapists, occupational therapists, speech and language pathologists, nutritionists, psychologists, chaplains, and nursing assistants. For pediatrics, this should include child-life specialists. Complementary and alternative therapies may be included. The team includes palliative care professionals with the appropriate patient-population-specific education, credentialing, and experience and

the ability to meet the physical, psychological, social, and spiritual needs of both patient and family. Of particular importance is hiring physicians, nurses, and social workers "appropriately trained" and ultimately certified in hospice and palliative care. Education should include a fundamental understanding of the domains of palliative care and the goals of the Medicare Hospice Benefit, in addition to pain, symptoms, grief, bereavement, and communication. Ideally this occurs in preceptor ships, fellowships, or in baccalaureate and graduate specific programs. Continuing education is an essential for professionals currently in practice.

5. The interdisciplinary palliative care team involved in the care of children, either as patients or as the children of adult patients, has expertise in the delivery of services for such children. The patient and family have access to palliative care expertise and staff 24 hours a day, seven days a week. Respite services are available for the families and caregivers of children or adults with life-threatening illnesses. The interdisciplinary team communicates regularly (at least weekly or more often as required by the clinical situation) to plan, review, and evaluate the care plan, with input from both the patient and family. The team meets regularly to discuss provision of quality care, including staffing, policies, and clinical practices. Team leadership has appropriate training, qualifications, and experience. Policies for prioritizing and responding to referrals in a timely manner are documented. Guideline. The use of appropriately trained and supervised volunteers within the interdisciplinary team is strongly encouraged.

6. If volunteers participate, policies and procedures are in place to ensure the necessary education of volunteers and to guide recruitment, screening (including background checks), training, work practices, support, supervision, and performance evaluation and to clarify the

responsibilities of the program to its volunteers. Volunteers are screened, educated, coordinated, and supervised by an appropriately educated and experienced professional team member. Support for education and training is available to the interdisciplinary team.

7. This education also should comply with federal and state licensure and credentialing regulations. In its commitment to quality assessment and performance improvement, the palliative care program develops, implements, and maintains an ongoing data driven process that reflects the complexity of the organization and focuses on palliative care outcomes.
8. Quality care must incorporate attention at all times to: Safety and the systems of care that reduce error. Timeliness care delivered to the right patient at the right time. Patient-centered care, based on the goals and preferences of the patient and the family and also be inclusive of the principles of family-centered care. Beneficial and/or effective care, demonstrably influencing important patient outcomes or processes of care linked to desirable outcomes. Equitable care that is available to all in need and all who could benefit. Efficient care designed to meet the actual needs of the patient so that it does not waste resources. A quality assessment and performance review is done across all the domains including organizational structure, education, team utilization, assessment and effectiveness of physical, psychological, psychiatric, social, spiritual, cultural, and ethical assessment and interventions. From this, the palliative care program establishes quality improvement policies and procedures. Quality improvement activities are routine, regular, reported, and are shown to Influence clinical practice. While the palliative care organization leadership is responsible for such programs, there are designated individuals who operate the quality assessment and performance improvement program. The clinical practices of palliative care programs reflect the integration and dissemination of research and evidence of quality process. Quality

improvement activities for clinical services are collaborative, interdisciplinary, and focused on meeting the identified needs of patients and their families. Patients, families, health professionals, and the community may provide input for evaluation of the program. The palliative care program recognizes the emotional impact on the palliative care team of providing care to patients with life-threatening illnesses and their families. Emotional support is available to staff and volunteers as appropriate Policies guide the support of staff and volunteers, including regular meetings for review and discussion of the impact and processes of providing palliative care. (18th national consensus project) Palliative care programs should have a relationship with one or more hospitals and other community resources to ensure continuity of the highest-quality palliative care across the illness trajectory. Palliative care programs must support and promote continuity of care across settings and throughout the trajectory of illness. As appropriate, patients and families are routinely informed about and offered referral to hospice and other community-based healthcare resources. Referring physicians and healthcare providers are routinely informed about the availability and benefits of hospital and other community resources for care for their patients and families as appropriate and indicated. Policies for formal written and verbal communication about all domains in the plan of care are established between the palliative care program, hospice programs, and other major community providers involved in the patients' care. Policies enable timely and effective sharing of information among teams while safeguarding privacy. Where possible, hospice and palliative care program staff routinely participate in each other's team meetings to promote regular professional communication, collaboration, and an integrated plan of care on behalf of patients and families. Palliative and hospital care programs, as well as other major community providers, routinely seek opportunities to

collaborate and work in partnership to promote increased access to quality palliative care across the continuum. The physical environment in which care is provided should meet the preferences, needs, and circumstances of the patient and family to the extent possible. When feasible, care is provided in the setting preferred by the patient and his or her family. When care is provided away from the patient's home, the care setting addresses safety and, as appropriate and feasible, flexible or open visiting hours, space for families to visit, rest, eat, or prepare meals and to meet with the palliative care team and other professionals, as well as privacy and other needs identified by the family. The setting should address the unique care needs of children as patients, family members, or visitors.

1.7 ROLE OF PHARMACIST IN OPTIMIZING THE USE OF ANTI CANCER DRUGS IN CLINICAL SETTING AND THE PHARMACOTHERAPY OF CANCER TREATMENT AND MANAGEMENT.

As an initial stage, the Joint Commission, which is the accreditation body for health care facilities in the US and for international institutions who seek US third party insurance reimbursements, outlined a process of seven critical steps that constitute safe and complete medication management: (Akram *et al*, 2017).

1) Selection

2) Procurement

3) Prescribing, dosing, and transcribing

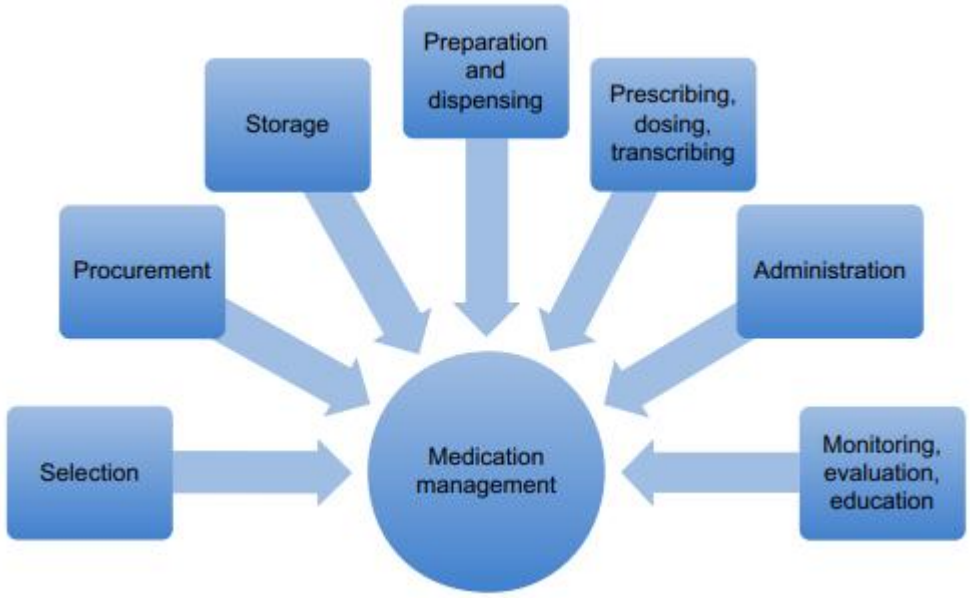
4) Storage

5) Preparing and dispensing (includes delivery)

6) Administering;

7) Monitoring, evaluation, and education.

Figure 1. Depicts the components of this process



Oncology pharmacist carries out the following drug-specific interventions

1. Adverse drug-reaction prevention and monitoring

2. Medication administration support, premedication, hydration

3. Addition of necessary medications

4. Discontinuation of drugs

5. Dose adjustments for organ dysfunction, weight, age

6. Therapeutic drug monitoring, Pharmacokinetic monitoring, Laboratory monitoring, Switch intravenous to by-mouth formulations, Writing prescriptions and refills.

7. Medication reconciliation and allergies, Patient education Assuring medication adherence.

Medication-management components are explained below.

Selection: Although selection could be confused with prescribing in some countries, the Joint Commission defines selection in this case as appropriate choice of a medication for a specific

indication. it can aid in the area of appropriate selection and provide medical information about antineoplastic pharmacology, dosing adjustments for organ dysfunction, and adverse-effect profiles. Drug-information skills specific to include the ability to utilize appropriate search engines and find published clinical trials and ongoing clinical trials, review study design, and evaluate evidence-based guidelines and appropriateness of biostatistics. Frequently asked questions of pharmacists may include requests to find the latest information on availability of an investigational anticancer drug and find updated information on recent developments. Additional information they may regularly access is literature that documents use of an anticancer drug for off-label use. This information can be particularly helpful to justify possible health insurance reimbursement.

Oncology pharmacist practice for supportive care, Hematology support, Anemia Colony-stimulating factor, Anticoagulation clinic, Chemotherapy administration follow-up Chemo protective agents protocol development, dosing Gastrointestinal side effect support Pain management opiates, side effect management, non-narcotic medications Infectious disease and antibiotic support Parenteral nutrition support Chronic disease medication management – hypertension, hyperlipidemia, cholesterol management, asthma control, diabetes control.

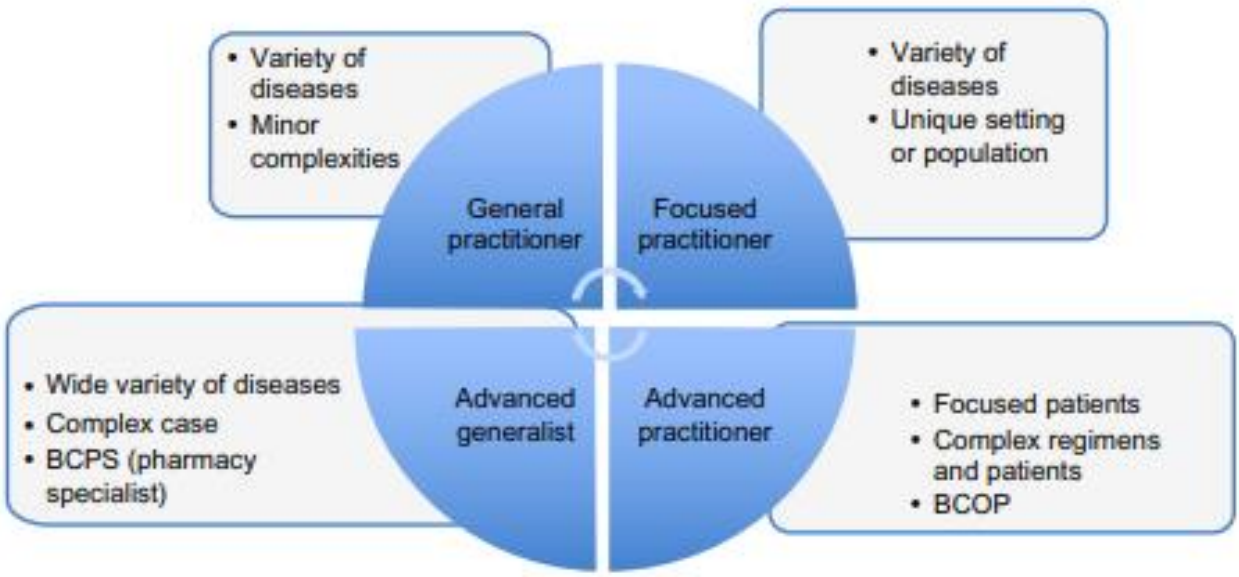


Figure 2 Range of pharmacist skills.

Previous stories that help to elucidate the patient's tolerance of current and previous medications and chemotherapy, and thus also adding to factors considered for selection. Obeche *et al* 2011. In recent years, some pharmacists have concentrated on pharmacogenomics, (Barbee *et al*, 2017). The study of genetic factors that contribute to determining drug response or toxicity. Genome variation for the tumor is due to acquired somatic mutations acquired through the evolution of a cancer. Differences in the tumor genome help to explain varying therapeutic responses to chemotherapy. Examples of this are seen in the selection of epidermal growth-factor receptor (EGFR) drugs like gefitinib, erlotinib, and cetuximab. Identification of somatic mutations in the tyrosine-kinase domain of the EGFR gene will correlate with response. Variations in the germ-line genome represents inter individual inherited genetic factors. With identification of genetic marker decisions for optimal drug selection, dose and treatment duration can be tailored to certain patients. Response to chemotherapy has been demonstrated to be a heritable trait dictated by the germ-line genome. Based upon pharmacogenetic testing, it can be involved with selection

of a drug that may have a likelihood of a higher response or if specific toxicity risks are higher for one drug over the other.

Prescribing, dosing, and transcribing

Pharmacists play a major role in the of prescribing and transcribing chemotherapy regimens. Prescribing or ordering is defined as the specific items in a prescription and the logistics of placing the medication order. Mistakes in prescriptions or in the prescribing process can lead to significant medication errors. General medication errors in hospitals generally range from 2% to 5%. Chemotherapy error rates have been reported at 3%–16%. Errors in ordering are most common, followed by administration and then dispensing. Missing or improperly written premedication orders prior to chemotherapy and missing treatment parameters could also lead to potentially serious adverse drug reactions. Several hospitals have taken initiatives to implement multidisciplinary failure modes and effects analysis (FMEA) in order to reduce improper dosing, incorrect dosing calculations, assure cumulative dose calculations, and implement checklists for incomplete nursing orders. Even with implementation of computerized physician order entry, the process of FMEA to accompany pharmaceutical care will add to safety measures. Pharmacists contribute significantly to the dosing portion of the prescribing process. Dosing in elderly and pediatric patients may require consideration of unique factors. Approximately 52% of cancer patients with newly diagnosed cancers are at least 65 years of age. a natural part of the aging process will affect drug-absorption, distribution, metabolism, and elimination changes. Changes in drug absorption result from decreased splanchnic blood flow and gastrointestinal motility and increased gastric pH. Cardiovascular and gastrointestinal medications can also affect these processes. Physiological changes, such as increase in body fat, decrease in body water and lean body mass, serum proteins, and hemoglobin concentration will affect drug distribution. Hepatic

drug-metabolizing enzymes in the cytochrome P450 (CYP) cascade show decreased activity with antineoplastic like the taxanes that undergo hepatic CYP isoenzyme metabolism. Any agent causing inhibition or competition with CYP3A would affect serum levels and increase the potential for toxicity. All these cases would benefit from an OPS assessment for dosage adjustment. Drug–drug and drug–disease interactions in the elderly may also complicate dosing. Elderly patients have an average of three comorbid conditions and an average of medications. Cardiovascular drugs are the most commonly prescribed medications. Paclitaxel and carboplatin were the most commonly used antineoplastic agents. In patients with this combination of medications, dosage adjustments were not made. (Ogumor *et al* 2012) Aging also affects drug excretion, since the glomerular filtration rate (GFR) decreases. Renally excreted agents like carboplatin will require dose adjustment in declining renal function, since 70% of the dose is eliminated in urine in the first 24 hours. The combination of decreased excretion and drug interactions in the elderly are also potential areas for complications. Common medications utilized in geriatric populations like cyclooxygenase-2 inhibitors may affect elimination of several medications in the antineoplastic category. Pediatric patients present unique challenges in dosing due to differences in drug disposition. Altered gastrointestinal function, such as pH, motility, and bile production, or enzyme activity will increase or decrease oral drug absorption. Pediatric populations are more vulnerable also from a pharmacokinetic standpoint. Decreased metabolic and renal clearances at birth require drug-dosage adjustments. However, rapid development of organs and tissues affects metabolism and clearance, thus affecting drug serum concentrations. Children of 1–10 years old have a larger volume of distribution and may have a higher dose/kg requirement. Highly lipid-soluble drugs may have a smaller volume of distribution with resulting higher serum concentrations from a specific dose. All these factors

may alter the dosing and require the expertise of a pediatric-trained oncology pharmacist. As children move through puberty, increased sex hormone production affects both CYP and conjugation metabolic pathways. Adolescent males have increased lean body mass and water, whereas women have increased body fat. These alterations in body composition affect drug distribution. BSA-to-mass ratio changes throughout childhood, with BSA increasing threefold while weight increases 5.5-fold between 2 and 18 years. (Morisson *et al* 2012). Questions are often posed to pharmacists in dosing chemotherapy for both the underweight and overweight patient. Actual body weight is used to calculate BSA for dosing or GFR. However, in the severely underweight patient, numerous alterations exist in drug disposition. Rate and extent of absorption as well as increase in free active drug due to decreased serum proteins may affect distribution. Metabolism and excretion are reduced. Protein and calorie malnutrition also affect a patient's sensitivity to chemotherapy, leading to decreased tumor response. In overweight patients, clinicians may hesitate to dose a patient at full body weight. Obesity is defined as 30%–40% over ideal body weight or above the 95th percentile for body mass index. However, reviews of drug disposition in obese patients suggest that serum protein binding, metabolism, and renal function remains unchanged, bringing into question the need for dosage adjustment. Alterations in obese patients' pharmacokinetic profiles include reduced clearance of doxorubicin and methylprednisolone that showed increased acute pharmacological effects. However, reduced clearance has not been correlated with differences in efficacy or toxicity. Pharmacogenomic studies have affected dosing in certain antineoplastics. With the discovery of the thiopurine methyltransferase allele in pediatric acute lymphoblastic leukemia patients, the US Food and Drug Administration (FDA) changed labeling for 6-mercaptopurine to require genetic testing to be performed to determine if a dose decrease is needed.. The FDA has also changed labeling to

recommend pharmacogenetic prescribing for irinotecan in patients with the UGT1A1 (uridine diphosphate glucuronosyltransferase 1 family, polypeptide A1) genetic variation, which may cause patients to suffer from more intense neutropenia or diarrhea. Patients with dihydropyrimidine dehydrogenase genetic variation may need dose adjustments due to increased risk for leucopenia and severe mucositis.

Procurement: Making a drug available to the patient in and of itself does not help to optimize anticancer therapy, but certainly procurement is a necessary step.. A record of 320 drug shortages in the US were reported in 2013. Most shortages occur in the injectable dosage form. The FDA indicates that quality issues, such as contamination (43%), are the most common issues, but other factors, such as manufacturing delays, plant closures, drug discontinuations, and increased demand, add to the shortage. Drug shortages can cause numerous complications. McBride et al 2013, described the most common shortages that occurred 12 months prior to a survey from 243 members of the Hematology/Oncology Pharmacy Association and other organizations. (Ahmed *et al* 2017). The most common shortages included leucovorin, liposomal doxorubicin, fluorouracil, and paclitaxel, which may affect patients with ovarian, breast, and colon cancer. In 93% of patients, shortages were reported to have delayed therapy or caused changes in therapy because patients were forced to travel to another institution, receive alternative medications, receive lower doses, or omit medications altogether. Increased cost was reported in 85% of patients. Reimbursement challenges related to drug shortages were reported in 10% of patients. Additional costs were also related to increased labor hours, with 1,000 extra hours reported in 34% of cases. These additional hours spent by pharmacists could be better spent in other areas. Changes in drug therapy due to drug shortages also caused a medication error rate of 6% and a near-miss error rate of 16%. Relapse in patients required additional

intensive therapy, leaving them at risk for infertility and other treatment-related health problems. ASHP routinely updates medications in shortage and includes the three drugs listed in McBride *et al*, 2013 as well as carboplatin, cytarabine, dacarbazine doxorubicin, fludarabine, lomustine capsules, mercaptopurine tablets, methotrexate injection and tablets, thiotepa, and vinblastine. On a daily basis, the OPS role must check on the availability of drugs in shortage and work with oncologists to modify upcoming regimens. Oral targeted therapy cost can cost more than US$40,000–$45,000 per patient. With this cost, many retail pharmacies may not be willing to expend the budget if they are not guaranteed reimbursement. Specialty pharmacies where OPSs work have become well versed in obtaining pre-authorizations and reimbursement for high-cost oral antineoplastics.

Storage: The proper storage of antineoplastic agents in proper lighting and temperature to maintain chemical integrity is crucial to ensure that antineoplastics maintain their full dose activity. More critical is the issue regarding lookalike/sound-alike (LA/SA) medications, improper storage, and how this may impact proper dispensing. Drugs such as vincristine and vinblastine, carboplatin and cisplatin, daunorubicin, doxorubicin, and idarubicin have long been on the Institute for Safe Medication Practices list of drugs with confusing names. The Joint Commission medication-management standard describes the LA/SA standard and details storage and dispensing standards to avoid medication errors. It cannot be assumed that antineoplastics are separately stored from other medications, especially in small hospital pharmacy departments or a satellite clinic pharmacy. Pharmacists and their support staff must store these LAs/SAs physically apart to ensure proper selection. Other methods to differentiate include special font and size on labeling and applying warning ancillary stickers on the final dispensed drug. Improper storage placement for antineoplastic agents and non-oncology LA/SA medications may

also lead to medication errors. For instance, paclitaxel may be confused with Paxil® (GSK, Philadelphia, PA, USA), an antidepressant, or Xenical® (Hoffman-LaRoche, Nutley, NJ, USA) (orlistat), a compound prescribed for weight loss, can be confused with XELODA® (Genentech Inc., South San Francisco, CA, USA) (capecitabine).

Preparation and dispensing

The Reconstitution and preparation of anticancer drugs can be a complex process. Pharmacist-prepared and Pharmacy and Therapeutics Committee-approved standardized charts for dilution quantity, type of carrier solutions and volumes, specific containers (glass, low polyvinyl chloride, and plastic), infusion rates, and expiration dates will help with accurate compounding or preparation. Compounding worksheets that document each cycle of chemotherapy brand used, serial numbers (in case of recall), calculating cumulative doses of certain drugs, cycle number of chemotherapy and dates, along with space for technicians and pharmacists to double-check help to record a patient's course of therapy over time. OPSs can evaluate the use of closed-system transfer devices like PhaSeal® (Becton Dickinson, Franklin Lakes, NJ, USA) or ChemoClave® (ChemoClave Hospira, Inc., Lake Forest, IL, USA) may help to prime the chemotherapy safely for use by the administrator. OPSs are also responsible for making sure that multiple chemotherapy agents are not placed into biological safety cabinets simultaneously, so as to avoid injection of the wrong drug into the carrier solution. Preparation areas in outpatient, inpatient, and satellite pharmacy spaces may be small and not allow for appropriate ventilation. OPSs should have a role in assuring facility compliance with regulatory standards for biological safety, such as for vertical hoods or safety cabinets. This ensures safety for the technician and pharmacist, and also assures a sterile product. For research protocols, the OPS, nurse study coordinator, and investigational new drug pharmacist can work together to share information on

compounding of medications, since there can be limited data on stability, precipitation, and administration. The pharmacist's role in dispensing is to assure that the final drug product is legally labeled and contains all ancillary notification either on the label or stickers for administration, storage, and destruction. Examples include "Hazardous drug", "Refrigerate", or "Return to pharmacy for destruction". Dispensing also includes appropriate delivery, and OPSs are key in outlining policies and procedures for appropriate transport. For instance, fragile and costly biologicals should not be transported in tube-delivery systems to avoid destruction of the fragile protein carriers and thus negation of drug efficacy. OPS expertise is critical in creating policies and procedures that detail containment in spills or leak situations and ensuring proper disposal of IV, oral or topical dosage forms.

Administration

Administration of drugs remains a nursing mainstay, especially for parenteral drugs. Nurses often ask for information on compatibilities with multiple infusion lines, scheduling and sequencing, infusion rates, volume issues to prime IV lines properly, manipulating concentrations in fluid restriction, or even changing the type of carrier solutions in cases of metabolic abnormalities. In cases of delayed infusion time or delay in delivery, discussion on infusion rates to make up infusion time needs to occur, especially where short time frames are given for drug stability. Discussion on viable IV access, whether via centrally placed infusion catheters as opposed to peripherally placed lines, may help to avoid extravasation, especially in cases of past extravasation. Providing supportive care in cases of extravasation antidotes and protocols is also a vital role for the OPS. Dispensing and administration errors involving parenteral medications in pediatric populations can cause devastating outcomes. Due to the small volume of IV vincristine and the IV push administration, inadvertent intrathecal administration

of vincristine was first reported in 1968. Intrathecal administration of vincristine can cause acute central neurotoxicity and lethal outcomes. From 1968 to 2006, cases of inadvertent intrathecal administration have been reported worldwide. Physician/nurse and pharmacy error occurred in 69% of cases, pharmacy error 19%, and physician/nurse error 12%. In cases where all three disciplines were involved, inadequate communication was cited as the most common cause. In pharmacy-only errors, mislabeling of syringes was the main cause. Physician and nurse failures occurred due to lack of checking of labeling or to check physician orders. In 2005, The Joint Commission released a "sentinel event alert" in order to prevent vincristine administration errors. Standards detail steps to avoid past mistakes. More recently vincristine has been prepared in IV piggyback so that volumes will prohibit intrathecal administration. Nurses and OPSs must work together to prepare a patient properly to receive chemotherapy. OPSs can prepare orders for rehydration and forced-diuresis protocols in high-dose chemotherapy regimens. Suggestions to utilize such chemoprotective agents as high-dose ifosfamide with mesna, amifostine, and dexrazoxane are often made by pharmacists with regard to appropriate dosing, administration times, and sequence. OPSs can assure that protective steroid eye drops are ordered to protect against conjunctivitis caused by high-dose cytarabine. Infusion of monoclonal antibody drugs, such as rituximab and trastuzumab, may require prophylaxis with such medications as corticosteroids, antihistamine, and acetaminophen to avoid anaphylactic or allergic reactions. Administration preparedness also includes prophylaxis in supportive care areas, such as preventing nausea and vomiting. Historic use of the dopamine antagonists metoclopramide and prochlorperazine utilized the skills of the pharmacist for prophylaxis against extra pyramidal side effects. With the advent of the 5-HT3 -antagonist class of antiemetic, OPSs collaborate with physicians to establish prophylaxis protocols that match levels of regimen emetogenicity. OPSs

have shown that algorithms and treatment guidelines have shown cost reductions and improved control of chemotherapy-induced nausea and vomiting (CINV). Most recent reports show how pharmacist interventions help to reduce costs of antiemetics by 16% in outpatient clinics. The release of such neurokinin-1 receptor antagonists as aprepitant adds to the CINV regimens, especially in patients receiving multiday chemotherapy and cisplatin therapy. The correct utilization of aprepitant has been demonstrated in solid and hematological tumors, for transplant by pharmacists as a supportive regimen. In delayed CINV, clinicians tend to overprescribe aprepitant and serotonin antagonists and underprescribe corticosteroids. Physicians also tend to underprescribe antiemetics in patients receiving low-emetogenic-potential regimens. OPSs can help to choose correct medications other than the serotonin-receptor antagonists based upon protocols agreed upon between oncologists and OPSs. Administration challenges also occur with oral dosage forms. The placement of OPSs in inpatient and outpatient care areas and into specialty pharmacies has increased their role in administration. The US National Cancer Institute reports that 25% of the 400 antineoplastic agents in the FDA pipeline are planned to be oral medications.

Drug	Trade name	Antigen target	Indication
Monoclonal antibody			
Alemtuzumab	Campath	CD52	B-cell CLL
Bevacizumab	Avastin	VEGF	MM
Bortezomib	Velcade	NF-κB	MCR
Cetuximab	Erbitux	EGFR	MCR
Denosumab	Xgeva	RANKL	GCT
Dabrafenib	Tafinlar	BRAF	MM
Gemtuzumab ozogamicin	Mylotarg	CD33	AML
Ipilimumab	Yervoy	CTLA4	MCR
Ibritumomab tiuxetan	Zevalin	CD20	MM
Panitumumab	Vectibix	CD20	NHL
Pertuzumab	Perjeta	HER2	BCA
Ponatinib	Iclusig	BCR-ABL	CLL
Rituximab	Rituxan	EGFR	NHL, CLL
Tositumomab	Bexxar	CD20	NHL
Trametinib	Mekinist	MEK1 and 2	MM
Trastuzumab	Herceptin	HER2	MBC
Ofatumumab	Arzerra	CD20	CLL
Tyrosine-kinase inhibitors			
Afatinib	Gilotrif	EGFR, HER2, HER4	NSCLC
Bosutinib	Bosulif	Bcr-Abl	CML
Erlotinib	Tarceva	EGFR	NSCLC
Gefitinib	Iressa	EGFR	NSCLC
Imatinib	Gleevec	Bcr-Abl	CML
Multikinase inhibitors			
Cabozantinib	Cometriq	VEGF, RET	MTC
Sorafenib	Nexavar	VEGFR, PDGFR	HCC, RCC
Sunitinib	Sutent	VEGFR, KIT	RCC, GIST, pNET
Pazopanib	Votrient	TKI	Kidney, STC
Regorafenib	Stivarga	VEGFR	CRC

Figure 3: drugs used in the pharmacotherapy of cancer treatment

Drug adherence, formerly known as drug compliance is the key issue. General rates of medication adherence vary from 20% to 100%. Assumptions are made that adherence is not an issue in oncology patients, since cancer is a life-threatening disease. In women receiving oral cyclophosphamide and prednisone for breast cancer, self-reported compliance rates of 57% were reported. Bonadonna and Valagussa established an association between missed chemotherapy doses and inferior disease-free survival. Several studies indicate that higher survival rates occur with patient concordance with oral chemotherapy regimens. In a curable hematological malignancy, a 44% compliance rate was measured via assay, even with patient education. Additional issues arise with prolonged or long-term oral therapy. (Abdullahi, 2019). A patient's

perception of risks associated with disease, benefits from therapy, and the nature and severity of side effects affects long-term adherence. Social and psychological factors, such as social support, financial resources, complexity of treatment, and the patient's general belief about health and wellness warrant consideration. Pharmacists can employ various tools, such as a diary, to help with patient adherence and confirm adherence with pill counts and verification with refill histories. Patients must understand the importance of communicating missed.

Monitoring and evaluation

The last major medication-management process of monitoring and evaluating drug therapy has long been an area that OPSs have helped in to optimize anticancer drug therapy. By joining clinical rounds and suggesting clinical interventions at the bedside, the OPSs can effect faster change. As mentioned in the "Prescribing, dosing, and transcribing" section, medication errors may also cause adverse drug reactions. Pharmacists and nurses have demonstrated the ability to respectively avert potential adverse drug reactions by 50% and 40%. Occasionally even the patient may play a role in circumventing adverse drug reactions. During chemotherapy administration, the OPS can monitor the patient's ability to tolerate hydration regimens, electrolyte abnormalities, possible tumor lysis syndrome, control of nausea, vomiting, and other acute side effects via patient interview and routine monitoring of chemicals and vital signs. OPSs on patient-care floors or in IV compounding areas in pharmacies can chart or log cumulative doses for drugs like anthracycline for cardiac toxicity, with recommendations for multigated acquisition scan (MUGA), the nuclear image test that measures ejection fraction or perform pulmonary function tests for such pulmonary toxic drugs as bleomycin. Gastrointestinal toxicities, such as diarrhea and mucositis, can be prevalent with antineoplastic antimetabolites like fluorouracil and irinotecan. All grades of diarrhea have been reported as high as 82%. OPSs

can help with creating protocols to prevent or treat irinotecan-induced diarrhea with practice guidelines for assessment, dietary management, and pharmacological management with loperamide, octreotide, and antibiotics when necessary. Mucositis occurs alongside neutropenia, and OPSs can help with ordering prophylaxis or prompt ordering of various mouth rinses or local anesthetics to promote good oral hygiene by minimizing oral fungal infection and helping to minimize pain. Patients may need IV support or nutritional support during or between cycles of chemotherapy, due to nausea/vomiting, prolonged mucositis, enteritis, diarrhea, significant weight loss, cancer cachexia, and dysgeusia. Multidisciplinary care teams rely on pharmacists for a comprehensive initial assessment. Weight loss may be a diagnostic factor in certain cancers, and cachexia is a hallmark of cancer patients, exhibited by early satiety, weight loss, and asthenia. Poor nutrition can impact the patient's ability to tolerate recommended doses of chemotherapy and ability to recover from chemotherapy side effects. It is essential for the health care team to utilize the OPS to maximize the nutrition status of the patient in order for optimum antineoplastic dose administration. Working with dietitians to maintain adequate nitrogen balance and any issues of substrate metabolism, such as hyperglycemia, lipid metabolism, and maintaining a neutral or positive nitrogen balance, requires a team effort from pharmacist, dietitian and nurses. (Peter *et al*, 2013) Common side effects of chemotherapy are hematological, such as anemia, thrombocytopenia, and neutropenia. OPSs can monitor absolute neutrophil counts and platelet and hemoglobin levels to assure blood parameters are within acceptable limits for the next cycle of chemotherapy. Pharmacists have played a key role in antibiotic selection, dosing, and pharmacokinetic monitoring, especially in the case of the febrile neutropenic patient. Interventions have demonstrated a shortened number of total days due to focused attention by pharmacists. Studies have demonstrated before and after effects from pharmacist-led antibiotic-

stewardship programs. Significant decline in usage rates for inappropriate antibiotic use have been demonstrated, as well as for average duration of therapy. In the absence of pharmacists from the stewardship team, Clostridium difficile infection increased more than three fold. OPS assessment and evaluation of a patient's ability to tolerate oral medications and diet can expedite the conversion of IV antibiotics to the oral formulation, especially in patients where high-risk neutropenia is downgraded with fever defervescence, neutrophil recovery, and resolution of mucositis. As mentioned earlier, genetic variation in UGT1A1 is associated with irinotecan-induced neutropenia. Pharmacist monitoring of these patients would help avert potential infectious complications. The majority of US states allow pharmacists to administer vaccinations. OPSs can interview patients before initiation of chemotherapy to assess the need for influenza, diphtheria, tetanus, and pneumococcal vaccines. Patient education for medication compliance and finishing complete courses of antibiotic therapy to decrease resistance patterns is also key for pharmacists. OPSs can be very active in managing dermatological or cutaneous adverse effects caused by chemotherapy. Creating and updating extravasation protocols and guidelines is one of the first duties of any OPS. Other dermatological issues can range from skin changes, such as nail reactions hyper pigmentation, photosensitivity, rashes, and limb/ palmar–plantar erythematous reactions. In the taxane class of drugs, grade 3 toxicity can occur in 19% of patients. Pharmacists can provide a systematic approach to managing cutaneous reactions with utilization of warm or cold compresses, topical and/or systemic antibiotics and topical and/ or systemic corticosteroids. In general, OPSs can play a vital role in monitoring and evaluating drug therapy. Broad field described a rating sheet for four common toxicities – nausea, vomiting, diarrhea, and stomatitis that was administered to patients by oncology nurses. Patients rated their toxicity on the day of chemotherapy, and blood work was documented. Pharmacists in the clinic

would utilize these ratings to validate appropriate timing for dispensing of medications and also solve any necessary interventions. This helped to minimize waiting time for patients as well. A second phase of their program for toxicity monitoring included development of agent-specific toxicity scales. Toxicity profiles were described with recommendations for clinical monitoring. The standardized format ensured that key toxicities were addressed, and any toxicity could be extracted for outcome indicators. Protocols and standardized order forms help by having a recognizable framework to improve outcomes, minimize adverse effects, and provide patient education.

Patient education

Patient education is an essential tool used to empower the patient in their own care, and educated patients have also played a role in catching medication errors themselves, especially if receiving repeated cycles. Patients have detected omitted pre medications, wrong infusion intervals, leaking infusions, and incorrect doses, especially of oral medications. In an outpatient setting, OPSs can counsel new chemotherapy patients with a review of all the patient's medications, including prescriptions, over-the-counter, vitamins, alternative therapy, and herbal products, for drug chemotherapy interactions, drug–drug interactions, duplicate therapy, and potential side effects. Counseling services can also include patient expectations at clinic visits, education on adverse effects, compliance with supportive care medications, and any lifestyle modifications, such as contraception, diet, and fall-prevention precautions. Patient education is paramount to support successful oral treatment. Oncology pharmacists in ambulatory care settings and specialty retail pharmacies can play a prime role to help reduce outpatient and inpatient hospital visits and decrease administration and home-care costs. Acute therapy issues, such as adverse effects and complex dosing regimens, and administration issues, such as taking drugs with or

without food, will affect absorption and thus efficacy. Whether or not a capsule can be taken apart or contents dissolved, or if a tablet like gefitinib can be crushed is imperative information for patients who have difficulty swallowing. Patients may also need education on proper handling and storage of oral agents. Medication-information sheets, non-absorbable gloves, and hazardous waste disposal containers should accompany an outpatient oral chemotherapy prescription. Patients should be advised to avoid crushing or manipulating the dosage form without consulting an oncology pharmacist. Patient caregivers in the home or other nontraditional settings, such as long-term care facilities, should transfer the medication from the prescription container directly into the medication cup. Accidentally dropping a pill or capsule would require gloves or a paper towel to retrieve before being disposed of in a hazardous waste receptacle. Oral agents have added side effect profiles to the usual side effect profile. Palmar–plantar erythrodysesthesia syndrome can include acral erythema, hand–foot syndrome, and hand–foot skin reactions, and can occur with such multikinase inhibitors as sorafenib and sunitinib. Epidermal growth-factor receptor tyrosine-kinase inhibitors have a 75%–90% incidence of papulopustular rash and maculopapular acneiform rash. The incidence increases when these drugs are concomitantly administered with a monoclonal antibody. Hand–foot syndrome can occur with capecitabine, a side effect that can progress to blistering and desquamation. Skincare education, such as decreasing exposure to hot water, friction, and trauma in early therapy, avoidance of tight fitting shoes, and rigorous exercise are helpful prevention tactics, as are moisturizing with appropriate pressure in grade 0 and educating patients on application of creams and gels if these rashes progress to grades of 1–3. Rereleased medications like thalidomide are available through restricted-access programs to avoid the repeat mishaps of birth defects and fetal death. Pharmacist intervention is required in assuring proper contraception,

especially since thalidomide is present in semen. Pharmacists can clarify hormonal versus non hormonal contraception choices depending upon the tumor type, and advise patients not to donate blood or sperm during therapy and for 4 weeks after cessation of therapy. The establishment of a pharmacist-developed anticoagulation clinic and the importance of education has been documented. Pharmacists and pharmacy technician-led education programs in breast cancer clinics have demonstrated better patient understanding of chemotherapy support medications and led to significant dose reductions, reductions in the number of chemotherapy delays, and the amount of repeat dispensing of chemotherapy support medications. The link between thrombosis and malignancy is well documented in cancer patients who have concomitant venous thromboembolism, having increased mortality over non cancer patients. Cancer patients also experience increased complications and recurrence with chronic anticoagulation with warfarin. The use of chemotherapy is a known risk factor for the development of venous thromboembolism. Certain chemotherapy agents, such as fluorouracil and capecitabine, are known to interact specifically with warfarin. Endocrine therapy, mainly tamoxifen, has been associated with an increased risk of thrombosis. In a review of over 5,000 breast cancer patients seen in pharmacist-managed anticoagulation services demonstrated, 65.6% of patients were within therapeutic range as opposed to 56.7% of patients who were not seen by pharmacists. The incidence of major bleeds in this study was 2.1%, similar to non-oncology patients entered in randomized trials (0.9%–1.8%). Other trials in oncology patients have reported major bleeds at 12%–13%. In a survey performed by McKee et al 2012 of patients in outpatient settings, 86% felt it was “absolutely necessary” to discuss their initial treatment with a pharmacist, and 76% of surveyed patients requested pharmacy follow-up at future visits. Patients

were willing to pay for pharmacy counseling services (83%), with 28.9% willing to pay between USD$10 and $20 and 19.7% willing to spend more than $20 on pharmacy services.

Vital member of the interdisciplinary team as members of interdisciplinary team members, oncology pharmacy specialists offer a variety of services related to the seven processes of medication management, such as procurement and storage, and contributing to selection, prescribing, dosing, monitoring, evaluation and education.

Pharmaceutical care can take the form of improving management of supportive care, enhancing patient education, improving efficiency in the chemotherapy infusion center, and creating disease-specific treatment guidelines. OPSs contribute heavily to ensuring the safety of antineoplastic medications in order for them to be utilized to their fullest therapeutic potential. Involvement in gathering and follow-up of patient specific information and treatment adds strength to assessment and prioritization of care. In many US states and other countries, OPSs can enter into collaborative practice agreements to help manage drug therapy of patients under physician supervision. These types of practices can occur in hospitals, ambulatory care centers, and specialty pharmacies, and can range from the traditional dispensing of drugs to an independent role of running support-care clinics for managing side effects.

1.8 RATIONAL/JUSTIFICATION OF STUDY

Palliative care has been known to be a part of clinical care that has become necessary for patients that are well deserving of it. However, it has become interesting in investigating the extent to which clinical pharmacists have contributed to palliative care settings in Nigeria. The initial focus was on the use of morphine and opioid-related products, since these medicines are amongst “taboo” topics in Nigeria and controlled drug prescriptions are

restricted. Previous researches has shown that of the largest cancer centers in the south of Nigeria are still on the yet to adapt stage of palliative care. (Adriaansen, 2015). But as a similar case opined by Edwards and Blenkinsopp 2019 the task however have been much more daunting than expected. Patients with end-stage cancers were emotional and sensitive when asked about how they felt. Apart from the physical pain, these patients suffered pressures from their family members, the possibility of job loss, financial problems and the fear of death. They were sensitive and vulnerable when telling their stories. These clouded their assessments. It is also noticeable that Nurses prepare and administer medicines according to doctors' orders. Pharmacists ensure timely supply of the prescribed medicines. In line with a report by Chan, 2018. Everyone does his job in isolation. Medical hierarchy and heavy workload are amongst the main reasons that doctors, nurses and pharmacists seldom closely interact. The holistic care model does not exist in this medical field in Benin City. In line with an opinion of Edwards and Blenkinsopp; 2019. It has therefore become imperative that the potential for a larger practical area of palliative care practice is certainly required.

And palliative care is still in the initial set up phase in Nigeria. (Barbee *et al*, 2017.) The idea of an interdisciplinary team model has not been introduced. From the above perspectives, there are three reasons: a lack of well-trained pharmacists in palliative care, a prejudice of physicians against the clinical involvement of pharmacists and a lack of government policy on the practice of pharmacists in this specialty. This research project therefore is to explore, observe and assess how clinical pharmacists can contribute to palliative care in some typical settings within Nigeria using Benin City of Edo state as a case study. Anecdotal evidence from experienced pharmacists well equipped with practical

lessons will postulate similar services recommendations. Moreover, this research project will offer an opportunity to observe day-to-day activities of pharmacists working within hospital services, which would provide a process of how to initiate a model of pharmaceutical care in palliative care, in terms of novelty in health research. There has been limited numbers of study investigating how pharmacists in Nigeria become involved in the palliative care area. This project, therefore, has drawn a picture of current pharmacy practice in the palliative care service in Nigeria.

1.10 OBJECTIVES OF THE STUDY.

Main Objectives

The objective of this research study is to explore the role of clinical pharmacists in the palliative care of cancer patients in other to improve the quality of life for the patients

Specific objectives.

1. This research aims to investigate the extent to which clinical pharmacists are involved in hospital palliative care.
2. To evaluate the general knowledge of the clinical pharmacist in palliative care of cancer patients and its principles.
3. To ascertain and highlight the knowledge of the clinical pharmacist in carrying out palliative care of patients.
4. To evaluate opinion on relevant attitude-related statements toward palliative care.

5. To clarify the extent of pharmacists involvement in general and palliative care services in their respective practice sites.
6. To explore possible factors that may hinder involvement in palliative care of cancer patients.

CHAPTER TWO

METHODS

2.0.1 STUDY DESIGN

This study is a self-administered questionnaire-guided survey among registered pharmacists working in the two selected tertiary hospitals with established palliative care and cancer (oncology unit) services.

2.0.2 SETTING

The study was conducted at the Pharmacy departments of selected hospitals namely University of Benin Teaching Hospital (UBTH) Benin City, and Central hospital Benin City (CHB). The UBTH is a premier teaching hospital in Nigeria, affiliated with University of Benin with an oncology unit that has a well-managed bed spaces for patients of differently diagnosed oncological conditions. The pharmacy unit is located within the oncology ward thereby enabling an easy access to drugs. While CHB is a state owned care hospital established with a special focus on chronic disease management as well as essential palliative care. The hospitals are federal healthcare institution and state owned hospital respectively. Strategically located within the Benin City of the south-south geopolitical zone in Nigeria, and are the major sites for undergraduate and post-graduate residency training for physicians, as well as clinical training for other categories of healthcare practitioners including pharmacists, nurses and other ancillary healthcare personnel.

2.0.3 STUDY POPULATION

The study population was Post-intern Hospital pharmacists working in the two selected hospitals.

Sample size determination

Number of eligible pharmacists from each hospital was obtained from the respective institutions as: UBTH = 43 and CHB to be 7, given a total estimated population of 50 pharmacists in the two selected facilities. Based on the estimated population at 95% confidence level and 5% margin of error, a sample size of 92 will be obtained using Slovin's sample size formula. $n=N/(1+Ne^2)$

Where n is the sample size,

N is the population

e is the margin of error

Adjusting for a 10% non-response rate will give a target sample population of approximately 42 the proportion of pharmacists recruited from each facility was subsequently guide as follows:

UBTH ð 43/50 X 92 ¼ =36. CHB ð 7/50x42=6.

Where the numerator denotes number of eligible pharmacists in the respective hospital, while the denominator represents the estimated population. The total of 42 copies of questionnaire was given to the pharmacists in the two selected hospital. 36 sample size for UBTH and 6 samples for CHB.

2.0.4 INCLUSION AND EXCLUSION CRITERIA

Post-intern hospital pharmacists who consented to participate in the study were enrolled, while pharmacist interns and pharmacist with less than 1 year experience in hospital practice were excluded.

2.0.5 ETHICAL CONSENT

Ethics approval for the study was obtained from the University of Benin/University of Benin Teaching Hospital Ethics Review Committee. With the approval registration number **NHREC-UBTH-HREC/24/01/202** this approval was issued 14th of February, 2024. Permission was also obtained from the Head of Pharmacy department of the respective hospital. Verbal informed consent in accordance with the approved study protocol by the Ethics committee was obtained from individual participant after explaining the objectives and procedure of the study to participant individually.

The study was strictly a questionnaire-based survey with questions carefully designed without infringement on pharmacist's privacy, only the consented participants within the study period was enrolled.

2.0.6 DATA COLLECTION INSTRUMENT

The main instrument used for data collection was a semi structured questionnaire developed by the investigator following extensive review of relevant studies, as well as utilizing previous experience from palliative care training. The questionnaire consists of five sections. **Section A**: which was written by the researcher, captured demographic characteristics, years of experience in hospital practice, previous training in palliative care, as well as cadre/rank. **Section**

B: which was written by the researcher contains 18-item questions to evaluate the general knowledge of the clinical pharmacist in palliative care of cancer patients. **Section C:** evaluated opinion on relevant attitude-related statements toward palliative care which was adapted from Pitzen (2019). The attitude questions contain a 5-point Likert scale response option ranging from strongly disagree to strongly agree for positive statements, and a reversed score for the negative statements. **Section D** which was written by the researcher contains item-statements that clarified the extent of involvement in some palliative care services in their respective practice site, while **Section E**: which was written by the researcher contains questions that explored possible factors that may hinder involvement in palliative care.

Pretest and content validation

The questionnaire was assessed for content validity by the project supervisor from the department of Clinical Pharmacy and Pharmacy practice, University of Benin, and also 10 randomly selected hospital pharmacists to ascertain the comprehensiveness of question-items vis-à-vis the study objectives, as well as ensuring that there are no ambiguous questions or statements. Subsequently, the questionnaire was given to two pharmacists chosen from a state-owned specialist hospital notable for chronic disease management, to ascertain the ease of comprehension of the item-statements. Feedback from the pretest and content validation led to few modifications in the questionnaire such as rephrasing of a dichotomous Yes/No response option as a "true" or false. Answer for questions on general knowledge in palliative care. Also, the redesigning of attitude statements from a Yes/No answer into a Likert scale response option to ensure clarification of opinion and assigning of numerical value during data analysis.

Sampling and data collection procedure

Eligible hospital pharmacists were enrolled using purposive sampling approach by visiting individual pharmacist in their respective practice site. Objectives of the study were explained to every pharmacist after whom voluntary verbal informed consent was obtained to signify intention to participate in the study. The questionnaire was self-administered by all consented Pharmacists and retrieved within 25–30 minutes of completion of the questionnaire. Anonymity and confidentiality of response was well assured, while participation was entirely voluntary.

2.0.7 DATA ANALYSIS

Data obtained were sorted, coded and entered in Microsoft Excel spreadsheet file for ease of data management, and subsequently the computed data was exported into SPSS version 21.0 for analysis Descriptive statistics including frequency and percentage was used to summarize the data. In this study, the overall score by pharmacists in the knowledge and attitude domains developed for the purpose of this study was converted into percentage to ensure uniformity in the scores. In the knowledge domain, a total score **> 75%** was considered as "adequate" knowledge, while score **≤ 75%** signified "inadequate knowledge. In other word, a percent score **> 75%** indicates a raw score of > 13 out of the 18 questions that evaluated the general knowledge in palliative care; > 6 out of 8 questions on knowledge of diseases that mostly require palliative care service; and > 5 out of 7 questions on knowledge of palliative care team composition. In the attitude domain, a total ranked score > 75% was considered as "positive" attitude, that is, a raw score of ≥49 out of maximum obtainable score of 65, while a ranked score ≤ 75% signified "negative" attitude towards palliative care. The cut-off criteria for the binary categorization was adapted from Bloom's cut-off point criteria, as well as review of other related studies.

Pearson Chi-square (X2) test was used to investigate association between demographic characteristics, as well as years of experience in hospital practice and general knowledge in palliative care. Mann-Whitney U (MWU) test was used to evaluate association among pharmacists with or without palliative care training and opinion on attitude-related statements, while relationship between hospital of practice by pharmacists and attitude towards palliative care was investigated using Kruskal-Wallis (K-W) test at $p < 0.05$ level of statistical significance.

CHAPTER THREE

RESULTS

3.1 Socio-demographics and practice information of pharmacists (n) N=40

Table 3.1 presents the socio-demographic and social characteristic of the pharmacists. All the 42 pharmacists who were enrolled responded to the questionnaire, given a response rate of 100%. The majority (85.7%) of pharmacists participated from UBTH, 14.28% from CHB. Details of demographic characteristics and years of experience in hospital practice are shown in Table 3.1. More than half (69%) were in the age range of 31–40 years, while 71% were females and 23.81% had additional postgraduate qualification. About half (47.6%) were mostly in the pharmacist grade one cadre (i.e. within 1 to 3 years of full-time hospital employment), and 11.90% of the pharmacists had worked in the general inpatient pharmacy unit within the last 2 years prior to the commencement of this study, 35.71% in accident and emergency, 23.81% in oncology, in gynecology, and 14.29%, in male and female surgical pharmacy 14.29% as a member of palliative care team. 38.1% had encountered patients requiring palliative care, while 23.81% had previously attended a palliative care related training.

Table 3.1: socio-demographics and practice information of pharmacists

VARIABLES	FREQUENCY	PERCENTAGE (%)
AGE (years)		
20-30	5	11.90
31-40	29	69
41-50	4	9.5
51-60	4	9.5
>60	0	0
GENDER		
Female	30	71
Male	12	28
HIGHEST LEVEL OF PHARMACY QUALIFICATION COMPLETED		
Associate degree	0	0
Bachelor's degree	30	71.4
Master's degree	10	23.81
Doctoral degree	2	4.76
YEARS OF PRACTICE		
1-2	10	23.81
2-3	12	28.57
>4	20	47.62
LEVEL OF CADRE OF PHARMACY		
Pharmacist 1	20	47.61
Senior pharmacist	10	23.81
Principal pharmacist	10	23.81
Chief pharmacist	2	4.76
SECTIONS WORKED IN PAST 2 YEARS		
In- patient medical	5	11.90
Oncology	10	23.81
Accident and emergency	15	35.71
Male and female surgical	6	14.29
Gynecology pharmacy	6	14.29
ATTNDANCE OF PALLIATIVE TRAINING		
Yes	10	23.81
No	32	76.19
ATTENDANCE OF PLIATIVE CARE CONFERENCE		
Yes	9	21.43
No	33	78.57
ENCOUNTERED PATIENTS REQUIRING PALLIATIVE CARE		
Yes	16	38.1
No	26	61.90

3.2 Knowledge test questions in palliative care of cancer patients and its key principles

The table 3.2 shows the general knowledge of pharmacists in palliative care. 95.23% understood that long-time use of opioids for palliative care patients does not often results in addiction. 95.23% felt that the goals of palliative care are consistent with the philosophy of pharmaceutical care, while 57.14 had a misconception that medication therapy is the cornerstone of all symptom control palliative care. Overall, 21.1% had score >75% indicating “adequate” knowledge of palliative care and its principles.

Table 3.2: Knowledge test questions in palliative care of cancer patients and its key principles

STATEMENT	TRUE(n) %	FALSE (n)%
1 Palliative care involves provision of care only to patients Who have no curative treatment available.	23 (54.76)	19(45.24)
2 Non-medical practitioners are active participant in palliative Care	30(71)	12(28.57)
3 Palliative care is to be provided by doctors and nurses alone	10(23.81)	32(76.19)
4 Palliative care is required only for patients who are near death	28(66.66)	14(33.33)
5 Palliative care only involves pain management	20(47.62)	22(53.38)
6 Palliative care involves providing patients with relief from their Symptoms	35(83.3)	7(16.6)
7 Regular opioids intake should not be combined with non-steroidal Anti-inflammatory drugs for palliative care patients	40(95)	2(4.76)
8 Long term use of opioids for palliative care patients does Not often Induce addiction	40(95.23)	2(4.76)
9 Palliative care should not be provided alongside anti-retroviral Treatment	5(11.90)	37(88.09)
10 One of the goals of pain management in palliative care is to get Good night sleep	42(100)	0(0)
11 Benzodiazepines should be effective for controlling Delirium in palliative care patients	40(95.23)	2(4.76)
12 Palliative care does not involve maintaining patient Medication profile overtime	4(9.52)	38(90.47)
13 Palliative care should not be provided in conjunction with Curative care at the time of diagnosis of a Potential life-limiting illness.	6(14.28)	36(85.71)
14. The goals of palliative care and pharmaceutical Care is consistent.	2(4.76)	40(95.23)
15 Medication therapy is the cornerstone of all symptom Control in palliative care.	18(42.86)	24(57.14)
16 Involvement in palliative care activities by pharmacists May decrease the need for medical emergencies	40(95.63)	2(4.76)
17 Pharmacist in palliative care should be less concerned About monitoring Non-prescription medication use for Safety and effectiveness	2(4.76)	40(95.23)
18 Pharmacists in palliative care communicate with Pharmaceutical Manufacturers to determine the Availability of nonstandard dosage forms	38(90.47)	4(9.52)
Cut-off for overall percent score	n (%)	Remarks
> 75	9(21.43)	Adequate
≤75	33(78.57)	Inadequate

a = Correct answer. Maximum obtainable score = 18; % individual score = score obtained by an individual ÷ total obtainable score × 100, n = number.

Table 3.3: provides information on the knowledge of pharmacists in relation to palliative care team composition, as well as diseases that mostly require palliative care service. From

the data collected, 54.76% were absolutely correct in citing all the listed categories of professionals as a possible member of palliative care team this is clearly shown in Table 3.3.

Table 3.3 Pharmacist's knowledge of diseases requiring palliative care and palliative care team composition

VARIABLES	RESPONSE CATEGORY	
DISEASES REQUIRING PALLIATIVE CARE	**YES (%)**	**NO (%)**
Cardiovascular diseases	23(54.76)	19(45)
HIV/AIDS	40(95.23)	2(4.76)
Renal diseases	38(90.47)	4(9.52)
Peptic ulcer diseases	3(7.14)	39(93)
Asthma	5(11.90)	37(88)
End stage pulmonary diseases	41(97.61)	1(2.4)
Parkinson disease	40(95.23)	2(4.8)
Dementia	41(97.61)	1(2.4)
Cut-off for overall percent score Frequency (%) Remark		
> 75 9(21.42) Adequate		
≤ 75 33(78.57) Inadequate		
Palliative care team composition includes		
Physician	42(100)	0(0)
Pharmacist	37(88)	5(11)
Nurse	40(95)	2(4.8)
Psychologist	23(54.8)	19(45)
Chaplain	10(23.8)	32(76)
Social worker	25(59.5)	17(40)
All of the above	23(54.76)	19(45)
Cut-off for overall percent score Frequency (%) Remark		
> 75 37(88.09) Adequate		
≤ 75 5(11.90) inadequate		

a = Correct answer, b = most correct answer, n = number, maximum obtainable score for questions on knowledge of diseases requiring palliative care = 8, and palliative care team composition = 7; % individual score = score obtained by an individual ÷ total obtainable score × 100. Cancer is excluded as a response option because it is well-known that patients with cancer will require palliative care.

3.4: Attitude towards palliative care of cancer patients

Response of pharmacists to attitude-related statements is shown in Table 3.4. 41.3% enjoyed working in palliative care, 57.0% felt confident in managing symptoms in palliative care, while 83.3% believed that it is rewarding to work with people receiving palliative care. A total of 12.8% demonstrated “positive” attitude towards palliative care.

Table 3.4: Assessment of pharmacist’s attitude towards palliative care

ATTITUDE STATEMENT RELATED TO PALLIATIVE CARE	SD (1) n (%)	D (2) n (%)	U (3) n (%)	A (4) n (%)	SA (5) n (%)
1. Those who enjoyed working in palliative Care	6(15)	22(55)	5(12.5)	4(10)	3(7)
2. feel relaxed around people receiving Palliative care	4(10)	10(25)	20(50)	3(7.5)	3(8)
3. feel confident in managing symptoms in palliative care	1(2.5)	8(20)	10(25)	20(50)	1(2.5)
4. feel comfortable talking about dying to a patient receiving Palliative care	4(10)	19(48)	7(17.5)	5(13)	5(13)
5. don't mind working in palliative care despite its Involvement in People with life-limiting illness	4(10)	10(25)	21(53)	3(7.5)	2(5)
6. There is a difference between providing Palliative care Service and normal hospital Care	1(2.5)	22(55)	6(15)	6(15)	5(13)
	SD (5) n (%)	**D(4) n(%)**	**U(3) n(%)**	**A(2) n(%)**	**SA(1) n(%)**
7. Those not comfortable touching people With terminal illness	6(15)	21(15)	5(12.5)	5(12.5)	3(7.5)
8. Don't believe that pharmacists have any role to play as a member of palliative care team	34(85)	2(5)	2(5)	2(5)	0(0)
9. I feel frustrated because I do not know how to help people Receiving Palliative care	10(25)	25(67)	3(8)	2(5)	0(0)
10. It is not rewarding to work with people who are receiving Palliative Care	11(27.5)	24(60)	0(0)	5(12.5)	0(0)
11. I am not familiar with pain symptoms necessary for palliative Care	7(17.5)	18(45)	7(17.5)	6(15)	2(5)
12. Working with terminally ill patients is Sad and depressing	5(12.5)	10(25)	2(5)	18(45)	5(12.5)
13. Emotionally do not fit into palliative care	4(10)	20(59)	7(17.5)	5(13)	4(10)
Cut-off for overall percent attitude score				Frequency (%)	Remark
> 75				34 (85)	Positive Attitude
≤ 75				6 (15)	Negative Attitude

Maximum obtainable score = 65; % individual score = score obtained by an individual ÷ total obtainable score × 100. Statements 1 to 6 are positive attitude items, and 7 to 13 are negative attitude items. Strongly disagree (SD), Disagree (D), Undecided (U), Agree (A), Strongly agree (SA), n = **number. n=40**

3.5 Clarification of the extent of pharmacist's involvement in general patients and palliative care services.

From Table 3.5 shows the perceived extent of pharmacist's involvement in general patient and palliative care services. Counseling on therapy adherence 74%, as well as ensuring complete labeling and direction for medication usage 100% were the most frequently engaged activities. Giving educational sessions 48% and attending clinical meetings to advise other health team members 48.9% were largely cited as occasionally performed duties, while patient home visit was mostly cited 100% as a duty not done at all.

Table 3.5: clarification of the extent of pharmacist's involvement in general and palliative care services

Involvement in palliative and patient care as a pharmacist entails:	Not at all n(%)	Rarely n (%)	Occasionally n (%)	frequently n (%)
1. Explain misconceptions about addictive Medication.	0(0)	3(7)	5(12)	34(80.9)
2. Visited patients' homes to communicate Directly with patients and their caregivers And to make necessary assessments	42(100)	0(0)	0(0)	0(0)
3. Monitor patients' medication profile for Safety and Effectiveness	0(0)	3(7)	10(24)	29(69)
4. Provide patients with essential medications That ensures continuous symptom control	0(0)	0(0)	0(0)	40(100)
5. Attend clinical meetings to advise Other members of healthcare team About medication therapy	2(5)	10(24)	20(48)	10(23)
6. Advise clinical team on dosage forms And adjustments, routes of administration, Costs, and availability of various drug Products.	0(0)	2(5)	10(23)	30(71)
7. Give educational sessions	2(5)	0(0)	20(48)	20(48)
8. Advise members of the clinical team about the potential for toxicity and interactions with Dietary supplements and alternative therapies	2(5)	0(0)	10(23)	30(72)
9. Ensure that all medication labeling is complete And understandable by patients and their Caregivers.	0(0)	0(0)	0(0)	42(100)
10. Communicate with patients about the Importance of adhering to the prescribed Drug regimen.	0(0)	0(0)	10(23)	32(74)
11. Monitor all prescription and nonprescription Medication use.	2(5)	2(5)	2(5)	36(85)
12. Counsel patients about potential toxicity of alternative and complementary therapies	0(0)	2(0	30(71)	10(23)
13. Extemporaneous preparation of non- Conventional dosage forms. For ease of administration to patients	2(5)	5(12)	20(47)	15(35)
14. Prepare flavoring medications to promote Compliance	2(5)	5(12)	20(47)	15(35)
15. Address issues on cost of patients' medications	5(12)	2(5)	15(35)	20(47)
16 Ensure that drug disposal is in compliance with Federal and state drug control and environmental laws	10(23)	2(5)	20(47)	10(23)

3.6 Barriers/ factors limiting pharmacist's involvement in palliative care of cancer patients.

Perceived factors limiting involvement in palliative care are shown in Table 3.6. Pharmacist's unawareness of their need in palliative care 75% was one of the limiting factor for palliative participation, while non-accessibility to patients' medication profile 87.5%, inadequate knowledge of the concept of palliative care among pharmacists 62.5%, as well as Lack of reimbursement which was 100% were also cited as barriers.

Table 3.6: showing suspected Barriers/ factors limiting pharmacist's involvement in palliative care of cancer patients

General factors items list	Yes, n (%)	No, n (%)	Don't know n (%)
1.Lack of awareness of the need for pharmacists in palliative care	30(75)	10(25)	0(0)
2 Lack of access to patients' medication profile	35(87.5)	5(12.5)	0(0)
3. Inadequate knowledge of palliative care among pharmacists	15(37.5)	25(62.5)	0(0)
4. Confusion of role in palliative care.	38(95)	2(5)	0(0)
5. Inadequate knowledge of concept of palliative care	25(62.5)	15(37.5)	0(0)
6. Lack of reimbursement	40(100)	0(0)	0(0)
7. Lack of pharmacists' interest to work in palliative care	30(75)	10(25)	0(0)
8. Fear of being around people with terminal illness	15(37.5)	20(50)	5(12.5)
9. Belief that there could be a spiritual backlash from engaging in palliative care.	20(50)	10(25)	10(25)

(n) number= 40

3.7 show relationship among pharmacists with or without palliative care training and opinion on attitude-related statements.

Pharmacists who had training in palliative care were mostly found to be familiar with pain symptoms in palliative care (Mean rank [MR] = 69.24) compared to MR of 47.59 among those without training [MWU = 499.000, two-tailed p value = 0.002].

Table 3.7 Association among pharmacists with or without palliative care training and attitude-related statements toward palliative care

STATEMENTS	Previous Training	N	Mean Rank	M WU P-value
1. enjoyed working in palliative care	YES	21	30.79	
	NO	85	59.11	<0.001*
2. feel relaxed around people receiving palliative care	YES	21	67.57	
	NO	81	47.33	0.003*
3. feel confident in managing symptoms in palliative care	YES	21	58.12	
	NO	83	51.08	0.299
4. feel comfortable talking about dying to a patient receiving palliative care	YES	21	58.36	
	NO	82	50.37	0.251
5. don't mind working in palliative care despite its involvement in managing people with life limiting illness	YES	21	56.25	
	NO	84	52.14	0.525
6. There is a difference between providing palliative care service and Normal hospital care.	YES	21	49.40	
	NO	85	84.51	0.457
7.I am not comfortable touching people with terminal illness	YES	21	57.76	
	NO	83	51.17	0.335
8. Don't believe that pharmacists have any role to play as a member of palliative care team	YES	21	53.12	
	NO	85	53.59	0.940
9. feel frustrated because I do not know how to help people receiving palliative care	YES	21	58.10	
	NO	83	51.08	0.303
10. It is not rewarding to work with people who are receiving palliative care	YES	21	56.86	
	NO	84	52.84	0.481
11. Not familiar with pain symptoms necessary for palliative care	YES	21	69.24	
	NO	82	47.59	0.002*
12. Working with terminally ill patients is sad and depressing	YES	21	58.76	
	NO	83	50.92	0.267
13. Emotionally, Don't fit into palliative care	YES	20	55.88	
	NO	81	49.80	0.391

N =Number, * Significant difference with Mann Whitney U (MWU) test. Higher mean rank for positive statements (1–6) indicate those who mostly agreed with the corresponding statement, while higher mean rank for negative statements (7–13) suggest those who least agreed with the corresponding statement, level of statistical significance $p < 0.05$

Hospital of practice by pharmacists significantly influenced their opinion on some attitude-related statements toward palliative care such as feeling of confidence in managing symptoms in palliative care, MR for CHB > UBTH [K-WX2 = 7.016, df = 2, two-tailed p value = 0.03 (see Table 3.7).

Table 3.8: Association between pharmacists' hospital of practice and attitude-related statements toward palliative care.

Statement	Hospital Of practice	N	Mean Rank	K- W P-value
1. Enjoyed working in palliative care	UBTH	58	54.3	
	CHB	15	55.5	0.996
2. Feel relaxed around people receiving Palliative care	UBTH	55	51.82	
	CHB	15	61.68	0.42
3. Feel confident in managing symptoms In palliative care	UBTH	57	52.55	
	CHB	15	61.93	0.03*
4. Feel comfortable talking about dying to a patient receiving palliative care	UBTH	56	49.62	
	CHB	15	69.20	0.037
5. Don't mind working in palliative care Despite its involvement in managing People with life limiting illness	UBTH	58	48.09	
	CHB	15	69.20	0.02*
6. There is a difference between providing Palliative care service and normal hospital Service.	UBTH	58	55.02	
	CHB	15	46.57	0.49
7. Not comfortable touching people With terminal illness	UBTH	56	54.68	
	CHB	15	64.73	0.18
8. Don't believe that pharmacists have any role to play as a member Of palliative care team	UBTH	58	54.82	
	CHB	15	51.57	0.43
9. I feel frustrated because I do not know How to help people receiving Palliative care.	UBTH	57	51.32	
	CHB	15	63.43	0.35
10 it is not rewarding to work with people Receiving palliative care.	UBTH	58	51.32	
	CHB	15	54.37	0.88
11. I am not familiar with pain symptoms Necessary for palliative care.	UBTH	58	51.32	
	CHB	14	66.43	0.03*
12. Working with terminally ill patients is Sad and depressing.	UBTH	58	46.32	
	CHB	14	65.29	0.27
13. Emotionally I don't fit into palliative care	UBTH	55	48.27	
	CHB	15	59.57	0.31

N Number, * Significant difference with Kruskal-Wallis (K-W) test. Higher mean rank for positive statements (1–6) indicate those who mostly agreed with the corresponding statement, while higher mean

rank for negative statements (7–13) suggest those who least agreed with the corresponding statement. Level of statistical significance $p < 0.05$. CHB. Central hospital, Benin city, UBTH. University of Benin Teaching Hospital.

Also, statement related to the extent of familiarity with pain symptoms in palliative care significantly differed among pharmacists from different practice sites, MR for CHB > UBTH (K-WX2 = 7.241, df = 2, two-tailed p value = 0.03). Years of experience in hospital practice, 1–10 versus > 10 years (Pearson X2 = 0.261, df = 1, two-sided p = 0.609), previous attendance in palliative care training or not (X2 = 0.108, df = 1, p = 0.74), gender (X2 = 0.563; df = 1, p = 0.453) and hospital of practice by pharmacists (X2 = 1.89, df = 2, p = 0.388) did not significantly influenced pharmacists' general knowledge in palliative care.

CHAPTER FOUR

DISCUSSION

This study was conducted to evaluate the knowledge, attitude and involvement of hospital pharmacists in selected hospitals in palliative care, while factors that may hinder their participation in palliative care were also explored.

Based on the Knowledge test questions in palliative care of cancer patients and its key principles, From the result obtained, using a cut off score of ≤75 of the total respondents which is 78.57% showed inadequate knowledge of palliative care of cancer patients and its key principles (O'Connor *et al*., 2019). In the Australian nationwide survey reported that clinical pharmacist's participant in their study had good knowledge of some aspects of palliative care but misconception about others. Some studies from developed countries have also identified low level of knowledge of palliative care among pharmacists. However, perusing the response of the study participants to the knowledge questions gave highlights on the areas of strength and common misconception about palliative care. (Zhang *et al*., 2018).

From the result of the Information on the knowledge of pharmacists in relation to palliative care team composition, as well as diseases that mostly require palliative care service, A total of 54.76% of the respondents were absolutely correct in citing all the listed categories of professionals as a possible member of palliative care team. This indicates clinical pharmacists have theoretical knowledge of the pathophysiology of diseases requiring palliative care. In line (Rasak *et al*., 2018). The curriculum of pharmacy training entails basic principles of pathophysiology and pharmacotherapeutic applications.

Considering the result obtained on the attitude of hospital pharmacists towards palliative care of cancer patients, only 12.8% of the total respondents demonstrated positive attitude towards

palliative care. A lot of clinical pharmacists are not involved in providing hospital palliative care this can be attributed to negative attitude, inadequate general knowledge of palliative care and misconception of pain control in palliative care, the importance of palliative care training in improving the knowledge of pharmacists, as well as facilitating their involvement in providing services for palliative care patients is of great importance Pharmacists' participation as a member of palliative care team can potentially improve (Joranson and Gilson 2018). report on the influence of pharmacists' knowledge and attitude to opioid pain medications and concluded that incorrect knowledge and inappropriate attitude could lead to errors in the service provided for palliative care patients. Belief, support and knowledge have been reported as predictors of pharmacists' overall positive attitude towards palliative care (Connor *et al*., 2019).

Another reason why there have been low levels of pharmacist's involvement in palliative care was the various barriers and limiting factors. Perceived factors limiting involvement in palliative care according to the results obtained, 75% of the total respondent agreed that Pharmacist's unawareness of their need in palliative care was one of the limiting factor for palliative participation, while non-accessibility to patients' medication profile gave a total of 87.5%, inadequate knowledge of the concept of palliative care among pharmacists 62.5%, as well as Lack of reimbursement which was 100% were also cited as barriers. Limited access to patients' medical records has been generally one of the major factors hindering pharmacists' proactive engagement in patient-centered care such as palliative care. However, confidence issues as well as inadequate knowledge and skills necessary for delivering effective palliative care service (Chan, 2018).

Some healthcare professionals such as the clinical pharmacists especially in developing countries are poorly prepared for the complexities of palliative care with key factors influencing involvement to include confidence issues, and inadequate knowledge and skills as well as beliefs and lack of government implementation of the involvement of pharmacists in the palliative care team. (Chan *et al*., 2017). The multifaceted nature of palliative care requires professionals working with patients having life-limiting illness to possess the ability to address psychosocial needs, through effective communication skills. Healthcare providers including pharmacists therefore need to develop excellence in communication skills that will assist in clarifying the psychological and social needs of the patients so as to consistently ensure better therapeutic outcomes. Similar results were seen in a recent study which showed that in addition to possessing effective communication skills by the pharmacists, clinical experience especially in pain management and symptom control is equally important but its lacking in clinical pharmacists. (Anifowose *et al*., 2019).

From the result based on the clarification of the involvement of pharmacists in palliative care, Counseling on therapy adherence 74%, as well as ensuring complete labeling and direction for medication usage 100% were the most frequently engaged activities. Giving educational sessions 48% and attending clinical meetings to advise other health team members 48.9% were largely cited as occasionally performed duties, however, previous research works carried out has shown that hospital pharmacists are mostly indulged in the above-mentioned activities thereby neglecting the palliative care demand as hospital services, (Farber, 2018).

Based on the result obtained from the Association among pharmacists with or without palliative care training and attitude-related statements toward palliative care, it was also seen that there was

no significant relationship between pharmacist's hospital of practice and attitude towards providing palliative care. There was statistically significant difference of ($p<0.05$). The result obtained is in concordance with a recent study by Anifowose *et al*, 2019. That less than 90% of the pharmacists reported they don't enjoy working in palliative care, they feel uncomfortable to been around people receiving palliative care and they are not familiar with pain symptoms. But Delivery of excellent palliative care requires collaborative input of physicians, pharmacists, nurses and psychosocial careers in a holistic framework, thereby fostering increased confidence with improved quality of care to patients. Therefore, the low level of involvement can be greatly attributed to the shortfall of the role pharmacists should play in the palliative care. (Anifowose *et al* , 2019).

Based on the Association between pharmacists' hospital of practice and attitude-related statements toward palliative care, there was a significant difference of ($p<0.05$) between hospital of practice and attitude of the hospital pharmacists towards palliative care. This however is due to the various limits of pharmacist's involvement in palliative care as well as their inadequate knowledge. In addition, studies especially in developed countries have identified and reported pharmacists' positive contributions in palliative care. Overall, approximately one-eighth demonstrate positive attitude towards palliative care, with slightly more than half who felt confident in managing symptoms in patients receiving palliative care, while 41.3% enjoy working in palliative care. However Research indicates that many healthcare professionals especially in developing countries are poorly prepared for the complexities of palliative care. (Hussainy *et al*., 2017).

LIMITATIONS

This study has some limitations. First, its limitation may include the small sample size, though representative of the pharmacists' population in the studied hospitals. Also, only content validity and pretest of the study instrument were done rather than subjecting the questionnaire to all the validation checks typically require for a health-related patient reported outcome

Secondly, there may be possibility of bias with some questions or statements. Nevertheless, this study focused largely on hospital pharmacists' knowledge, attitude and involvement in palliative care, thus, the rigorous validation checks may not be strictly essential.

Thirdly, the item statements in the questionnaire for our study covers a wide-range of aspects in palliative care which may partly allow for a comprehensive exploration of participants on the subject area, hence, a useful strength for our study.

Finally, Another limitation may be linked to the fact that, the study was carried out in tertiary hospitals with established palliative care services, thus the need for caution in generalizing the findings to the entire population of hospital pharmacists in the region.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

This study has clearly demonstrated the inadequate general knowledge, as well as negative attitude towards palliative care of cancer patients by the clinical pharmacists. Also, their involvement in core palliative care service is generally low, with factors responsible such as unawareness of their need in palliative care.

This perhaps suggest a need for inclusion of palliative care concept into the pharmacy education curriculum, while mandatory continuous professional development programme for practicing pharmacists should also incorporate aspects detailing fundamental principles of palliative care, in order to bridge the knowledge and practice gaps. Training to be designed for pharmacists should be focused on building knowledge as well as promoting positive attitude and values about palliative care. Government policies should be geared towards increasing palliative care by ensuring implementation pharmacists incorporated palliative care practice.

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