DEVELOPMENT OF A PROGRAMME TO MANAGE CANCER SERVICE DELIVERY IN PRIMARY HEALTH CARE CLINICS IN BOTSWANA

by

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DECLARATION

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I declare that the thesis is my own work and all sources used have been indicated and acknowledged by means of complete references.

I further declare that I submitted the thesis to originality checking software and that it falls within the accepted requirements for originality.

I further declare that I have not previously submitted this work, or part of it, for examination at Unisa for another qualification or at any other higher education institution.

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SIGNATURE DATE

DEDICATION

I dedicate this thesis to persons diagnosed with any type of cancer across different communities in Botswana and to the nurses providing services in primary health care clinics, for the time accorded to the interview on cancer service delivery in their local clinics, as their responses brought life to this study.

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ABSTRACT

Introduction

Cancer remains a growing public health concern in Botswana, placing a burden on primary health care systems. Effective management and delivery of cancer services at the primary care level are essential to improve early detection, referral, and treatment outcomes.

Purpose

The purpose of this study was to develop a programme for the management of cancer services and treatment for adults in Botswana primary health care clinics.

The study was conducted in primary healthcare clinics situated in Molepolole, Kanye and Ramotswa for nurses. Although patients were seen at local clinics for follow-up care, the researcher, through the guidance of oncology nurses, accessed patients' records pertaining to cancer treatment received at the main oncology clinic situated in Princess Marina Hospital in Gaborone. Participants were recruited in these areas, respectively, followed by data collection. All sites are in the southern part of Botswana.

Methods

A convergent parallel mixed methods approach guided the study in three phases. Data were collected simultaneously, analysed independently, and the findings were merged at the end and discussed. Phase 1 addressed two objectives of the study using a qualitative approach to explore the perceptions of Registered nurses in Primary health care clinics regarding the management of cancer patients using a purposive sample consisting of 32 registered nurses. Thematic analysis was used to analyse data. A quantitative approach, in line with Objective 2, was utilised to assess cancer patients

(n = 135), outcomes regarding their quality of life and satisfaction with services received in primary healthcare clinics, using the EuroQol EQ-5D instrument to collect data and SPSS Version 27 was used to analyse data. Based on a confidence level of 95% and a margin of error of 5%, the sample size for cancer patients was 135 and was recruited at an oncology clinic in a tertiary hospital when they turned up for review, because in primary healthcare clinics they do not keep their records. Phase 2 involved a scoping review to determine and map out the existence of programmes for managing cancer. Phase 3 was the development and validation of a programme to support cancer care and services in primary health care clinics.

Findings

In Phase 1 (the qualitative phase), four major themes emerged, which were: Lack of knowledge and skills on cancer care; delays in the diagnosis of cancer; the need to support cancer patients; and a programme to guide cancer care services. The results were consistent with findings from cancer patients (quantitative approach). Out of 135 cancer patients interviewed, most patients (80%) rated services from primary healthcare clinics as unsatisfactory, indicated a lack of support from the local clinics, and rated services as poor.

Coclusion

The study found that primary healthcare clinics in Botswana are currently not adequately equipped to deliver comprehensive cancer care services. There is a need to develop and implement a structured programme that focuses on improving healthcare provider competencies, strengthening early detection and referral systems, and enhancing psychosocial and clinical support for patients.
Recommendations

The developed programme is envisioned to improve the quality of care for cancer patients. Findings would inform policymakers to resource primary healthcare clinics, such as availing oncology-trained personnel and upskilling those not trained in oncology. A programme would promote standardisation of care to improve cancer service delivery and may also serve as a model for other countries with similar backgrounds and needs.

Keywords: Cancer care, Service delivery, Program development, Registered nurses, Cancer patients, Quality of life, Mixed methods.

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ABBREVIATIONS AND ACRONYMS

BEHSP	Botswana Essential Health Services Package
BNHP	Botswana National Health Policy
CPD	Continuous Professional Development
CBE	Clinical Breast Examination
ICN	International Council of Nurses
IARC	International Agency for Research on Cancer
LMICs	Low- and middle-income countries
MMAT	Mixed Methods Appraisal Tool
PHC	Primary Health Care
PROM	Patient Reported Outcome Measure
NCDs	Non-communicable diseases
NCCN	National Comprehensive Cancer Network
NCI	National Cancer Institute
UICC	Union for International Cancer Control
VIA	Visual Inspection with Acetic Acid
WHO	World Health Organization.

CHAPTER 1: INTRODUCTION

1.1 INTRODUCTION

Cancer is one of the four major non-communicable diseases (NCDs) and contributes significantly to global mortality, alongside other NCDs that together account for approximately 82% of all NCD-related deaths. The other three NCDs are cardiovascular diseases, diabetes, and chronic respiratory diseases (WHO 2018:106-108, Report on NCDs). Cancer, like other NCDs, is associated with four common modifiable risk factors: smoking, harmful use of alcohol, unhealthy diet, and lack of physical exercise (Budreviciute et al. 2020:3; Escala-Garcia et al. 2020:327). According to the WHO Report on NCDs (WHO 2022:86-90), despite the increasing prevalence of cancer, its management is not accorded the importance it deserves, especially in low- and middle-income countries, owing to a lack of resources to facilitate prevention programmes, early diagnoses, and prompt treatment. This study sought to develop a programme for the management of cancer services in primary care clinics in Botswana

1.2 BACKGROUND

Cancer is the leading cause of death and a barrier to increased life expectancy worldwide (Ferlay et al. 2018:360). The World Health Organization (WHO) estimates cancer to be the second leading cause of death before the age of 70 years in 112 of 183 countries (WHO 2023, Global Health Estimates 2000-2019). Further, Sung, Ferlay, Siegel, Laversanne, Soerjomataram, Jemal and Bray (2021:2) posit that cancer is increasingly affecting people across all age groups.

According to Maman and Witz (2018:356), cancer is caused by changes in genes that control how cells function, especially their growth and division. Genetic changes leading to cancer can occur in two main ways: during normal cell division, in which random errors may occur, or through DNA damage caused by harmful environmental factors such as chemicals, ultraviolet (UV) radiation from the sun, and other carcinogenic substances.

A defining feature of cancer is the rapid formation of abnormal cells that grow beyond their usual boundaries, invade adjacent tissues, and spread to other organs, a process

referred to as metastasis (National Cancer Institute 2020: 12-16). Lung, prostate, colorectal, stomach and liver cancers are the most common types of cancer in men, while breast, colorectal, cervical, lung and thyroid cancers are the most common among women (WHO 2018a:106; WHO 2020:502)

Global health estimates indicate that the overall burden of cancer incidence and mortality is growing rapidly worldwide owing to the main risk factors mostly associated with socioeconomic development (WHO 2020:505-527). There were an estimated 19.3 million new cases and 10 million cancer deaths worldwide in 2020, out of which one-half of all cases and 58% of deaths are in Asia, 22.8% of cases and 19.6% deaths are in Europe, 20.9% incidence and 14.2% mortality in America, and 7.2% deaths in Africa (Sung et al. 2021:4). Cancer care has an incomparable level of complexity not only in the various and complex management of the disease itself but increasingly in the variety of service providers, specialities, policymakers, community level, and regulatory bodies overseeing its delivery (You & Hennesberg 2018:145).

According to Sung et al. (2021:894-905) in their study on Recent Mortality patterns and time trends for the major cancers in 47 countries worldwide, the cancer burden continues to grow globally, exerting tremendous physical, emotional, and financial strain on individuals, families, communities, and health systems. Most health systems in low- and middle-income countries are poorly equipped to handle the growing cancer burden due to limited resources and the large number of patients who lack access to timely, high-quality diagnosis and treatment (Sung et al. 2021:4; Islami et al. 2018:31-54).

Bamodu et al. (2024: 24-30) on Cancer Care Disparities: Overcoming Barriers to Cancer Control in LMICs purport that the lack of trained oncology nurses means patients receive less symptom management and psychosocial support, increasing anxiety and suffering during treatment. Wells et al. (2021:379-385) in their study on an Analysis of contemporary oncology randomised clinical trials from low/middle-income vs high-income countries indicated that cancer research is heavily skewed toward High Income Countries (HICs), with disproportionately less research conducted in, and relevant to, the problems of LMICs. Furthermore, Pramesh et al. (2022:106) on Priorities for cancer research in LMICs countries identified some of the focus areas as the need for reduction of the burden of patients presenting with advanced-stage disease through

context-specific strategies at the individual, health system and population level, and another research focus in LMICs as the need to improve access, affordability and outcomes in cancer care through solution-oriented research.

According to the WHO Report on Cancer (2020:501), in developed countries with strong health systems, the survival rates of many types of cancer have improved, coupled with accessible services that include early detection, quality treatment, and survivorship care.

Botswana's health care system is shaped around the primary health care philosophy, emphasising primary prevention of all conditions, including cancer; secondary prevention, which entails early diagnosis and prompt treatment; and, lastly, the tertiary level of disease management, which involves reducing complications and improving quality of life after disease onset. Most people in Botswana do not have health Insurance, so they rely on the public health system, with Primary Health care clinics as the first point of entry. They are also used for continuous basic health care services in cases of chronic conditions such as cancer. It is important to note that the primary healthcare clinics are currently staffed with registered nurses who are not oncology trained.

Specialised oncology services are concentrated in urban referral hospitals located in the southern part of the country. The geographic distribution of these public and private facilities means that a large proportion of the population, particularly those in rural and village areas, has limited access to these essential services. Because of the distance and the high volume of cancer patients from other areas of Botswana, there are usually long queues to see oncology specialists. The majority of Batswana people, especially those without medical insurance, rely mainly on public health facilities, starting with local primary healthcare clinics. The staffing levels in primary healthcare clinics vary with clinic capacity; for this study, primary healthcare clinics with the same capacity and a staff complement of registered nurses, mainly eight to ten, were used. The registered nurses in these clinics do not have oncology training. According to the Botswana Ministry of Health Report on Cancer (2020:20-22), early diagnosis of chronic conditions in local clinics, in particular cancer, is a challenge due to the lack of skilled personnel in oncology in the health facilities, leading to delays in making referrals to the oncology centre (where patients will receive cancer treatment). Most patients were

referred at a later stage when the disease had progressed, making them not amenable to treatment.

Once a cancer diagnosis is made in any of the above named public hospitals (Princess Marina, Sir Ketumile Memorial Teaching Hospital, Nyangabgwe and Letsholathebe) patients are admitted for initiation of cancer treatment and monitoring according to management plan, after which they will be discharged to di-congest the oncology unit, and to continue treatment at home with advice to go to the nearest primary healthcare clinics for further management on other services like wound dressing, nausea, and other challenges they may experience as they continue with cancer treatment. Primary healthcare clinics are part of the cancer management pathway, and yet they are staffed with registered nurses without any skills in managing cancer. This is what prompted this study; the researcher is a community health nurse working in primary healthcare clinics and engages with cancer patients, as well as observes cancer patients deteriorating, leading to death because of inadequate services and skills to manage their condition at local primary health care clinics.

This is a gap in Botswana that the researcher hopes to address. Furthermore, this study is significant because there is a paucity of literature on cancer service delivery in primary care clinics in Botswana, indicating a gap. Therefore, the execution of this study resulted in a programme that is hoped to strengthen primary healthcare clinics in providing better cancer services.

1.3 STATEMENT OF THE PROBLEM

Efforts to disseminate cancer prevention measures and to provide comprehensive cancer care in transitioning countries like Botswana are critical for global cancer control (WHO Report on Cancer 2020:149). According to the Botswana Cancer Registry (2020:15), 2200 cases of the top 10 cancers were recorded in Botswana in 2020, and these are expected to reach 3760 by 2040. Further, Kalita, Devaraja, Saha and Chakrabarti (2024:394) in their study on Global variations in elderly cancer mortality patterns in 2020 and prediction to 2040 in Low-and Middle-Income countries indicated that the burden of cancer is expected to rise to 28.4 million cases in 2040, a 47% rise from 2020 in LMICs. The overall future cancer death was estimated to increase from 7.05 to 12.7 million deaths, representing a total of 80.2 per cent increase in deaths by

2040. This projected increase in mortality is expected to challenge existing healthcare systems, especially in lower- and middle-income countries like Botswana, where resources are limited.

The rising prevalence of cancer in Botswana and the financial burden on individuals, families, communities, and society demand that strategies be put in place to guide Comprehensive care at all levels of patient care to promote positive health outcomes through prevention, early diagnosis, and prompt treatment. However, in Botswana, cancer services are centralised in four public referral hospitals, which serve as oncology centres, where the few oncology-trained personnel are deployed (Botswana Ministry of Health, Report 2020:14-16).

There are ten (10) nurses trained in oncology in Botswana for a population of over 2,3 million, of which two (2) are nurse educators, and eight (8) are distributed between the referral hospitals providing oncology care, with only four (4) Oncology Specialist doctors for public hospitals (Botswana Essential Health Services Package; BEHSP 2016:1-2). There are over 200 public clinics spread throughout the country (Botswana Ministry of Health 2020:14-16). This presents a serious shortage of oncology-trained nurses.

A shortage of skilled personnel in oncology was identified as a gap that might pose a challenge to the delivery of cancer services in primary healthcare clinics. Given the complexity of cancer as a disease, clients should be provided with individualised comprehensive care at all levels of healthcare, considering the physical and psycho-social well-being and continuous provision of information to clients and their caregivers. Given the resource constraints in cancer management within low- and middle-income countries, like Botswana, it is crucial to prioritize and efficiently target services to ensure equitable access to timely, high-quality cancer care (Iyer, Kohler, Ramogola-Masire, et al. 2019:14). Therefore, it was necessary to explore and describe the nurse's perceptions of healthcare services to cancer patients at primary healthcare clinics and get some feedback from recipients of services by assessing cancer patients' quality of life in relation to services provided in primary healthcare clinics. The nurses' views on cancer service delivery in their clinics and feedback from cancer patients on services in primary healthcare clinics collectively formed the basis for devel-

oping a programme expected to integrate, improve, and standardise services for cancer patients. The programme is expected to improve the quality of care and guide health authorities to pay attention across the entire cancer care pathways, and may ultimately reduce the current gap in the healthcare system.

The introduction, background and research problem gave rise to the following research questions:

- What are the perceptions of registered nurses regarding cancer service provision in Primary Healthcare Clinics?
- What are the cancer patients' outcomes regarding quality of life and services received in primary healthcare clinics?
- What cancer service delivery programs are available in primary healthcare settings in Africa and Botswana?
- What programmes are available for managing cancer care in primary healthcare clinics in Botswana?

1.4 RESEARCH PURPOSE

The purpose of the study was to develop a programme that guides cancer service delivery in Botswana's primary health care clinics.

1.5 RESEARCH OBJECTIVES

The study purpose was realised through the following objectives:

- To explore and describe the perceptions of nurses working in Botswana primary health care clinics regarding cancer management and care.
- To assess cancer patients' outcomes in relation to their quality of life and the health care services provided in the primary care clinic.
- To conduct a scoping review to identify programs and any gaps in cancer service provision at Primary Healthcare clinics.
- To develop and validate a program to support cancer care in Botswana primary healthcare clinics.

1.5.1 Hypothesis

The hypothesis for this study is in line with Objective 2 (quantitative strand)

- There is a significant relationship between the quality of health care services provided in primary healthcare clinics and cancer patients' outcomes and quality of life.

1.6 SIGNIFICANCE OF THE STUDY

The field of oncology in Botswana remains underdeveloped, with limited integration of cancer services at the primary healthcare (PHC) level. Existing evidence from sub-Saharan Africa indicates that weak primary care systems are associated with delayed cancer diagnosis, poor referral pathways, and suboptimal patient outcomes. In this context, the study represents one of the first systematic efforts to examine cancer service delivery within primary healthcare clinics in Botswana. The proposed programme is therefore designed to strengthen cancer care at the PHC level by identifying gaps in early detection, patient navigation, referral systems, and continuity of care. By generating context-specific evidence on service availability, provider capacity, and patient experiences, the programme can inform targeted interventions such as training of primary care providers, improved screening protocols, and strengthened referral linkages that are known to improve early diagnosis and treatment initiation. These improvements are causally linked to better clinical outcomes, as earlier detection and timely treatment significantly increase cancer survival rates. Furthermore, the study's findings may provide policymakers with empirically grounded insights into the current state of cancer service delivery in PHC settings, enabling evidence-based decision-making regarding resource allocation, guideline development, and health system strengthening. Establishing baseline data on service provision and patient experiences will also allow for ongoing monitoring and evaluation of cancer care interventions over time.

Ultimately, by addressing systemic gaps in primary care oncology services, this work is expected to contribute to improved quality of care, enhanced patient satisfaction, and increased cancer survivorship. In addition, the study fills a critical gap in the literature by foregrounding the perspectives of cancer patients within Botswana and the broader African context, where patient-centred data on cancer service delivery remain limited.

1.7 OPERATIONAL DEFINITION OF KEY CONCEPTS

Patient Outcomes: these are the results of health care and/or health care services that patients receive in a health facility; they include maintenance of functional status, maintenance of patient safety, and patient satisfaction (Hutchings et al. 2024:116).

Quality of Life: Refers to psychosocial and physical well-being that affects a person's health and, in turn, daily life (WHO 2023: 508).

Primary Healthcare Clinics: Commonly known as clinics, are the first level of contact for individuals, families, and the community with the national health care system, and they ensure that people receive quality Comprehensive care ranging from promotion, prevention, treatment, and rehabilitation (Botswana Health Policy 2023:15)

Cancer: A term for diseases in which abnormal cells divide without control and can invade nearby tissues. Cancer cells can also spread to other parts of the body through the blood and lymph systems (American Cancer Society 2024:24-26)

Programme: A planned series of activities or events designed to achieve specific objectives within a given timeframe

1.8 METHODS AND DESIGN

1.8.1 Research method

Research method is a rigorous and meticulous process of logically and systematically applying all steps, strategies, and procedures for collecting and analysing data in a research study as directed by the research (Brink, Van der Walt & Van Rensburg 2012:160). Since the researcher believes that multiple realities exist, this study adopted a mixed-methods approach, using different methods to guide the development of a programme for the management of cancer service delivery.

1.8.2 Study design

Research design is a plan and procedure for research that spans the decisions made during the research (Creswell & Plano-Clark 2018:5). The function of the research design is to enable the researcher to anticipate appropriate research decisions and develop findings that are precise, objective, and interpretable. The study employed a

convergent parallel mixed-methods design, in which both qualitative and quantitative data were collected simultaneously, weighed equally, and merged at the end to develop a programme to strengthen cancer care in primary health care clinics in Botswana.

Phase 1: Simultaneous data collection and analysis of qualitative and quantitative data in line with Objectives 1 and 2 of the study

This phase addresses Objective 1 (qualitative approach): exploring registered nurses' perceptions of cancer management in primary healthcare clinics. An interview guide was used to collect data to meet this objective, using a purposive sample of 32 registered nurses in focus group discussions. Thematic analysis by Braun and Clarke (2021: 26) was utilised for data analysis. For Objective 2 (quantitative approach), an assessment of cancer patients' outcomes and their quality of life in relation to health care services received in primary care clinics was conducted. In this approach, the researcher utilised the EuroQol EQ-5D questionnaire, which was adopted and adapted with permission from the EuroQol Research Foundation (Annexure 5) to collect data from a sample of 135 cancer patients to answer Objective 2, to assess cancer patients' quality of life and the outcomes of services received in primary healthcare clinics. SPSS version 27 was used to analyse the data, and both descriptive and inferential statistics were used to describe and assess the association between the study constructs. Then the results of the two approaches were integrated, compared, related, combined and discussed as one.

Phase 2: Scoping review on programmes guiding cancer service delivery

It was conducted to search for existing programmes on cancer service delivery in primary healthcare clinics, which is discussed in detail in Chapter 6.

Phase 3: Programme development and validation

To develop the programme, a conceptual framework was developed and followed. Dickoff, James, and Wiedenbach's (1968:434) survey list was used as a thinking map and served as the basis for formulating the conceptual framework, which eventually guided the programme's development. Then, the programme was validated by experts in the field, policymakers, and managers of primary healthcare clinics, the latter for

programme ownership. A programme was sent to this team of experts and policymakers to solicit their input on its relevance, Comprehensiveness, and feasibility.

1.8.3 Study setting

The study was conducted in Botswana, a middle-income country, and the Government funds 80% of the healthcare budget. Cancer service delivery is still at an infancy stage in Botswana, and specialist services are available only in 2 public referral hospitals, one in the southern part of the country and the other in the north, and 1 private hospital in the south. The country's healthcare delivery system is structured around the primary healthcare philosophy, which emphasises primary prevention of all diseases (communicable and non-communicable). Therefore, these levels place the referral hospitals at the apex. At the bottom are primary healthcare clinics, starting with mobile stops, clinics spread across the country (such as those in Kanye, Molepolole and Ramotswa, which are part of the study sites), district hospitals, and referral hospitals, the latter of which provides specialised cancer services. The clinics are staffed mainly with registered nurses. A visiting doctor is allocated on a rotational basis to some clinics and permanently to others, especially in towns and large villages. This is a summary of the Botswana public healthcare system.

Botswana has a population of 2.3million people (Central Statistics Office 2011; Sidandi, Opondo & Tidimane 2011:67). More than 60% of the country is a desert, and most people are concentrated in the southern, central, and northern parts.

Below is the map of Botswana showing study sites highlighted in green.

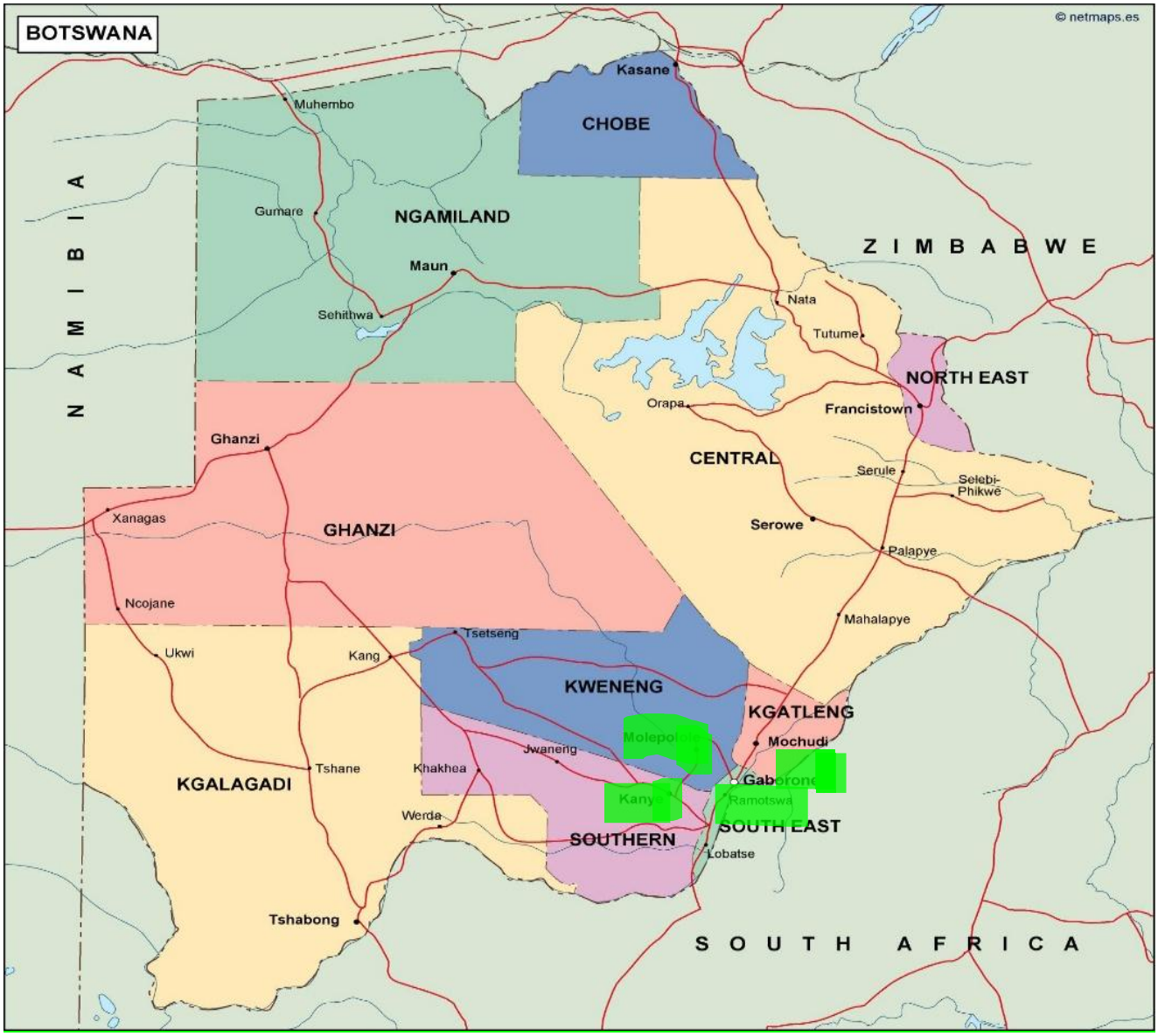


Figure 1.1: Map of Botswana indicating study sites (Legend: Study sites highlighted in green)

The study was conducted in primary healthcare clinics situated in Molepolole, Kanye, and Ramotswa and at the oncology clinic in Princess, all in the southern part of the country. Gaborone is the capital city, and the Princess Marina oncology clinic is based at a public referral hospital. Cancer patients in the southern region of the country are reviewed by the oncologist once a month, every two months, or every three months, depending on their condition. At the same time, they continue to receive other services at their local clinics in their villages or at the locations where they reside permanently. Princess Marina Oncology Clinic was used to identify cancer patients because it is the main treatment centre for cancer. All cancer patients treated at Princess Marina come

from all these areas in the southern part of Botswana for review by an oncologist. Through cancer patients' records, it was easy to identify the total number of cancer patients at the time of study; this is the total population of cancer patients from which the sample was determined. Important to note is that local clinics do not keep records of patients.

The number of clinics per study site is: Molepolole, there are 8 clinics and 97 registered nurses; in Kanye, 9 clinics and 98 registered nurses; and in Ramotswa, 3 clinics and 41 registered nurses. There are no social workers or psychologists allocated to the clinics, and patients can access them only on referral from the district hospitals in these villages. The three villages were chosen as study sites because they share characteristics of both urban and rural life, and all have the same number of primary healthcare clinics and are similarly resourced in terms of staffing and infrastructure.

The study employed a concurrent mixed-method design within three primary healthcare clinics located in large villages (Kanye, Molepolole, and Ramotswa). These settings were purposively selected because they provide cancer-related services and allow access to both healthcare providers and patients within the same service delivery context. The Oncology clinic in Princess Marina Hospital provides specialised cancer care; this site was used to identify cancer patients, and interviews were conducted on services provided in primary healthcare clinics.

The concurrent mixed-method design enabled the simultaneous collection of qualitative and quantitative data from two populations: nurses and cancer patients. Nurses contributed data on their perceptions of cancer service delivery, providing insights into service provision, challenges, and system-level factors. Cancer patients, on the other hand, provided data on the services they received, reflecting access, quality, and responsiveness of care.

The selection of these clinics created a shared service delivery environment where both providers and users of cancer services could be studied concurrently. This facilitated triangulation of data by allowing comparison between nurses' reported practices and patients' actual experiences. Such a design ensured complementarity, where qualitative insights from nurses enriched the understanding of quantitative and experiential data obtained from patients. Furthermore, the integration of data occurred at

the analysis stage, where findings from both groups were compared for convergence, divergence, and complementarity.

1.8.4 Population and Sampling

This section describes the study population, sampling procedure, sampling criteria, sample, and sample size.

1.8.4.1 Population

A study population refers to the entire group of people who meet the criteria under investigation (Brink et al. 2012:116; Polit & Beck 2021:250). For this study, the target population were registered nurses working at Primary health care clinics and cancer patients utilising those clinics while on home care. Below is a brief description of the population according to the two research approaches, all for Phase 1.

Qualitative approach

The Phase 1 qualitative population comprised all registered nurses working in primary care clinics in Molepolole, Kanye, and Ramotswa. The sample consisted of 32 nurses, purposively selected and meeting the inclusion criteria.

Quantitative approach

The population in this approach consisted of all cancer patients registered at the oncology clinic at Princess Marina Hospital in Gaborone. All Cancer patients, after being stabilised on treatment, are discharged from the Princess Marina oncology unit and are to be managed at local clinics/primary healthcare clinics, depending on the treatment plan. At the time of data collection, 320 cancer patients were registered for review at the Princess Marina Oncology Clinic. These became the population of cancer patients from which the sample of 135 was drawn.

1.8.4.2 Sampling

Sampling is the process of selecting cases to represent the entire population to permit inferences about the population (Polit and Beck 2021:250). All nurses and cancer patients at the study sites who met the inclusion criteria and were available at the time of data collection were eligible for potential inclusion in the study. According to Brink

et al. (2012:117), “a sample is a fraction or a part of a whole that a researcher selects. “It is a small number of items, objects, or a group of people taken from an entire population for measurement (Bhardwaj 2021:158). To select a sample, a sampling procedure is used. Sampling is the process of selecting a sample for a particular study. For the qualitative phase of this study, purposive sampling was used to select nurses who met the inclusion criteria and were available at the time of data collection. They were believed to have information on managing cancer patients and the services provided in their clinics.

In a quantitative approach, a RAOSOFT calculator was used to determine the sample size, and convenience sampling was used to select cancer patients who met the inclusion criteria to participate in this study. The reason for using convenience sampling is that, with patients, there is no certainty that they will turn up, whilst also being readily available, and some come in very sick or in severe pain or psychologically distressed because of the condition or other social issues. In Phase 3, the programme involved programme development and validation, using purposive sampling to select the experts in oncology, policy makers, managers of primary healthcare clinics and community health nurses to validate the programme.

1.8.4.3 Sample size

A Sample size is a smaller proportion of the targeted population, and researchers strive to select a representative sample in quantitative research (Brink et al. 2012:129; Brink & Van Rensburg 2022:80). For Phase 1; the qualitative part of the study in Phase 1, a focus group consisting of 10 to 12 were selected in each study site for nurses and there were 3 focus group one per study site.

In the quantitative approach, a RAOSOFT sample size calculator software was used to calculate the sample size for cancer patients. The entire population of cancer patients was 320 (registered at the oncology clinic). Based on the confidence level of 95% and margin of error of 5%, the sample size for cancer patients was 175, but ended up interviewing 135. The shortfall was attributed to several practical, clinical, and ethical challenges encountered during data collection. A number of patients became emotionally distressed when discussing their illness and personal experiences, leading to the discontinuation of interviews in order to uphold ethical research stand-

ards and safeguard participant well-being, and an arrangement was made. Additionally, some patients were too physically unwell to participate fully due to the severity of their condition, treatment side effects such as fatigue, pain, or weakness, and general clinical instability.

Other contributing factors included reluctance to participate due to the sensitive nature of cancer-related discussions, as well as anxiety, fear, or stigma associated with the disease. Time constraints during clinic visits also limited participation, as some patients had to attend multiple service points or were called for consultations, procedures, or treatments before interviews could be completed. In some cases, patients withdrew consent either before or during the interview process. Logistical challenges such as long waiting times, transportation constraints, and the need for patients to return home early further reduced participation. Additionally, some eligible patients were accompanied by caregivers who declined participation on their behalf due to concerns about fatigue or emotional burden.

In Phase 3, program development and validation, 12 experts were purposively selected to validate the programme for relevance, comprehensiveness, and feasibility.

The summary of the phases, research method, and design is presented in Table 1.1

Table 1.1: Summary of research methods and design for the study

Research methodology	**Phase 1: Simultaneous data collection and analysis**		**Phase 2: Scoping review**	**Phase 3: Programme development and validation**
Design	Qualitative exploratory and descriptive research design	Quantitative descriptive cross-sectional survey	Scoping review on cancer service delivery programmes	Programme development and validation
Context	Primary healthcare clinics (Molepolole, Kanye, and Ramotswa) in the southern part of Botswana	Primary healthcare clinics (Molepolole, Kanye, and Ramotswa) in the southern part of Botswana	SADC and Africa as a whole	Botswana primary healthcare clinics
Population	Registered nurses working in primary healthcare clinics	Cancer patients receiving services in primary healthcare clinics	Relevant studies, already published, to answer the research question.	Experts in oncology, managers of primary healthcare clinics, policy makers, and community health nurses
Sampling method	Purposive	Convenience sampling	Mixed Methods Appraisal Tool (MMAT) version 2018	Purposive
Sample size	n = 32 Based on saturation	n = 135	n = 4	n = 12
Data collection methods	Focus groups	Interviews	Mixed Methods Appraisal Tool (MMAT) version 2018	Dickoff et al. (1968) survey list used to develop the conceptual framework that

				guided the development of the programme
Instrument	Interview guide	Questionnaire (EuroQol EQ-5D)	Arksey & O'Malley (2005) guidelines	Dickoff et al. (1968) survey list and e-Delphi for programme validation
Data Analysis	Thematic data analysis was employed using the Braun and Clarke (2019) process	Statistical Package for the Social Sciences (SPSS) version 27.Further analysis: Structural Equation Modelling was used to ascertain the collective relationship between variables	Arksey & O'Malley (2005) guidelines	e-Delphi was used to validate the programme

1.9 PARADIGMATIC PERSPECTIVE

The paradigm in this study is pragmatism. Pragmatism is a research paradigm that emphasises practical solutions to real-world problems rather than adhering strictly to a single philosophical stance (such as positivism or interpretivism). It focuses on "what works" in a particular context and values both qualitative and quantitative approaches, which complement each other to help answer the research question. It emphasises the use of research approaches that best address the research question. Pragmatism is particularly appropriate for health systems research, where the goal is not only to generate knowledge but also to inform actionable improvements in service delivery. This allows the integration of both quantitative and qualitative approaches. In this study, such integration is essential because examining cancer service delivery in primary healthcare clinics requires both objective assessment of service availability, efficiency, and outcomes, as well as subjective exploration of patient experiences and healthcare provider perspectives. This justifies the use of a mixed-methods approach.

In this mixed methods study, the researcher believed that exploring the perceptions of non-oncology trained registered nurses working in primary healthcare clinics regarding cancer services provided in their facilities and then obtaining some form of feedback from cancer patients about the services received from these clinics it may bring about a workable solution towards improving cancer service delivery and this makes this paradigm problem centred, hence it situates the study very well.

A key principle of pragmatism is that knowledge is validated by its usefulness in practice. This aligns directly with the purpose of the study, which is to generate evidence that can guide policymakers and improve cancer service delivery in Botswana's primary healthcare clinics. The study therefore focuses on identifying contextually relevant and implementable solutions that can strengthen early detection, referral systems, and continuity of care.

A pragmatic paradigm allows for exploration of multiple factors affecting cancer patient outcomes and survivorship, such as emotional aspects, lifestyle factors, characteristics of treatment, health care services, health state of the patient and social support and material context, through the use of a structured questionnaire (for cancer patients) and an interview guide (for nurses). The paradigmatic perspectives for this study are meta-theoretical, theoretical, and methodological assumptions, as discussed below.

1.9.1 Meta-theoretic assumptions

The researcher's view of reality influenced the meta-theoretical assumptions of this research. The researcher's view of reality is discussed under ontology, epistemology, and methodology, and they influence what researchers consider valid evidence or acceptable explanations.

Ontology: This is the objective reality of how the researcher views reality (Polit & Beck 2017:9; Polit & Beck 2021: 25). The researcher believes that reality is subject to many interpretations. However, the aim is to understand reality and meaning within the specific research setting. Therefore, in conducting this study, the researcher used a mixed-methods approach to establish reality as it exists in the world.

Epistemology: This explains how the researcher relates to participants in the process of knowing and understanding reality (Polit & Beck 2021:30). The researcher holds the view that reality is both observable and subject to interpretation. Therefore, to conclude what reality is, it is important to use different research approaches. The researcher interacted with participants in their settings as they described cancer service delivery in primary care clinics, with registered nurses as providers and cancer patients as recipients.

1.10 ETHICAL CONSIDERATIONS

Data were collected once the study received ethical clearance (Annexure 1) from the University of South Africa, Botswana Ministry of Health Ethics Review Board (Annexure 2), and after permission was sought from gatekeepers and managers of primary healthcare clinics where the study was conducted (Annexure 3). Lastly, consent was sought from participants. All ethical principles about participants, such as autonomy, confidentiality, and the ability to discuss unclear issues, were observed and are discussed in detail in Chapter 3. Aspects about validity, reliability and rigour of the study are also discussed in Chapter 3.

1.11 CHAPTER OUTLINE AND SUMMARY

Chapter 1: Introduction, background, and rationale for the study.

Chapter 2: Literature review about the burden of cancer, its impact, the risk factors for developing cancer, determinants of health, cancer incidence, and the management of cancer.

Chapter 3: Research methods and design guiding the study.

Chapter 4: Results and findings of the study (qualitative & quantitative).

Chapter 5: Discussion of findings of the study.

Chapter 6: Scoping review of programmes for management of cancer in primary healthcare settings.

Chapter 7: Programme development and validation.

Chapter 8: Conclusion.

1.12 CHAPTER SUMMARY

Chapter 1 discussed the background and overview of cancer. An outline of the paradigm guiding the study, as well as the research design and methods, was discussed. The study's phases were also presented. Chapter 2 will discuss literature on the global burden of cancer, its impact on the individual and family, and challenges faced by low- and middle-income countries in managing cancer. The theoretical framework guiding the study will also be discussed.

CHAPTER 2: LITERATURE REVIEW

2.1 INTRODUCTION

This chapter presents the reviewed literature about the burden of cancer, its impact, the risk factors for developing cancer, determinants of health, cancer incidence and management of cancer. The purpose of this literature review is to lay a foundation for the study and to identify gaps in prior research on similar topics.

The literature search was conducted through databases such as Academic Search Premier, CINAHL, MEDLINE, PubMed, Google Scholar, and ProQuest, as well as the websites of organisations such as GLOBOCAN, the World Health Organisation, and various cancer registries. The search was further narrowed by time, and only full-text articles within the custom range of 2017-2023 were used. The keywords that guided the search were supported by the Boolean operator “AND’’ and included “cancer care AND burden of cancer”, “impact of cancer AND management of cancer”, “cancer service delivery AND cancer care pathways”, “programme for cancer AND guidelines for cancer care” and “quality of life AND treatment”. The literature review is guided and arranged according to study objectives and some related concepts of the conceptual framework: burden of cancer, impact of cancer and management of cancer

2.1.1 Global burden of cancer

Cancer is a serious health problem worldwide. It is a disease in which some of the cells grow uncontrollably and spread to other parts of the body. The top 10 cancer types account for 60% of the newly diagnosed cancers and 70% of deaths in 2020 (Sung et al. 2021:4). The cancer incidence rate has increased worldwide, making it the second leading cause of death after cardiovascular diseases. 18.1 million people around the world had cancer, and 9.6 million died from the disease (WHO Cancer Report 2020). It is estimated that by 2040, these figures will nearly double, with the greatest increase in low- and middle-income countries, where more than two-thirds of the world's cancers will occur. Cancer is the cause of about 30% of all premature deaths from NCDs among adults aged 30-69 years (WHO 2020).

According to Ferlay, Colombet, Soerjomataram et al. (2018:1950), lung cancer is the most frequently diagnosed cancer (11.6% of all cases), followed by female breast cancer (11.6%) and colorectal cancer (10.2%). Lung cancer is the leading cause of death (18.4% of all deaths), followed by colorectal (9.2%) and stomach cancers (8.2%). The most common cancer type varies among countries, with certain cancers, such as cervical cancer and Kaposi sarcoma, much more common in countries at the lower end of the human development index (HDI) than in high-HDI countries (Bahnassy, Abdellateif, & Zekri 2020:6). Stelzle, Dominik, Tanaka et al. (2020: 112-118) report that cervical cancer is the fourth most common cancer in women worldwide, with approximately 660,000 new cases and 350,000 deaths in 2022. In terms of proportion among female cancers, it ranks behind breast, colorectal, and lung cancers, but ahead of many others. It represents roughly 6-7% of all female cancer cases globally (Anandasabapathy, Asirwa, Grover et al. 2024:167-170).

To qualify as a common cancer, the estimated annual incidence for 2024 had to be 40,000 cases or more (National Cancer Institute 2024:20). Based on this list for common cancers globally, breast cancer with 313 510 cases is expected in the United States of America in 2024 (NCI 2024:20). The rest are bladder cancer, colorectal cancer, endometrial cancer, lung cancer, prostate cancer, pancreatic cancer, non-Hodgkin lymphoma, melanoma, thyroid cancer, leukaemia, liver, and kidney cancers (NCI 2024:20). These are also among the list of common cancers in the UK (Cancer Research UK 2018:10). In Europe, the most common cancers are breast in women (530,000 cases), colorectum (520,000), lung (480,000) and prostate (470,000). These four cancers account for half the overall cancer burden in Europe. In South, East, Eastern and Southeastern Asia, excluding non-melanoma skin cancer, the common cancers accounted for 8.2 million cases and 5.2 million deaths in 2018 (The Cancer Atlas 2018:1).

However, there has been much greater progress in reducing the probability of premature deaths from cancer among high-income countries (HICs), with a 20% reduction from 2000 to 2015 (Bahnassy et al. 2020:6). Anandasabapathy et al. (2024:167-170) indicate that global cancer deaths occur mostly in LMICs, even though incidence is higher in high-income countries (HICs). This is due to late diagnosis and limited access to treatment. Furthermore, Kaur, Modi, Bhimineni, and Kozyreva (2025) purport that

cancer cases in LMICs are expected to rise by 73% by 2030, driven by ageing populations, urbanisation, and lifestyle changes.

2.1.2 Burden of cancer in Africa

Most countries in Africa fall in the low- and middle-income category and are rated as being on the lower end of the Human Development Index, and this is where the majority of premature deaths from cancer occur, because of lack of resources (You & Haneberg 2018:145). According to Ferlay, Ervik, Lam et al. (2020), Africa recorded about 1.18 million new cancer cases and 763,843 deaths in 2022**.** There were 820,000 new cases and 550,000 deaths in 2022 in sub-Saharan Africa, and without urgent intervention, annual cancer deaths could reach 1 million by 2030 (The Cancer Atlas 2024).

Northern and Southern Africa are reported to have cancer incidence and mortality rates similar to those of other African regions (Hamdi, Abdeljaoued-Tej, Zatchi et al. 2021:1-19). The second most diagnosed cancer and the leading cause of cancer death among women in sub-Saharan Africa is cervical cancer. GLOBOCAN / IARC (2025) indicate that Africa accounts for 23% of global cervical cancer deaths**,** with over 72,000 women dying annually.

According to GLOBOCAN (2022), the most prevalent cancers in Africa are breast, bladder, and liver cancers in Northern Africa; prostate, lung, and colorectal cancers in Southern Africa; and oesophageal and cervical cancer in East Africa. Further, Bray, Ferlay et al. (2020:424) reported that in Southern Africa, fatality rates from prostate cancer, breast cancer, and cervical cancer have increased. In sub-Saharan Africa, cervical cancer accounts for more than 75,000 new cases and 50,000 deaths yearly, and this is further compounded by HIV infection (Mboumba Bouassa, Prazuck, Lethu et al. 2017:101-110). By the year 2030, cervical cancer is projected to kill more than 443,000 women yearly worldwide, most of them in sub-Saharan Africa (Mboumba Bouassa et al. 2017:620; Mboumba-Mboumba 2025:260).

2.1.3 Burden of cancer in Botswana

The rising Global Burden of cancer and other NCDs and their risk factors is also reflected locally in Botswana (Botswana Ministry of Health Report on NCDs 2021:20).

Botswana, like other countries in sub-Saharan Africa, is experiencing a surge in cancer and many deaths resulting from inequity in access and effective management. Cancer accounted for 7% of all deaths in Botswana as at 2016 (WHO NCDs Country Profile 2020: 20).

According to the population-based Botswana National Cancer Registry (2023), there are 2317 cancer cases, 1277 deaths, and a 5-year prevalence of 6644 cases, and these numbers are expected to double by 2040 (GLOBOCAN 2022). The most common cancers among women in Botswana are cervical cancer 19.4%, breast cancer 11.1%, and Kaposi's 10%, and for men, the common cancers are prostate 16.9%, Kaposi's sarcoma 14.2%, and oesophagus 9.8% (National Cancer Registry 2023). Cancer impacts the socio-economic status of individuals diagnosed with cancer because of healthcare costs: Cancer treatment requires specialised facilities and trained personnel, which Botswana struggles to provide.

This results in high referral costs abroad and strains the public health budget (Heyes 2025). Furthermore, cancer affects working-age adults, thus reducing labour productivity and increasing dependency ratios. With a 27.6% unemployment rate in Botswana, this further pushes down the economic situation at the individual level for individuals diagnosed with cancer, their family, community, and national levels. Survivors of non-metastatic breast cancer reported long-term pain, mobility restrictions, fatigue, and financial stress after mastectomy. Psychological issues such as depression, anxiety, and body image concerns were common, compounded by stigma and limited access to support services (McLouth, Ford, Pustejovsky et al. 2021).

Structural barriers, such as a lack of symptom management, negatively impacted patients' overall well-being, resulting in poor health outcomes, loss of productivity, and, eventually, job or business loss, depending on the type of employment or income-generating activities cancer patients are engaged in. If the person with cancer is a breadwinner, as is the situation in most instances, the whole family suffers, leading to a lack of basic needs.

The management of cancer, including treatment, is expensive, posing a challenge due to the long-term nature of treatment and limited resources in low- and middle-income countries such as Botswana, where there are always more competing demands on

the national budget (Botswana Ministry of Health 2022). According to Sung et al. (2021:4), many health systems in low- and middle-income countries are least prepared to manage this burden, and globally large numbers of cancer patients do not have access to timely, quality diagnosis and treatment; this is the situation in Botswana.

Sung et al. (2021:4) highlight that many health systems in low- and middle-income countries are inadequately prepared to manage the growing burden of cancer. This is reflected in limited infrastructure, insufficient human resources, and constrained access to diagnostic and treatment services. Consequently, a significant proportion of cancer patients globally experience delays in diagnosis and are unable to access timely and quality care.

While this global perspective provides an important framework for understanding cancer care challenges, its direct applicability to Botswana requires contextual consideration. Botswana has made notable progress in strengthening its healthcare system; however, disparities in cancer service delivery persist, particularly at the primary healthcare level. Challenges such as limited screening services, delayed referrals, and resource constraints suggest that Botswana exhibits characteristics consistent with the broader trends described by Sung et al. (2021).

Nonetheless, the generalisation of global findings to Botswana may overlook context-specific factors, such as national health policies, existing cancer control programmes, and ongoing efforts to decentralise services. Therefore, there is a need for localised evidence to fully understand how these global challenges manifest within Botswana's primary healthcare system. This underscores the importance of the current study, which seeks to generate context-specific insights to inform the development of a tailored programme for cancer service delivery.

Accordingly, more than 360,000 people are living with HIV and AIDS in Botswana, and among those, cancer accounts for nearly a quarter of deaths and will surpass AIDS illnesses as the leading cause of death (Dryden-Peterson, Medhin, Kebabonye et al. 2015:1371). Accordingly, as the incidence of some AIDS-defining cancers (ADC) has dropped immensely with the use of combination antiretroviral therapy, the risk of many non-AIDS-defining cancers has increased (Dryden-Peterson et al. 2015:1371). In sub-Saharan Africa, where more than two-thirds of all HIV infections occur, there is limited

knowledge of trends in cancer incidence, and cases are expected to increase by 70% in 2030 (Dryden-Peterson et al. 2015:1371).

Dryden-Peterson et al. (2015:1371) highlight the significant and evolving burden of cancer in Botswana within the context of a high HIV prevalence. With more than 360,000 people living with HIV and AIDS, cancer has emerged as a major contributor to mortality, accounting for nearly a quarter of deaths and projected to surpass AIDS-related illnesses as the leading cause of death. This reflects a critical epidemiological transition in which HIV is increasingly managed as a chronic condition due to the widespread use of combination antiretroviral therapy (cART).

In comparison to earlier phases of the HIV epidemic, where AIDS-defining cancers (ADCs) such as Kaposi's sarcoma were predominant, the introduction of cART has significantly reduced the incidence of these malignancies. However, this progress has been accompanied by a rise in non-AIDS-defining cancers (NADCs), highlighting a shift in disease patterns among people living with HIV. This suggests that prolonged survival due to effective HIV treatment exposes individuals to age-related, lifestyle-related, and infection-associated cancers, thereby increasing overall cancer risk.

Within the broader sub-Saharan African context, where over two-thirds of global HIV infections are concentrated, the situation is further complicated by limited surveillance systems and insufficient cancer registries. As noted by Dryden-Peterson et al. (2015), there remains inadequate data on cancer incidence trends, which limits effective planning and resource allocation. Nevertheless, projections indicating a potential 70% increase in cancer cases by 2030 underscore an impending public health challenge that necessitates urgent attention.

Critically, while these findings provide valuable insight into the regional burden of cancer, they also reveal important gaps. The reliance on limited data sources may obscure the true magnitude and distribution of cancer within different populations and healthcare settings. Furthermore, the generalisation of regional projections may not fully capture country-specific variations in healthcare infrastructure, policy responses, and service delivery capacity. In Botswana, although significant strides have been made in HIV management, the health system may not yet be adequately

equipped to respond to the growing dual burden of HIV and cancer, particularly at the primary healthcare level.

Overall, the evidence points to a complex interaction between HIV and cancer, characterised by both epidemiological transition and health system challenges. This underscores the need for context-specific research to better understand how these trends manifest at the local level and to inform integrated approaches to cancer prevention, diagnosis, and treatment within HIV care services.

Currently, over 80% of cervical cancer patients in Botswana are HIV-positive (Botswana-Uppen Partnership Report on Cervical Cancer 2020). The WHO Report on Cancer (2020) posits that tailored strategies should be developed to ensure equitable access to Comprehensive, high-quality services with financial protection for all people. Akachi and Kruk (2017:469), in their study on Quality of care: measuring a neglected driver of improved health, recommend the need to get the patients' perspectives on quality of care provided, especially at points of entry, which in Botswana are primary healthcare clinics, and that is where prompt action should be taken for thorough investigations.

According to the Botswana Ministry of Health Report (2022), the growing scourge of cancer and other non-communicable diseases presents a challenge for Botswana. Botswana's approach to the fight against cancer emphasises prevention, leveraging the primary care platform to focus on early detection and to link affected individuals to high-quality care. Hence, this study aimed to close the gap along the cancer management pathway in Botswana by developing a programme to facilitate cancer management in Primary Healthcare clinics.

2.2 IMPACT OF CANCER

The burden of cancer and other NCDs is becoming a major barrier to development. To the achievement of SDG# 3 (Good Health & Wellbeing), cancer is contributing to poverty at different levels of socio-economic development because of loss of productivity and family income in low- and middle-income countries (Boudreaux, Noble, Coates et al. 2020:1). Cancer can also impact individuals and families. Nemutlu, Mercaldo, Thayumanavan et al. (2025), in their study on forecasting global progress in breast cancer control in the context of the Sustainable Development Goals, indicated

that it is aligned to SDG 3, which addresses Good Health and Well-Being, specifically Target 3.4 on reducing premature mortality from NCDs (including cancer) by one-third by 2030.

However, many countries are off-track, especially LMICs, due to limited access to screening, diagnosis, and treatment. GLOBOCON (2022) and Grassi (2020: 112) report that from 2020 to 2030, breast cancer mortality is projected to increase by 22.8% and 7.8% in low- and middle-income countries, respectively, while decreasing by 10% and 5.4% in upper-middle- and high-income countries, respectively. Nemutlu, Mercaldo, Thayumanavan et al. (2025:223-228), in a study on forecasting global progress in breast cancer control in the context of the Sustainable Development Goals, also identify significant challenges to achieving SDG 3 due to NCDs, particularly cancer, in resource-limited settings. Nemutlu, Mercaldo, Thayumanavan et al. (2025:223–228) examine global progress toward breast cancer control within the framework of the Sustainable Development Goals (SDGs), particularly SDG 3, which aims to ensure healthy lives and promote well-being for all. The authors identify significant challenges to achieving this goal, especially in relation to non-communicable diseases (NCDs) such as cancer in resource-limited settings. These challenges include inadequate healthcare infrastructure, limited access to early detection and treatment services, and disparities in resource allocation between high-income and low- and middle-income countries.

In comparison to broader global cancer literature, Nemutlu et al. (2025) reinforce existing evidence that resource constraints remain a major barrier to effective cancer control. Similar to findings by Sung et al. (2021), the study highlights disparities in healthcare system capacity, particularly in low- and middle-income countries where health systems are often overstretched. However, Nemutlu et al. provide a more focused analysis on breast cancer, emphasising the need for targeted interventions, including screening, early diagnosis, and treatment accessibility.

Furthermore, when compared to Dryden-Peterson et al. (2015), who focus on the intersection of HIV and cancer in sub-Saharan Africa, Nemutlu et al. extend the discussion by situating cancer within a broader global development agenda. While Dryden-Peterson et al. emphasise epidemiological transitions and the dual burden of

disease, Nemutlu et al. frame cancer control as a critical component of achieving international development targets. This comparison highlights how cancer is not only a health issue but also a development challenge linked to health system strengthening and equity.

Critically, although Nemutlu et al. (2025) provide valuable insights into global breast cancer control, their emphasis on macro-level indicators and global projections may overlook context-specific realities at the country level. Resource-limited settings, such as Botswana, may experience unique challenges related to workforce shortages, decentralisation of services, and integration of cancer care into primary healthcare systems. The generalisation of global trends may therefore obscure important local variations in service delivery and access.

Moreover, the focus on breast cancer, while important, may limit the broader applicability of the findings to other cancer types that contribute significantly to the disease burden in different contexts. This suggests the need for more comprehensive, context-specific research that includes multiple cancer types and examines health system responsiveness at different levels of care.

Overall, the study by Nemutlu et al. (2025) contributes to the growing body of literature that underscores the challenges of achieving SDG 3 in the face of rising NCDs. When synthesised with other studies, it becomes evident that while global frameworks provide useful direction, there remains a critical need for localised evidence to inform contextually appropriate interventions. This reinforces the importance of studies that explore cancer service delivery within specific healthcare settings to support tailored and effective programme development.

2.2.1 Impact of cancer on the individual

2.2.1.1 Social & Emotional Impacts of Cancer

Most cancer patients and survivors face psychological and emotional issues from the time of diagnosis and can still experience those many years after treatment. Socially, cancer patients often experience isolation and loneliness as social circles start shrinking and friends and relatives withdraw (OSHU Knight Cancer Institute 2024).

According to MD Anderson Cancer Centre (2025), a diagnosis of cancer can affect family relations and dynamics, with friends and coworkers who may receive different treatment from loved ones, and this leads to relationship strain. Wang and Feng (2022: 124), in a study on cancer-related psychological challenges, report that treatment costs and inability to work can create financial strain, adding to emotional distress. Cancer may profoundly change a patient's body appearance and function. Wang and Feng (2022:124) further indicated that during different treatment stages, for instance, surgical interventions, chemotherapy, radiotherapy, and drug use (Brunet, Price & Harris 2022:220), these changes may increase. This could result in scarring, hair loss, alterations in body shape, and other temporary or permanent consequences (Sun, Ang, Ang WHD et al. 2018: 130-139). Chopra and Lacourt (2021:118) purport that fear of change in one's body image begins before surgery or other treatments, and a serious concern about this change is detrimental to patients' quality of life and may result in depression, anxiety, and overall psychological distress. Other issues which cancer patients and survivors may deal with are:

Fatigue**:** Cancer fatigue is described as an intense exhaustion which is usually more severe than ordinary fatigue (Wang & Feng 2022:35). In some patients, the fatigue can be mild. In extreme cases, patients may struggle to carry on with day-to-day activities. It is a very common cancer symptom; therefore, it is important to talk about it and how to minimise the impact it has on patients' quality of life. Other conditions that can cause cancer fatigue include chemotherapy-induced anaemia, pain, depression or emotional distress, insomnia, and alterations to thyroid and other hormone levels (Sun, Ang, Ang et al. 2018:376-85). Other causes can include aggressive surgery, chemotherapy, immunotherapy, or radiation treatments. Complications from pre-existing medical conditions, such as uncontrolled diabetes, thyroid problems, heart disease or rheumatoid arthritis, sleep disorders, cytokine reaction, poor nutrition, chronic respiratory illness, and autoimmune disorders (National Cancer Institute 2024:20) can be increased. As to how long it lasts, for some patients, it is reported to get worse towards the end of chemotherapy/radiation treatment.

2.2.1.2 *Pain*

Pain is one of the most common and distressing physiological problems experienced by patients with cancer. It significantly affects quality of life, functional status, and psychological wellbeing (National Cancer Institute, 2025). Pain in cancer patients is complex and multifactorial, arising from the tumour itself, cancer treatments, and associated comorbidities. The prevalence of cancer-related pain is high, with studies showing that more than 50% of cancer patients experience pain at some stage of their illness, and this figure rises to over 60% in those with advanced disease (van den Beuken-van Everdingen et al., 2017). In many cases, the pain is moderate to severe, indicating a substantial physiological burden on patients.

From a physiological perspective, cancer pain can be classified into nociceptive and neuropathic pain. Nociceptive pain arises from tissue damage caused by tumour invasion into bones, soft tissues, or organs. This type of pain may be somatic or visceral in nature. Neuropathic pain, on the other hand, results from damage to the nervous system due to tumour compression, infiltration, or treatment-related injury such as chemotherapy-induced neuropathy (Carver and Foley, 2019:50). The pathophysiology of cancer pain involves complex interactions between tumour cells, the immune system, and the nervous system. Tumours can release chemical mediators such as prostaglandins, bradykinin, and cytokines, which sensitise nociceptors and enhance pain perception. Additionally, mechanical compression of tissues and nerves contributes to the activation of pain pathways (Haroun, Wood and Sikandar, 2022: 119-122). Cancer treatments themselves also contribute significantly to pain. Surgical procedures can result in acute and chronic postoperative pain, while chemotherapy and radiotherapy may lead to mucositis, neuropathy, and inflammatory responses that exacerbate pain. These treatment-related pains add to the overall physiological burden experienced by patients (National Cancer Institute, 2025).

2.2.1.3 Fear of death or recurrence

Many cancer patients and survivors worry that they may not recover from cancer or that it may recur at some point if they do recover. Knowing one's own body can help distinguish between normal physical changes and more serious symptoms that require reporting to healthcare workers or a doctor (Chopra & Lacourt 2021:130-1).

2.2.1.4 Grief

This is a natural result of loss. Loss can include one's health, sex drive, fertility, and physical independence (Ejaz, Maqbool, Malik et al. 2021: 70-78). Supporting cancer patients involves emotional, practical, social, and medical navigation support (National Cancer Institute, 2020). Different support mechanisms, such as counselling for patients and the family, local support groups, online communities for specific cancer types, faith-based support, and peer mentor programs where survivors support those newly diagnosed, can immensely assist patients and family work through various types of loss.

2.2.1.5 Depression

It is estimated that 70% of cancer patients and survivors experience depression at some point. They must be informed about the symptoms of depression in order to seek treatment as soon as possible (Chopra and Lacourt 2021:130-1). If they are in rural communities, the first point of entry is the primary healthcare clinic, as is the case in Botswana. The contact numbers should be made available to patients, survivors, and caregivers to call as and when needed.

2.2.1.6 Body-image

Cancer patients may have fungated wounds in the affected body parts, which seriously affects their body image (Wang and Feng 2022:35). Survivors who have experienced amputations, disfigurement or a major change in physical function can suffer from a lack of self-esteem. A negative body image can affect one's desire for intimacy and social interaction, and honesty and open communication with loved ones can minimise negative feelings (Kolodziejski and Pawłowski 2019:20).

2.2.1.7 Relationships

Patients may find that friends, coworkers, and family members treat them differently after a cancer diagnosis. They may avoid them or choose not to discuss the patient's condition. Under such circumstances, patients may seek new relationships with other cancer survivors who know about the cancer journey and have been through it (National Cancer Institute 2020).

2.2.1.8 The workplace

Cancer patients or survivors often feel that they can no longer relate to co-workers who have not experienced cancer (American Cancer Society 2023). They may be reluctant to talk about cancer treatment to employers or coworkers for fear of being treated differently. It is important to establish whether the workplace has a support group or other resources for cancer survivors. One can be motivated to start a workplace support group.

2.3 IMPACT ON THE FAMILY

Once a family member is diagnosed with cancer, it also affects family and friends. The family and friends may feel worried, angry, or afraid. The family may be supportive or start acting differently towards a cancer patient. Some may feel helpless, unsure how to help the patient (National Cancer Institute, 2020). Because caregivers are often intimate family members or friends, they often experience caregiver burden. It is noteworthy that the disease may also induce psychological distress for them that is almost similar to that of the patients. Geng, Chuang, Yang et al. (2018:1001-1008) in their systematic review reported that the prevalence of depression and anxiety among cancer patient caregivers accounted for 42.3% and 46.6%, respectively. Another meta-analysis revealed that caregiver stress may result in psychological and sleep disturbances and changes in physical health, such as somatic problems, fatigue, and insomnia, and negatively impact immune function. These conditions could be ameliorated through appropriate interventions that improve caregivers' coping skills, knowledge, and quality of life (Wang & Feng 2022:58). Therefore, the cancer patient and the caregiver need to be supported through ongoing education about the condition and counselling. They should have access to spiritual care if they so wish. Open communication is very important. Material and financial support is very important to the family.

2.3.1 Adjustment to the new situation

After the patient has gone through the roller coaster of emotions, they must face reality and start accepting the diagnosis of cancer so that they understand and accept information about the condition and treatment plans. Patients who achieve emotional sta-

bility and acceptance are more likely to follow treatment plans consistently, attend appointments, and adhere to medication schedules. Poor adjustment marked by denial or severe anxiety can lead to missed treatments or delays, reducing effectiveness.

In most cases, a diagnosis of cancer, especially if identified late, implies that daily routines may change for everyone (National Cancer Institute 2020). Schedules may be focused on treatment. Family members may step in to assist the client with activities of daily living. In most cases, family members assume roles previously performed by the patient. For example, the children may take up more household chores. There may be a need for the patient to change living arrangements and move to someone who can provide care. A patient should let some friends and family know how they could assist, because they may not find it easy to ask (National Cancer Institute 2020).

Some family members may fail to stay positive and cohesive during treatment and its side effects. This usually takes a toll on the family's emotional well-being (National Cancer Institute 2020).

Adjustment often involves accepting help from family, friends, or support groups. Strong social networks reduce isolation, improve motivation, and enhance rehabilitation efforts like physiotherapy or occupational therapy (Webb, Murray, Younger et al. 2021:899-908).

2.4 CANCER MANAGEMENT

2.4.1 Types of Treatment

Cancer management involves a Comprehensive approach that combines conventional treatments, emerging therapies, and supportive care strategies (Webb et al. 2021). Treatment selection depends on tumour type, stage, biology (genomic alterations), patient goals, and overall health. Precision methods (genomic profiling, biomarker-driven treatments, chimeric antigen receptor T-cell therapy [CAR-T]) increasingly tailor therapy. At the same time, integrative oncology applies evidence-based complementary modalities to reduce side effects and improve well-being, always alongside conventional care, not in place of it. Conventional modalities remain the cornerstones of cancer management, chosen and sequenced based on tumour site, stage, resectability, and systemic risk (National Institute of Health 2024)

Surgery: Many types of cancer are treated with surgery. Surgery is most effective for solid tumours confined to a single area (National Cancer Institute 2024). Other ways of performing surgery do not involve cuts with scalpels; and these are; cryosurgery, which is use of extreme cold produced by liquid nitrogen or argon gas to destroy abnormal tissue; Lasers, which is use of powerful beams of light to cut through tissue, it can focus accurately on tiny areas, can be used to shrink or destroy tumours or growths that may turn into cancer. Hyperthermia is a type of surgery in which small areas of the body are exposed to high temperatures. This high heat often damages or destroys the cancer cells or makes them more sensitive to radiation and other chemotherapy drugs.

Surgery is a local treatment, meaning that it treats only th*at* part of one's body with the cancer. It is not used for leukaemia (a type of blood cancer) or for cancers that have spread. It is meant for Curative-intent resection for localised disease, cytoreduction, diagnostic biopsies, and palliative procedures (e.g., obstruction relief). Surgical margins and nodal assessment guide decisions on adjunct therapy (National Cancer Institute, 2024). However, it is less effective for widely metastatic disease; it is inoperable when tumours involve critical structures or when diffuse blood cancers are present.

Radiation Therapy: This involves the use of high-energy radiation that damages cancer DNA, delivered as external beam radiation therapy (EBRT), brachytherapy, and stereotactic radiosurgery. Radiation therapy is useful for local control, pain palliation, and organ preservation (National Cancer Institute 2024).

Integration: This frequently involves combining radiation therapy with chemotherapy (chemoradiation) to enhance synergy in head & neck, cervical, and rectal cancers (National Institute of Health 2024).

Chemotherapy: The use of cytotoxic drugs to target rapidly dividing cells; typically systemic. Many different chemotherapy drugs are available. Chemotherapy drugs can be used alone or in combination to treat a wide variety of cancers. Though chemotherapy is an effective way to treat many types of cancer, chemotherapy treatment also carries a risk of side effects. Some chemotherapy side effects are mild and treatable, while others can cause serious complications (American Cancer Society 2023). This is what registered nurses in primary healthcare clinics in Botswana should know and

how to respond; hence, the need for developing a programme in cancer management to empower them.

Chemotherapy can be used in neoadjuvant, adjuvant, or palliative settings depending on disease biology and burden (Global Oncology Trends 2025). Considerations: Dose intensity, schedule, and supportive care (antiemetics, growth factors) influence tolerance and outcomes.

Hormone Therapy: It is mostly indicated in hormone-dependent cancers (e.g., ER+ breast, prostate). Agents include selective oestrogen receptor modulators/aromatase inhibitors and androgen-deprivation therapies. The aim here is to slow or halt growth by altering endocrine signalling, often in combination with targeted agents (e.g., CDK4/6 inhibitors*).* Targeted Therapy*:* It involves drugs that inhibit specific oncogenic drivers (e.g., EGFR, ALK, BRAF, HER2). Selection requires biomarker testing and genomic profiling (National Cancer Institute, 2024). It has the advantage of higher response rates and fewer off-target toxicities than broad cytotoxic drugs; resistance mechanisms require sequential strategies.

Immunotherapy: This is the use of Checkpoint Inhibitors, antibodies against PD-1/PD-L1 and CTLA-4, that “release the brakes” on T cells, leading to durable responses across subsets (melanoma, lung, renal, etc.) (National Cancer Institute 2024).

Adoptive Cell Therapies: Chimeric Antigen Receptor T-cell therapy, CAR-T cells engineered to target antigens (e.g., CD19), may show high efficacy in some hematologic malignancies; expanding to solid tumours with ongoing trials (National Cancer Institute 2024).

Stem Cell/Bone Marrow Transplant: Restores haematopoiesis after myeloablative therapy; autologous/allogeneic transplants in leukaemias, lymphomas, and myeloma; graft-versus-tumour effects contribute to control (American Cancer Society 2023).

Clinical Decision Drivers: Cancer type, stage/aggressiveness, performance status, comorbidities, patient preferences, and goals (curative vs palliative). Multidisciplinary tumour boards ensure coordinated plans (American Cancer Society 2023).

2.4.1 Emerging and precision strategies

Advances in molecular oncology and immunoengineering are reshaping treatment selection and monitoring. These demand robust diagnostics, longitudinal monitoring (e.g., ctDNA), and adaptive treatment algorithms to address resistance and heterogeneity. These are used mostly in high-income countries (HICs) because they have advanced infrastructure for next-generation sequencing (WHO 2022). These involve Genomic Medicine & Biomarker-Driven Care. Tumour Profiling**:** As next-generation sequencing (NGS) identifies actionable mutations, fusions, copy-number changes, and MSI/TMB status to guide therapy (e.g., EGFR inhibitors in NSCLC; BRAF/MEK in melanoma (American Cancer Society 2024).

Tumour-Agnostic Approaches: Some agents target molecular features regardless of tissue origin (e.g., NTRK fusions, high MSI). Advanced Immuno-Oncology Mechanistic Expansion: This is beyond checkpoints; strategies include bispecific antibodies, oncolytic viruses**,** and vaccines designed to elicit tumour-specific immunity.

Real-World Caveats: Immune-related adverse events (irAEs) can be multi-organ; management requires prompt recognition and adherence to steroid/immunosuppressive protocols within multidisciplinary teams.

2.4.2 Cell and gene therapies

2.4.2.1 CAR-T Evolution:

Chimeric Antigen Receptor T-cell therapy (CAR-T) has emerged from advances in manufacturing, dual-target CARs, and “armoured” CARs, which aim to overcome antigen escape and immunosuppressive microenvironments (National Institute of Health 2024). CRISPR & Gene editing involves preclinical/early clinical efforts targeting oncogenic pathways or enhancing immune cell function; still investigational, with safety and delivery challenges (National Institutes of Health 2024).

2.4.2.2 Novel delivery and combination science

Nanomedicine: These include drug carriers that improve pharmacokinetics and tumour accumulation, and therefore combination regimens seek synergistic effects while

mitigating toxicity (National Institutes of Health 2024). Drug repurposing, such as systematic screening, identifies non-oncology drugs with anticancer activity; it offers cost and speed advantages but require**s** rigorous trials.

2.4.2.3 Integrative oncology (evidence-based supportive care)

Integrative oncology combines conventional treatment with scientifically validated complementary therapies to address symptoms, function, and emotional well-being—never replacing standard therapy (National Institute of Health, 2024).

2.4.2.4 Scope and principles of integrative oncology – evidence-based supportive care

There must be provision of patient-centred care**,** which includes individualised plans coordinated with the oncology team to ensure safety, avoid drug interactions, and align with treatment goals (WHO 2020). Prescribed modalities include nutrition counselling, exercise/rehabilitation, acupuncture for chemotherapy-induced nausea or neuropathy, mindfulness-based stress reduction, and psycho-oncology support (therapy, support groups) (American Cancer Society 2023).

2.4.3 Benefits and evidence

Symptom relief includes integrative measures that can reduce fatigue, anxiety, pain, sleep problems, and treatment side effects, thereby improving adherence and quality of life (National Institutes of Health 2024). Emphasis on safety should be clear and distinct from alternative (replacement) therapies, which may delay effective treatment and jeopardise outcomes (American Cancer Society 2023). A multidisciplinary care pathway, which involves diagnosis and staging, imaging, pathology, and biomarker testing to define biology and extent, should be established and incorporated into the cancer management pathway (WHO 2020). Tumour board planning, which involves sequencing surgery, radiation, and systemic therapy to maximise local and systemic control, should be in place and known to healthcare workers (WHO 2020).

2.4.4 Linkage of Literature to Primary ~~healthcare~~Healthcare

Existing literature on cancer management in Africa is predominantly centred on tertiary and specialised healthcare institutions, with a notable paucity of research focused on primary healthcare settings. This imbalance reflects broader structural,

systemic, and research-related challenges that shape the generation and dissemination of knowledge within the region. One key reason for this trend is the historical organisation of cancer care within African health systems. Cancer diagnosis and treatment services are largely concentrated in tertiary hospitals, where specialised equipment, oncology expertise, and advanced treatment modalities are available. As a result, research activities are naturally situated within these institutions, as they are perceived as hubs of clinical excellence and data availability. Primary healthcare facilities, by contrast, typically have limited capacity for cancer diagnosis and management, which reduces opportunities for research engagement in these settings.

Additionally, the biomedical research agenda in many low- and middle-income countries has traditionally prioritised curative and hospital-based interventions over preventive and community-level care. Funding agencies and research institutions often allocate resources to studies conducted in tertiary hospitals, where measurable clinical outcomes and advanced interventions are more readily documented. This has contributed to the underrepresentation of primary healthcare in cancer research, despite its critical role in early detection, referral, and continuity of care. Another contributing factor is the limitation of infrastructure and research capacity at the primary healthcare level. Many primary healthcare facilities face shortages of trained personnel, inadequate record-keeping systems, and high patient loads, which make it difficult to conduct systematic research. The absence of robust data systems and cancer registries at this level further constrains the ability of researchers to generate evidence on cancer service delivery in these settings.

Furthermore, methodological challenges may deter researchers from studying cancer management in primary healthcare contexts. The complexity of capturing early-stage cancer presentations, referral pathways, and patient experiences requires longitudinal and mixed-method approaches, which can be resource-intensive and logistically demanding. Consequently, researchers may opt for tertiary settings where patient populations and disease profiles are more clearly defined.

Critically, this gap in the literature has significant implications for health system strengthening in Africa. Primary healthcare is a key entry point into the health system and plays a vital role in health promotion, early detection, screening, and referral of cancer cases. The lack of evidence in this area limits the ability of policymakers to design effective, context-specific interventions that address cancer care at the community and primary care levels. In synthesis, the dominance of tertiary-focused cancer research in Africa reflects structural health system arrangements, funding priorities, and research capacity constraints. However, this imbalance underscores an important gap that must be addressed to support comprehensive cancer control strategies. There is a pressing need for more research that explores cancer management within primary healthcare settings to inform decentralised, accessible, and equitable cancer services across the continent.

2.4.5 Chapter summary

Cancer management is complex and requires concerted efforts and the knowledge and skills of the interdisciplinary team. Literature indicates gaps along the cancer management pathway in LMICs. Realisation of SDGs remains a challenge because of the increasing cancer burden. There are delays in the diagnosis of cancer in LMICs because of many factors, such as a lack of resources and health illiteracy among communities, leading to late-stage disease. Certain management procedures cannot be performed in LMICs due to inadequate infrastructure. The impact of cancer on the psycho-socio-economic status of cancer patients, families and communities is immeasurable. Support for cancer patients and caregivers is very critical and is part of the treatment plan. Gaps identified in the literature were also evident in the study, though Botswana has conducted little oncology research. The literature review situated the study well, as it aligns with the identified gaps. The developed programme aligns with the identified gaps to improve cancer management in primary healthcare clinics.

2.5 THEORETICAL FRAMEWORK GUIDING THE STUDY

2.5.1 Patient reported outcome framework

The study was guided by the Patient-Reported Outcome Measure (PROM) framework, also known as patient-reported outcome measures, which first emerged in the 1970s.

It was developed by health researchers and psychologists who wanted to capture patients' perspectives on their health and daily functioning in the United States, Europe, and Germany.

The earliest widely recognised PROM was the Sickness Impact Profile (SIP), created in the mid-1970s at the University of Washington by Barbara Bergner, Bob Bobbitt, and colleagues**.** Disease-specific PROMs emerged in the 1980s and continued to evolve, and by 2010, they were adopted into health systems research and policy development. It was further reviewed by the National Health Care Institute and the Netherlands Federation of University Medical Centres by Van der Wees, Verkerk, Verbiest et al. (2019:75). Through a national project, they consulted end-users throughout the design, development, and testing phase (De Vito Dabbs, Myers, McCurry et al. 2009:102-106). The primary aim was to make the framework applicable internationally by adapting it to other contexts. The current framework was reviewed between January 2016 and March 2017 and validated through expert consensus among clinicians, researchers, and patient representatives.

Therefore, this study was guided by the Patient Reported Outcome Measure (PROM) theoretical framework. This theoretical framework guides the incorporation of patient-reported outcomes into the monitoring of health services and is believed to provide more Comprehensive feedback on services and the quality of care for the outcomes being measured. PROMs were initially developed for use in health service research (Black 2013:167) and are used to improve patient clinical care (Black & Jenkinson 2009: 239). Currently, several disease-specific PROMs have been developed, validated, and are used globally to improve health care services, and organisations such as EuroQol, the US Food & Drug Administration, and the European Medicines Agency have both released guidelines for the use of PROMs and made them available to researchers (Black 2013:167).

The Patient-Reported Outcome Measure theoretical framework comprises seven major concepts: cognitive and emotional aspects; lifestyle factors; characteristics of treatment; healthcare services and systems; health experience and state; social and material context; and, in the centre, patient outcomes and patient quality of life. Under each, there are two to five sub-components, all of which lead to patient outcomes and quality of life in the centre. The concepts are interconnected and interrelated, and they

are used to assess the general health status of patients with chronic conditions. For the patient to achieve positive health outcomes, all concepts outlined in the theoretical framework should be closely monitored, and if there is any deviation from normal, corrective measures should be taken, as indicated, to prevent complications (Ramsey, Corsini, Hutchinson et al. 2020:56-59). The seven key concepts of the framework are discussed under 2.5.2.

Below is a schematic presentation of the framework, depicting the concepts.

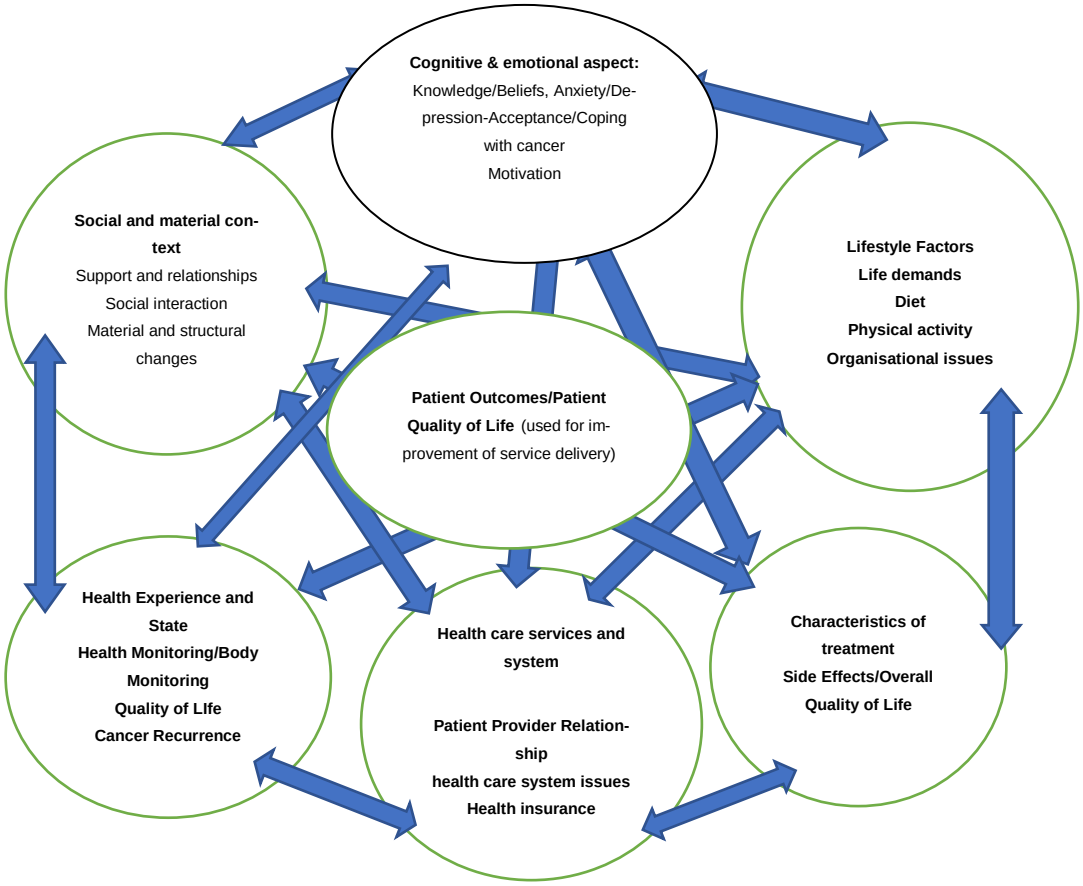


Figure 2.1: Patient Reported Outcome Theoretical Framework

(McClimans 2010; Ramsey et al. 2020; Greenhaigh et al. 2018).

2.5.2 Application of the patient-reported outcome theoretical framework

The patient outcomes of interest align with the seven concepts depicted in the theoretical framework. These are directly reported by the patient, without a clinician's interpretation of the patient's response. The seven concepts are discussed below to demonstrate their applicability to the study; they are not presented in any linear fashion, as they are interwoven.

i) Lifestyle factors, social and material context

These are behaviours and habits reported by cancer patients that directly shape their health outcomes. Key components under lifestyle factors include physical activity, diet, smoking, alcohol use, and sleep patterns. In this study, lifestyle factors were assessed

using the EQ-5D questionnaire (details in 3.9.6), which assessed frequency, intensity, and perceived impact. Lifestyle self-reported data provides critical insights into risk behaviours, guides personalised care, and is essential for monitoring interventions such as lifestyle modifications.

The social context captures interpersonal and societal factors that affect a patient's health, such as marital status, employment, socioeconomic status, and community support (Hutchings et al. 2024:48).

Social inequities, such as lack of access to well-resourced healthcare facilities like those in LMICs, correlate with worse patient-reported outcomes, especially in cancer. Understanding social context helps illuminate disparities in health outcomes and informs tailored interventions to bridge care gaps. Material context refers to tangible resources, such as economic, environmental, and infrastructural factors that support or hinder health; these include income, housing stability, neighbourhood conditions, transport, and healthcare access. Hutchings et al. (2024:48) purport that material factors significantly affect health behaviours, treatment adherence, and self-management. Including them in PROMs enables a fuller understanding of patient needs and barriers to health equity. Inclusion of these multidimensional factors makes PROMs powerful tools for understanding not only what patients feel but also why and how contextual environments shape outcomes.

ii) Side effects of chemotherapy

Chemotherapy refers to the use of medicines to destroy cancer cells. There are many different types of chemotherapy, as discussed in (2.4). They do not all work the same way, so different types of chemo might be used for different types of cancer. Most are given as an infusion into a vein (IV), but some are given as an injection, taken as pills, or applied to the skin. Chemotherapy affects healthy, rapidly dividing tissues such as the bone marrow (myelosuppression), the gastrointestinal lining (nausea, mucositis), and hair follicles (alopecia). Other adverse side effects include organ toxicities, such as the heart, kidneys, lungs, and nerves, depending on the agent type, e.g., cisplatin nephrotoxicity and anthracyclines cardiotoxicity (WHO 2020). Therefore, it is important to assess these and the extent to which primary healthcare clinics provide care to

relieve the distressing side effects. Providing psychological support when they experience side effects is very important. Ongoing counselling for adherence. Supportive care with anti-nausea meds, growth factors, and hydration. Nurses in primary healthcare clinics should be equipped with knowledge and skills to assess and provide comprehensive care.

iii) Health experience and state

Physical, psychological, and social dimensions shape the health experience and state of cancer patients undergoing treatment. *Physical health*: The experience includes treatment side effects, which may be caused by chemotherapy, radiation, and targeted therapies, which often cause fatigue, nausea, vomiting, mucositis, alopecia, neuropathy, and myelosuppression (WHO 2020). *Symptom burden*: Pain, sleep disturbances, and appetite changes are common. *Functional decline*: Reduced strength and mobility can affect daily activities (American Cancer Society 2023). These were included under the assessment of quality of life and of healthcare services provided, as well as of whether they contribute to positive patient outcomes (McLouth et al. 2021:45).

iv) Psychological: Cognitive and emotional state

A cancer diagnosis in resource-limited settings, such as in low- and middle-income countries like Botswana, is often associated with loss of income and death, and it often leads to emotional distress characterised by anxiety, depression, and fear of recurrence (Mikkonen, Hökkä, Saarto, et al 2025:56-60). Other cognitive changes, such as “Chemo brain” (memory and concentration difficulties), can occur. Regarding adaptation and coping, patients may experience resilience over time or struggle with uncertainty; they should not suffer alone. Nurses in primary healthcare clinics should be able to assess and address this with patients (McLouth et al. 202:45).

v) Social dimension

Cancer patients require continuous support from family, friends, and community support groups. Strong family and community support improves coping and quality of life. Financial Strain: Treatment costs and inability to work can lead to economic hardship. Isolation: Physical limitations and stigma may reduce social interaction (Claessens, Ramaekers, Lobbezoo, Van Kampen, De Boer, Van de Wouw, Dercksen, Geurts,

Joore & Tjan-Heijnen 2020). Each time a cancer patient presents at a health facility, a Comprehensive assessment of these key components should be conducted throughout the cancer management pathway.

vi) Quality of life

The quality of life focuses on physical functioning, emotional well-being, social roles and managing symptom severity. Treatment plans for cancer should include integrated care models that incorporate psychosocial support and palliative care early in disease management, as these have been proven to enhance multiple quality-of-life dimensions (Grassi 2017:29). Personalised non-pharmacological and psychosocial interventions effectively address emotional distress, symptom burden, and functionality. Longitudinal monitoring, especially for vulnerable groups such as older adults, is vital given QoL curves that may fluctuate over time (Mikkonen et al. 2025).

vii) Healthcare services

The comprehensive cancer services included assessment of cognitive and emotional aspects of a patient, lifestyle factors, social and material context, characteristic of cancer treatment this included even the side effects whether mild or serious, health experience and state, and their general impression of health care services including follow-up care at home, this was done under. The interview guide and questionnaire were developed in line with the theoretical framework's concepts and the study objectives. Cancer patients had to rate the services they received at primary health care clinics; after providing an account of their health status as indicated above, details are in Chapters 4 and 5 under the quantitative approach, Phase 1. The nurses' perceptions of the services provided to cancer patients were also explored and described, using the Phase 1 qualitative approach. Details are in Chapters 4 and 5, and the results of the two approaches converge and lead to the conclusion.

2.6 Patient Reported Outcome Measures Framework and Mixed Method Approach

The study was guided by a Patient-Reported Outcome Measures (PROMs) framework, which emphasises the importance of capturing patients' perspectives regard-

ing their health status, experiences of care, and outcomes of healthcare interventions. PROMs are inherently patient-centred and focus on understanding healthcare delivery from the patient's viewpoint, making them particularly relevant in evaluating cancer service delivery.

The application of a mixed-methods approach complemented the PROM framework by enabling the collection and integration of both quantitative and qualitative data. The quantitative component of the study facilitated the measurement of patient-reported outcomes through structured instruments, capturing key indicators such as access to services, satisfaction, and perceived quality of care. This provided measurable and generalisable data reflecting patients' experiences.

In contrast, the qualitative component provided an in-depth exploration of patients' lived experiences, perceptions, and challenges encountered within the healthcare system. Through interviews and open-ended responses, patients were able to articulate the meanings, emotions, and contextual factors underlying their reported outcomes. This enriched the interpretation of quantitative findings by offering deeper insights into the reasons behind patient responses.

The integration of quantitative and qualitative data strengthened the application of the PROM framework through triangulation and complementarity. Quantitative findings provided the "what" in terms of patient-reported outcomes, while qualitative findings explained the "why" and "how" of these outcomes. This holistic approach ensured a more comprehensive and contextually grounded understanding of cancer service delivery.

Furthermore, the mixed-methods design operationalised the PROM framework by combining measurable outcomes with experiential evidence, thereby enhancing the validity and applicability of the findings. This integration allowed for a more nuanced assessment of healthcare services and supported the development of a patient-centred programme aimed at improving cancer service delivery in primary healthcare settings.

2.7 CHAPTER SUMMARY

Chapter 2 discussed the literature on cancer as a life-threatening disease. The overview, prevalence, and burden of the disease globally were discussed. Challenges faced by healthcare systems in low- and middle-income countries in managing this condition were discussed. The impact of the disease on the individual and family was also addressed. A theoretical framework guiding the study was also discussed. Chapter 3 discusses the research methods.

CHAPTER 3: RESEARCH METHODS AND DESIGN

3.1 INTRODUCTION

The previous chapter discussed literature on studies of cancer, its impact, and its management. This chapter outlines the research methods and design, including the theoretical framework that guided the study (2.5.1). This study utilised a convergent parallel mixed-methods design (Creswell & Plano-Clark, 2018; Creswell & Poth, 2024). In mixed-methods research, the quantitative and qualitative designs complement each other in terms of their strengths and weaknesses. In this study, qualitative and quantitative data were collected simultaneously, analysed separately, then merged, compared, and corroborated across both strands to provide a comprehensive understanding.

The study employed a mixed-methods approach utilising a convergent parallel design, which enabled method triangulation. This design allows for simultaneous quantitative and qualitative data collection, with the data weighted equally. Data analysis was performed separately, after which the results of the two approaches were compared, merged, and interpreted as a single study outcome. This study was done in 3 phases.

Phase 1: Simultaneous collection and analysis of qualitative and quantitative data, in line with Objective 1: Exploring the perceptions of nurses regarding cancer service delivery in primary healthcare clinics and Objective 2: Assessment of cancer patients' quality of life and outcomes in relation to cancer services received at the primary healthcare clinics.

Phase 2: A scoping review was conducted to map programs on cancer service delivery in primary healthcare clinics.

Phase 3: The program development and validation phase entailed developing a program for managing cancer service delivery in primary care settings in Botswana, utilising the Dickoff et al. (1968:422) framework. The program was validated using an e-Delphi technique. The e-Delphi technique involved subjecting a programme to an expert panel for validation. For this study, experts involved oncology and palliative care practitioners, nurse managers working in primary healthcare clinics, community health nurses, and policymakers.

3.2 PHILOSOPHICAL ASSUMPTIONS IN RESEARCH

Research studies are guided by different worldviews and philosophical assumptions of the researcher, i.e. what the researcher brings to the study (Creswell & Plano-Clark 2018:210; Chaturvedi et al. 2014:116-118; Wasti et al. 2022:1175-1178). It is argued that philosophical orientations, the nature of research, and the researcher's contribution to a study are shaped by disciplinary orientations and past experiences. Furthermore, philosophies shape how researchers formulate problems and research questions in a study, and how they seek to answer them (Creswell & Poth 2018:13). A philosophical approach refers to a way of thinking and critically questioning knowledge claims that have been established by the community of scholars through different forms of enquiry (Chaturvedi et al. 2014: 116-118).

Creswell & Poth (2024: 48) indicate that worldviews are all-encompassing, as they may or may not be associated with a community of scholars with shared beliefs and values in research, and other researchers tend to use the term paradigms.

3.3 PARADIGMATIC PERSPECTIVES

Paradigms are a set of generalisations and beliefs by a community of scholars. It is a philosophical stance taken by the researcher to provide a set of beliefs that guides actions during the research process (Creswell & Poth 2024:48-50). Warelow (2013:22) also suggests that a paradigm is the worldview of a phenomenon, and a paradigmatic perspective is the way the researcher views and understands the research. A research paradigm is thus an approach or guideline that has been verified over time by the scientific community and provides a model or framework for conducting research (Rehman & Alharthi 2016:55-57). It is further assumed that close ties exist between the philosophies one brings to the research and the use of these philosophies as a framework to guide the research process (Creswell 2015:28; Creswell & Poth 2018:30). In this study, the following paradigmatic perspectives are discussed in relation to their relevance.

3.4 PRAGMATISM

Pragmatism is a worldview associated with mixed methods research. Polit and Beck (2017:24) state that pragmatism is concerned with induction and deduction, in which

theories can be developed and verified, and it encourages pluralistic views. Creswell and Plano-Clark (2018:38) state that mixed-methods research is situated in the middle of the continuum between quantitative and qualitative research. Accordingly, this worldview is concerned with the research question or problem (Creswell & Plano-Clark 2025:48-50; Polit & Beck 2021:42). Pragmatism involves using a mixed-methods approach to address a specific issue by integrating numerical trends with narrative insights to provide a holistic view. Finally, pragmatism acknowledges the importance of context in shaping healthcare delivery. Given that oncology services at the primary healthcare level in Botswana are still developing, a flexible and adaptive research approach is necessary. This allows the study to generate findings that are both context-sensitive and transferable to similar low-resource settings.

The researcher opted for pragmatism, as it is relevant to mixed-methods studies and guides the generation of better results to answer the research questions. There are different types of mixed-method designs, which are discussed below.

Convergent Parallel Design: This involves the use of quantitative and qualitative methods; data are collected simultaneously, analysis is done separately, and the results are merged and presented as the outcome of a single study (Creswell & Plano-Clark 2018: 45-48). A strength of the convergent parallel design is its ability to facilitate the collection of complementary data from different sources at the same time. In this study, quantitative data provided measurable indicators of patient-reported outcomes, such as access to services and perceived quality of care. Concurrently, qualitative data offered in-depth insights into patients' lived experiences and nurses' perceptions of cancer service delivery. The simultaneous collection of these datasets ensured that findings were grounded within the same context and timeframe.

Explanatory Sequential Design: A two-phase design in which the researcher starts with quantitative data collection and analysis, then follows up with qualitative data to explain or elaborate on the quantitative results. According to Ivankova, Creswell, & Stick (2006:34), this type of mixed-methods design begins with quantitative data, followed by qualitative data to explain the findings.

Exploratory Sequential Design: This is a two-phase design in which concepts are first in-depth explored using a qualitative approach, followed by the development of an instrument or the generation of hypotheses to test or generalise (Creswell 2017:46).

Embedded Design: Creswell & Plano-Clark (2018:48) report that, in this mixed-methods design, one data set serves a supporting role within a larger design (either qualitative or quantitative). This is done to enrich the main study by adding complementary data, and it is used in experimental studies, program evaluations, or clinical trials.

Transformative Design: Romm (2015:52) argues that this design uses mixed methods within a transformative framework to ensure research is inclusive, participatory, and action-oriented. The framework shapes research questions, data collection, analysis, and interpretation.

The study was guided by a convergent parallel mixed-methods design. The rationale for using a convergent parallel mixed-methods design in this study is its ability to provide a comprehensive understanding of the research problem by integrating simultaneously collected quantitative and qualitative data. This ensures complementarity because quantitative data provides a study with numerical trends and the possibility of generalizability, while qualitative data provides the researcher with depth in terms of context, meaning, and experiences. Combining the two approaches provides a full picture rather than relying on a single perspective. In this study, the two approaches provide a better understanding of cancer service delivery from the perspectives of clients and health care providers (nurses) in primary healthcare clinics. The two approaches study the same phenomenon, which in this study is cancer service delivery in primary healthcare clinics by exploring the perceptions of nurses regarding cancer management as service providers and assessing cancer patients' quality of life and outcomes in relation to services received from these clinics. The use of these different methods to study the same phenomenon increases validity, and if both data sets lead to similar conclusions, the findings are said to be more credible. Concurrent data collection saves time compared to sequential designs and is therefore ideal for limited time frames.

In this study, data were collected simultaneously, analysed separately, and, lastly, the results were weighed equally and integrated. Equal weighting was justified because

neither strand alone is sufficient to explain the problem; instead, they provide complementary forms of evidence that must be integrated to produce meaningful conclusions. As stated by Polit and Beck (2021:220) and Wasti et al. (2022:1175-1178), several factors can affect the decision to choose a mixed-method design, including priority decisions in selecting the design and the researcher's worldview, as discussed below.

The reviewed literature, including the WHO Reports on Cancer 2020; 2022; GLOBOCAN 2022; and the National Institute on Cancer 2024, indicates that cancer is a serious global health problem. Literature indicates gaps in the management of cancer, especially in low- and middle-income countries. In Botswana cancer research started in 2010, mostly by civil society organizations such as Botswana Harvard Partnership mostly on HIV/AIDS and cancer, the most recent study was done by Koobotse et al.(2023) a systematic review on Bibliometric analysis of cancer research outputs in Botswana between 2009 and 2021, and indicated that cancer research is still lacking, and therefore highlighted the need to strengthen local research capacity in the on cancer management in Botswana, hence the need to conduct this study.

Below are the study's philosophical, theoretical, and methodological assumptions.

3.4.1 Philosophical assumptions that guide the study

Philosophical assumptions in research refer to the underlying beliefs and perspectives about reality, knowledge, and values that guide how research is conducted (Polit & Beck 2021). These assumptions shape the research design, methods, and interpretation of findings. Therefore, these are discussed under ontology, epistemology, and methodology.

3.4.2 Ontology

This is how the researcher views nature (Polit & Beck 2021:9). Ontology relates to a specific reality and its characteristics. Ontology is concerned with one's beliefs about what exists in the world. It can exist as realism or objectivism, which are based on objective reasoning and evidence. Also, reality can be subjective and vary across individuals, making it more relative.

In quantitative research, this reality is guided by cause-and-effect thinking, or determinism. However, in qualitative research, it is guided by multiple realities, meaning there is no single truth but rather multiple truths, as each participant brings their own understanding to the phenomenon under study.

In this study, the ontology is based on pragmatism, meaning the focus is on the research questions rather than the methods (Creswell 2017). The researcher addressed each phase of the study to answer a specific research question. In Phase 1, the researcher utilised multiple realities as presented by the participants, using qualitative interviews to answer the research question: “What are nurses' perceptions of cancer services in primary healthcare clinics?” Their responses were guided by their experiences as they encountered cancer patients in their health facilities. To complement nurses’ perceptions, a quantitative approach was applied as part of a phase aimed at realism, which is based on objective reasoning and evidence. This was done to answer the research question “What are the cancer patients’ outcomes and quality of life in line with services received in primary healthcare clinics? A structured questionnaire was used to answer these questions. The researcher believes that reality is subject to many interpretations and is relative; therefore, it requires multiple research perspectives to be fully understood.

3.4.3 Epistemology

Epistemology is the relationship between the researcher and the study participants (Polit & Beck 2017). Epistemology is closely connected to method, as both are concerned with knowledge creation and validation (Farrow, Iniesto, Weller & Pitt 2020). Research methods are essentially epistemologies; hence, by following a certain process, researchers support their claim to know about the thing(s) they have been researching. The researcher believes that reality is observable and subject to interpretation. Therefore, to conclude what reality is, it is important to use different research approaches. The researcher interacted with the participants in their settings as they described cancer service delivery in primary healthcare clinics.

3.5 STUDY DESIGN AND METHODS

The study employed a mixed-methods approach utilising a convergent parallel design. This design involves the use of qualitative and quantitative methods; data are collected

simultaneously or concurrently during the same phase (Creswell & Plano-Clark 2018), which in this study was Phase 1. An interview guide was used to collect qualitative data through focus group discussions with nurses in primary healthcare clinics, and a questionnaire for a quantitative approach among cancer patients. Analysis of data was done separately or independently, and thematic analysis was done using Braun & Clarke (2019) steps for qualitative data and statistical analysis (descriptive and inferential) for quantitative data. Results were merged for comparison and presented as an outcome of a single study (Creswell & Plano-Clark 2018). Merging the results at the end informed the development of a programme to guide cancer service delivery in primary healthcare clinics. In a concurrent parallel mixed-methods design, results are compared or combined to see where they converge, diverge, or complement each other.

3.5.1 Methodology

Research methodology systematically describes and explains the logical process of applying all steps, strategies and procedures for collecting and analysing data in a research study as directed by the research design (Brink et al. 2012:187; Brink & Van Rensburg 2022; Creswell 2018; Saunders, Lewis & Thornhill 2019). The study followed a convergent parallel mixed methods design in three phases, as presented below.

Phase 1: Simultaneous data collection of qualitative and quantitative data in line with Objectives 1 and 2 of the study.

Both data sets were collected concurrently where an interview guide was used to collect qualitative data with a purposive sample of thirty-two(32) nurses working in primary healthcare clinics using focus groups in line with Objective 1 of the study, whilst quantitative data was collected with a sample of 135 cancer patients in line with Objective 2, using EuroQol EQ-5D questionnaire which was adopted and used with permission from EuroQol Research Foundation(2008). This was followed by independent analysis of both data sets: qualitative data was analysed using the steps of thematic analysis by Braun & Clarke (2019), and quantitative data was analysed using SPSS version 27 for descriptive and inferential analyses (Chi-square). The findings were

merged for comparison and presented as an outcome of a single study (Creswell & Plano-Clark, 2025).

Phase 2: Scoping review of cancer service delivery programmes in primary healthcare settings

A scoping review on cancer service delivery programmes in primary healthcare settings in line with Objective 3 was guided by the Mixed Methods Appraisal Tool (MMAT) version 2018 and Arksey & O'Malley (2005) guidelines.

Phase 3: Programme development and validation

This phase entailed developing a programme to manage cancer service delivery in primary healthcare clinics in Botswana, using the Dickoff et al. (1968:422) framework. The programme was validated using an e-Delphi technique through a team of experts' consensus-building. The e-Delphi method involved sending a programme to the expert panel for validation. For this study, experts included oncology and palliative care practitioners, Nurse managers working in primary healthcare clinics, community health nurses, and policy makers, making a total of twelve (12).

3.6 STUDY SETTING

A study setting refers to an area(s) where data are collected, and this study had multiple sites, for Phase 1; qualitative phase, was conducted among nurses in Molepolole, Kanye and Ramotswa, primary healthcare clinics in Botswana All these villages are in the southern part of the country, and all have primary healthcare clinics that have similar characteristics, such as the sizes of clinics in terms of infrastructures, services provided, and staffing patterns. 95% of nurses in these clinics are registered nurses, and 5% are registered nurses with a post-basic qualification such as midwifery (diploma). Registered Nurses working in these areas, even across the country, do not receive any oncology training. At the oncology clinic in Gaborone, patients were identified and sampled because primary healthcare clinics do not keep records of cancer patients.

The researcher decided to use an oncology clinic to identify cancer patients because it is a central point, and all cancer patients registered at this clinic come from all areas

in the southern part of Botswana for specialist review. Village clinics do not keep records of cancer patients. In Molepolole, there are 8 clinics and 97 general nurses; in Kanye, 9 clinics and 98 general nurses; and in Ramotswa, 3 clinics and 41 general nurses. The oncology clinic in Gaborone had 320 cancer patients registered at the time of data collection.

3.7 POPULATION AND SAMPLING

This section describes the study population, sampling procedure, sampling criteria, sample, and sample size.

3.7.1 Population

A study population refers to the entire group of people that meet the criteria under investigation (Brink et al. 2012; Polit & Beck 2021). For this study, the population consisted of all nurses working in public primary healthcare clinics providing services to patients with different conditions, including cancer, and all cancer patients in need of cancer services after being discharged from the Oncology Centre and on home care. The study sites were the Molepolole, Kanye, and Ramotswa primary healthcare clinics and the Oncology Centre. Registered Nurses were included in this study to provide their perceptions of cancer service delivery in primary healthcare clinics. The total population of nurses across the three selected study sites was 213, distributed as follows: Molepolole clinic (97 nurses), Kanye clinic (75 nurses), and Ramotswa clinic (41 nurses). From this population, participants who met the inclusion criteria, having worked in a clinic for 6months and above, were recruited to take part in focus group discussions.

To explore nurses' perceptions of cancer service delivery in primary healthcare settings. A total of three focus group discussions were conducted, with one focus group held at each study site. This approach ensured representation from all clinics while allowing for in-depth exploration of contextual experiences specific to each setting. The number of focus group discussions was guided by the principle of data saturation. Data saturation was reached when no new themes, patterns, or insights were emerging from the discussions. During the third focus group discussion, nothing new was coming; therefore, we ended up with only three focus groups. One (1) focus group was

identified at each study site with assistance from the nurses in charge, and each clinic in each study site was represented in the focus groups.

The number of focus group discussions was guided by the principle of data saturation. Data saturation was reached when no new themes, patterns, or insights were emerging from the discussions. During the third focus group discussion, no new information emerged; therefore, only three focus groups were conducted. This became the final saturation in the third focus group.

The population for the quantitative approach is discussed in 3.8.

3.8 PHASE 1 – SIMULTANEOUS DATA COLLECTION OF QUALITATIVE AND QUANTITATIVE DATA IN LINE WITH OBJECTIVES 1 AND 2 OF THE STUDY

This phase involved simultaneous data collection utilising qualitative and quantitative approaches in line with Objective one (1); to explore the perceptions of nurses working in primary healthcare clinics regarding cancer service delivery, and Objective two(2); Assessment of cancer patients' quality of life and outcomes in relation to cancer services provided at the primary healthcare clinics.

3.8.1 Sampling

Sampling is the process of selecting cases to represent the entire population to permit inferences about the population (Polit and Beck 2021:250). All the nurses at the study sites who met the inclusion criteria and were available at the time of data collection were considered for potential participation in the study. In this phase, purposive sampling was used to select thirty-two (32) from primary healthcare settings.

3.8 .2 Sampling technique and sample size.

According to Brink et al. (2012:117), "a sample is a fraction or a part of a whole that is selected by a researcher." It is a small number of items, objects, or groups of people taken from an entire population for measurement (Bhardwaj 2021:158; Polit & Beck 2021:48; Creswell 2017:120). For this study, purposive sampling was used to select nurses to participate in the qualitative part of the study, with one focus group per study site, constituting Molepolole, twelve (12), Kanye, eight(8), and Ramotswa, eight (8),

making a total of thirty-two(32). The sampling technique for the quantitative approach was convenience sampling, with the RAOSOFT sample size calculator used to determine the sample size from a total population of 320 cancer patients. The sample size was 175, and only 135 consented to take part in the study; more details in 3.9.2 and Figure 2.

The sample size is a smaller proportion of the targeted population, and researchers strive to select a representative sample in quantitative research (Brink et al. *2*012:129; Brink & Van Rensburg 2022:46; Creswell, 2017:120). Purposive sampling was used to select registered nurses in primary healthcare clinics who met a specific criterion stated below, and 32 nurses voluntarily consented to participate in the study. For the quantitative approach, 135 cancer patients voluntarily consented to participate in the study and were conveniently selected, as their condition and state of health dictated whether to approach them.

3.8.3.1 Inclusion Criteria

Nurses

The following inclusion criteria were applied to nurses working in primary health care clinics:

- Nurses with at least six months of experience providing direct care to patients in a clinic in all selected sites of the study, and had a minimum qualification of a diploma in nursing.
- Nurses had to be registered with the Nursing and Midwifery Council of Botswana.
- Nurses should be willing to participate in the study.
- Must be present on the day of data collection.

3.8.3.2 Exclusion Criteria:

The following exclusion criteria were applied to nurses:

- Any nurse with less than 6 months of experience providing direct care to patients in clinics.

- All who did not have current registration with the Botswana Nursing Council.
- Absent on the day of data collection.

3.8.4 Data collection tool – Qualitative approach

The data collection tools for Phase 1 were aligned with the parallel-convergent mixed-methods approach. The interview guide (Annexure E) for nurses had two sections: A and B. Section A covered participants' demographics, and Section B included questions on services provided to cancer patients and whether there was a need for a programme to guide the delivery of these services. The interview guide was adapted from the EuroQol EQ-5D questionnaire, in line with concepts from the PROM Framework. The interview guide was validated by WB, a researcher well-versed in qualitative research, and the researcher's supervisors provided feedback and input under Section B, which were corrected accordingly. The interview time was 45 to 60 minutes. Prior to data collection, a pilot study was conducted to assess the clarity of the interview guide. This was to ascertain whether there was any ambiguity and to make corrections where indicated.

Qualitative data on nurses' perceptions of cancer service delivery in primary health care clinics were collected through focus group discussions. Focus group discussions involves grouping at least 8 to 12 people with the same experiences in a group with the view to solicit their opinions on a particular subject simultaneously (Brink et al. 2012:36; Brink & Van Rensburg 2022:60; Polit and Beck 2021:120), or as recommended by other authors a group of 6 to 8 participants (Dilshad & Latif 2013:40; Nyumba, Wilson, Derrick et al 2017:22). The interviews were conducted in English for 45 to 60 minutes.

English is the official language in Botswana, and all nurses have undergone training in nursing using English as the medium of instruction. It was used during interviews, and they were able to articulate their views well without any problems. The interviews were conducted solely by the researcher. Interviews were recorded with participants' permission to ensure accurate data collection. A trained research assistant, together with the researcher, recorded field notes. The focus group discussions were conducted in a meeting room organised by the nurse in charge at a central location in

each study site. Each of the clinics in the three study sites, Kanye, Ramotswa and Molepolole, was represented in the focus groups. There were three focus groups of eight, eight, and twelve nurses, with Molepolole having a focus group of twelve because it had more nurses than the other two areas.

The researcher facilitated the discussions. The interviews lasted approximately 40 minutes to an hour. Data collection was conducted on Tuesdays and Thursdays after midday to allow nurses to attend to patients in the mornings. The nurse in charge reported that the chosen time was appropriate because patient volume is usually reduced around that time.

3.8.6 Data collection – qualitative approach

This followed approval of the study by the University of South Africa Health Research and Ethics Committee (UNISA HREC) and the Unisa College of Human Science Ethics Committee (University of South Africa) NHREC Registration #: Rec-240816-052 CREC Reference #: 11383372_CREC_CHS_2021 (Annexure A). This study was conducted in Botswana, and recruitment commenced following ethical clearance from the Botswana Ministry of Health Research and Ethics Review Board (ref. HPRD:6/14/1; Annexure B). Permission was sought from the District Health Management Teams under which Primary Healthcare clinics are managed (Annexure C) in Molepolole, Ramotswa and Kanye to access primary healthcare clinics in these areas. The researcher met with nurses-in-charge at each selected clinic to inform them about the upcoming study and share its details.

The total population of nurses across the three selected study sites was 213, distributed as follows: Molepolole clinic (97 nurses), Kanye clinic (75 nurses), and Ramotswa clinic (41 nurses). From this population, participants were recruited to take part in focus group discussions aimed at exploring nurses' perceptions of cancer service delivery in primary healthcare settings. A total of three focus group discussions were conducted, with one focus group held at each study site. This approach ensured representation from all clinics while allowing for in-depth exploration of contextual experiences specific to each setting. The number of focus group discussions was guided by the principle of data saturation. Data saturation was reached when no new themes, patterns, or insights were emerging from the discussions.

Potential participants were recruited by the mediators, who were nurses in charge of the primary healthcare clinics, through word of mouth. The researcher used a flier that outlined the study topic, purpose, data-collection period, and the researcher's contact information (phone number and email address). This was posted on open notice boards for nurses and patients to see. Those interested in the study met with the researcher immediately after the morning report, facilitated by the nurse in charge. Then the researcher provided them with more information about the study, including the procedure for signing the consent form. The researcher informed potential participants about the voluntary nature of the study, the possible risks, and their right to withdraw at any time without giving a reason.

However, it was also important to inform participants that, once data collection was complete, it would not be possible to trace their information, as it had been de-identified for confidentiality reasons. The process entailed explanations of the study's purpose, data collection procedures, and assurances of confidentiality and safe data handling and storage. The participants were then given a consent form to read on their own in the language they preferred and understood, then mandated to sign in the presence of a witness and the researcher. The consent forms were given a code for identification purposes.

Informed consent in research is a “voluntary” agreement to participate, and it is the basis for ethical research. For this study, it entailed a process whereby the participant had to understand what the research was all about, the purpose, methods to be followed, benefits and potential risks, if any (Shahnazarian, Ajdemirov, Hurcev et al. *2*020:3). Informed consent was sought from all participants in the study through face-to-face meetings. The researcher was responsible for collecting the signed consent forms.

3.8.6.1 Field notes

The researcher documented field notes to track what transpired during data collection for activities that could not be recorded, such as nonverbal communication (facial expressions, gestures, and group dynamics) that could not be captured by recording. Deggs & Hernández (2018:281) indicate that field notes are documented observations and reflections of the researcher during and after the interview. The field notes were captured as descriptions and reflections of what was observed during data collection.

Reflections or reflective field notes involved the personal account of what was observed during the interview (Polit & Beck 2021:178).

3.9 PHASE 1: QUANTITATIVE APPROACH

For the quantitative approach, a descriptive cross-sectional design was used to assess cancer patients' outcomes and quality of life, in line with Objective 2 of the study, using a Patient-Reported Outcome Measure (PROM) tool (Annexure A). PROMs were developed for use in health service research (Black, 2013) and to improve patient care (Black & Jenkinson 2009). The questionnaire had three sections: Section A: demographic factors; Section B: patient outcomes; cognitive and emotional aspects of cancer patients, quality of life, side effects of cancer, health experience and state, patient outcomes, and lifestyle factors, social and material context; and Section C: rating of healthcare services received by cancer patients on a scale of 1 to 10. Questionnaire validation is presented in 3.9.7 under the data collection instrument.

3.9.1 Study population

The population comprised all cancer patients registered at the oncology clinic in Princess Marina Hospital, Gaborone. The patients were reviewed every two weeks, once a month, or once every two or three months, depending on the treatment plan. A total of 320 cancer patients were registered at the oncology clinic; this was the population from which the sample was selected. These reviews are critical because Williams & Thompson (2025:110) indicate that they enable early detection of cancer recurrence, management of treatment side effects, psychological support, and improved quality of life. Regular consultations provide emotional reassurance and support, enabling patients to voice anxieties, especially about recurrence or treatment impact. While waiting for their review by an Oncologist at the oncology centre, they access services at their local village clinics or primary healthcare clinics in various villages, including areas where the study was conducted. Their need to access services at primary healthcare clinics depends on an individual treatment plan.

3.9.2 Sampling and sampling technique

Sampling is the process of selecting cases to represent the entire population to permit inferences about the population (Polit and Beck 2021:80). According to Brink et

al. (2012:224), “a sample is a fraction or a part of a whole that is selected by a researcher. “It is a small number of items, objects, or groups of people taken from an entire population for measurement (Bhardwaj 2021). To select a sample, a sampling procedure is followed. For this study, convenience sampling was used. It was found relevant because patients' conditions determined whether they could be recruited and interviewed. They had to be assessed first, and the nurse in charge on that day did so. This sampling technique was considered appropriate due to several contextual and practical considerations within the study setting. Firstly, the researcher was uncertain about the number of cancer patients who would present at the clinic on any given day, making it difficult to implement probability-based sampling methods. Though some had appointments, some turned up sick and weak and were not able to take part in the study.

There were 320 cancer patients registered at the oncology clinic at the time of the study. This is the population from which the sample was drawn. A RAOSOFT sample size calculator was used to calculate the sample size and indicated a sample of 175 Ref. Figure 3.1.

3.9.3 Sample size

Sample size is a smaller proportion of the targeted population, and researchers strive to select a representative sample in quantitative research (Brink et al., 2012; Polit & Beck, 2021:80). A RAOSOFT sample size calculator was used to determine the sample size. The entire population of cancer patients was 320 (registered at the oncology clinic). Based on a 95% confidence level and a 5% margin of error, the sample size for cancer patients was 175; however, 135 consented to participate in the study, and n=40 did not meet the inclusion criteria. The shortfall was attributed to several practical, clinical, and ethical challenges encountered during data collection. A number of patients became emotionally distressed when discussing their illness and personal experiences, leading to the discontinuation of interviews, and were referred for counselling. The researcher had made an arrangement in order to uphold ethical research standards and safeguard participant well-being. Additionally, some patients were too physically unwell to participate fully due to the severity of their condition, treatment side effects such as fatigue, pain, or weakness, and general clinical instability.

Other contributing factors included reluctance to participate due to the sensitive nature of cancer-related discussions, as well as anxiety, fear, or stigma associated with the disease. Time constraints during clinic visits also limited participation, as some patients had to attend multiple service points or were called for consultations, procedures, or treatments before interviews could be completed. In some cases, patients withdrew consent either before or during the interview process. Logistical challenges such as long waiting times, transportation constraints, and the need for patients to return home early further reduced participation. Additionally, some eligible patients were accompanied by caregivers who declined participation on their behalf due to concerns about fatigue or emotional burden.

Convenience sampling was used to recruit cancer patients for this study. This sampling technique was considered appropriate due to several contextual and practical considerations; the choice of convenience sampling was necessitated by the fact that some patients experienced fatigue, pain, and other treatment-related side effects, which limited their ability to participate in lengthy or scheduled research procedures. Therefore, recruiting patients who were accessible and in a suitable condition to participate ensured ethical and practical feasibility. Time constraints within the clinical environment further justified the use of convenience sampling. Patients often have limited time during clinic visits due to multiple service points, long waiting times, and scheduled consultations. Convenience sampling allowed the researcher to efficiently identify and engage participants without disrupting routine clinical services.

The use of convenience sampling and the selection of a single oncology clinic(referral centre) for this study may introduce the possibility of sampling bias. Convenience sampling involves selecting participants based on their availability and willingness to participate, which may result in the exclusion of individuals who attend the clinic at different times or those who are too ill or otherwise unable to take part in the study. As a result, the sample may not fully represent the broader population of cancer patients.

Participant recruitment was carried out with the assistance of the nurse in charge at the oncology clinic on a daily basis. The nurse facilitated the initial screening and assessment of patients attending the clinic to identify those who met the study's inclusion criteria.

Patients who met the inclusion criteria were sensitised about the study by the researcher and subsequently referred to the researcher. Upon referral, the researcher provided a detailed and comprehensive explanation of the study, including its purpose, procedures, and potential benefits. Participants were also informed that their participation was entirely voluntary, that they had the right to withdraw from the study at any stage without any consequences, and that refusal to participate would not result in any form of victimisation or affect the care they receive. Following this explanation, the informed consent process was conducted in accordance with ethical research guidelines. Only participants who provided voluntary written consent were included in the study. Data collection was then carried out through interviews with consenting participants. This recruitment and data collection process was repeated continuously until the required sample size was achieved.

Below is a screenshot of the RAOSOFT sample size calculator software used.

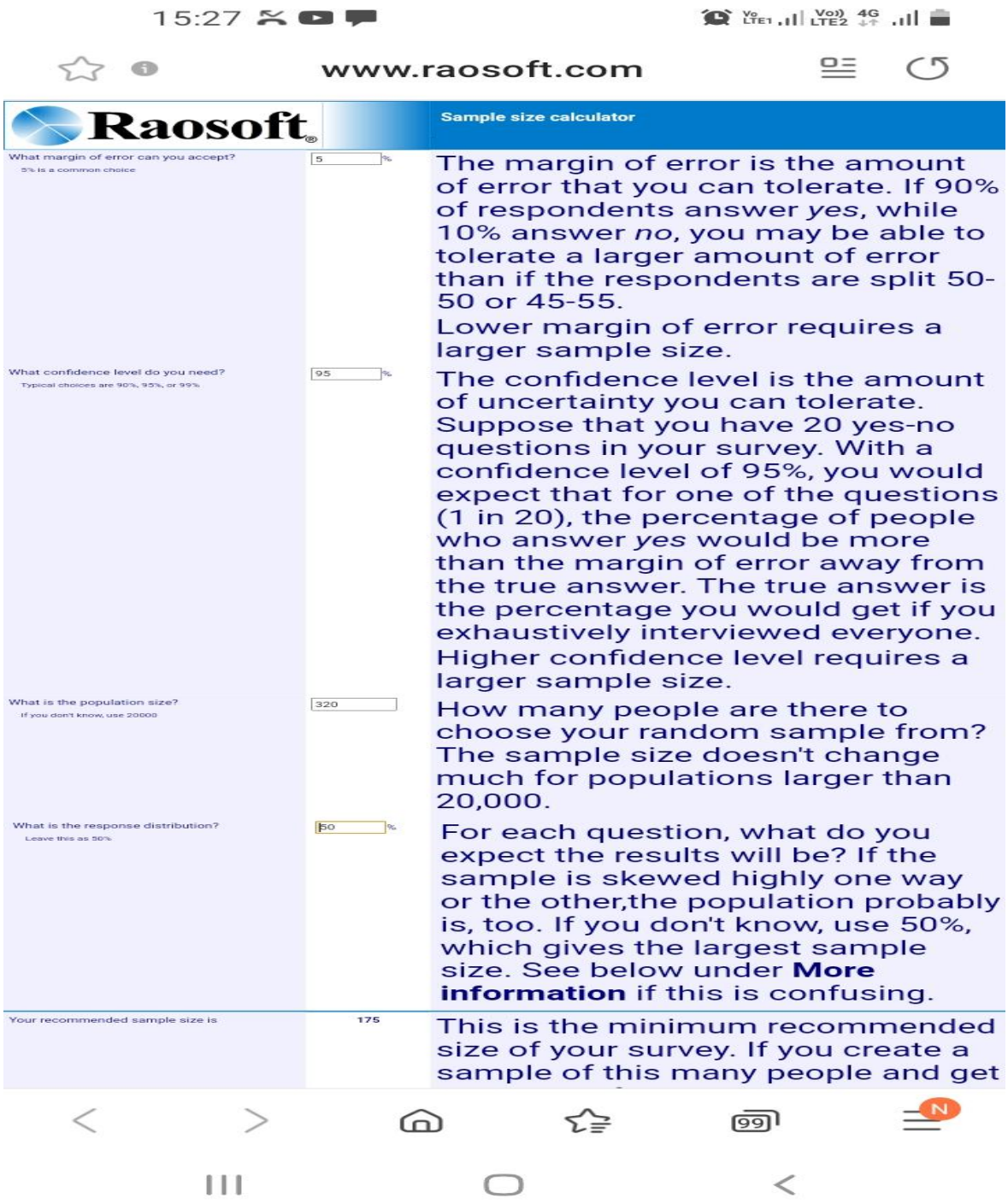


Figure 3.1: RAOSOFT sample size calculator software used to calculate sample size for cancer patients (www.raosoft.com)

3.9.4 Inclusion and exclusion of cancer patients

3.9.4.1 Inclusion Criteria

The following inclusion criteria applied to cancer patients:

- All men and women aged 21 years and older.
- Histologically confirmed diagnosis of cancer.
- Registered at the Oncology Clinic in Princess Marina Hospital
- Not critically ill.
- Mentally stable.

In this study, the minimum consenting age was set at 21 years instead of 18 years for several methodological and ethical reasons. Although 18 years is widely recognised as the legal age of adulthood, cancer incidence is relatively low among younger populations, particularly those below 21 years. Most cancer cases occur in adults, with higher prevalence observed in middle-aged and older individuals. Therefore, setting the minimum age at 21 years increases the likelihood of recruiting participants with relevant lived experiences of cancer, thereby improving the quality and relevance of the data collected.

3.9.4.2 Exclusion criteria

- Any cancer patient who did not seek health care services from public clinics.
- Those who were physically or mentally incapacitated.
- Those who were critically ill or in severe pain.

3.9.5 Data collection instrument

The adopted EuroQol EQ-5D questionnaire (Annexure D) was developed by the EuroQol Research Foundation (2008) and used with permission. The instrument is readily available in the public domain, and permission was sought from the developers (Appendix 4). EQ-5D questionnaire was validated by Dams, Rimane, Steil et al. (2020) in a study on Reliability, Validity and Responsiveness of the EQ-5D in Assessing and Valuing Health Status in Adolescents and Young Adults with Posttraumatic Stress Disorder: a Randomised Controlled Trial, and a test-retest reliability confirmed that EQ-

5D index values remain stable in unchanged health states, with high intraclass correlation coefficients ≥ 0.76. Internal consistency, noted in some studies, e.g., adolescents with PTSD had ICCs between 0.65-0.91 for index and 0.71-0.87 for EQ-VAS (Dams et al. 2020; Seng, Kwan, Fong, Phang et al. 2020:82).

The responsiveness of the EQ-5D was calculated by mean differences, effect sizes and receiver operating characteristic (ROC) analyses for participants with improved symptoms, and participants reported significantly more problems on the dimensions; “mobility”, “usual activities”, “pain/discomfort” and “anxiety/depression” than the general population (Feng, Kohlmann, Janssen et al. 2021: 56). For construct validity, EQ-5D index and EQ-VAS strongly correlate with measures of global health, physical functioning, pain, and activities of daily living (Feng et al. 2021: 56-58). Therefore, the questionnaire was found to be valid and relevant for assessing cancer patients’ outcomes and quality of life in relation to services received at their primary healthcare clinics. The questionnaire had three sections: Section A: demographic factors; Section B: patient outcomes; cognitive and emotional aspects of cancer patients, quality of life; side effects of cancer, health experience and state, patient outcomes, and lifestyle factors, social and material context; and Section C: rating of healthcare services received by cancer patients on a scale of 1 to 10. The items in Section B of the questionnaire align with the Patient-Reported Outcome Measure conceptual framework and have been discussed within it.

3.9.6 Data collection

Data collection refers to the systematic process of gathering and measuring information on variables of interest to address specific research questions. Cohen, Manion, and Morrison (2018) describe it as a systematic process in which researchers collect empirical evidence to support their study. For this approach, an EQ-5D questionnaire (3.9.7) was used to collect data from cancer patients. They were recruited and underwent informed consent as discussed below (3.9.8.1).

3.9.6.1 Process of obtaining informed consent

Informed consent in research is a “voluntary” agreement to participate, and it is the basis for ethical research. For this study, the process entailed the participant understanding what the research was all about: the purpose, the methods to be followed,

and the benefits and potential risks, if any (Shahnazarian et al. 2020:62). For this study, informed consent was obtained from all participants through face-to-face meetings. The process entailed explanations of the study's purpose, data collection procedures, and assurances of confidentiality and safe data handling and storage. The participants were then given a consent form to read on their own in the language they preferred and understood (which is Setswana) (Annexure F). Then, after reading, the participant signed in the presence of a witness and the researcher. The consent forms were given a code that linked to the questionnaire. The researcher then collected the signed consent forms and proceeded with interviews. Detailed process of informed consent in 3.9.9.2

3.9.6.2 Recruitment and data collection

Cancer Patients: Recruitment occurred concurrently with data collection for 6 to 8 months.

Step 1: Determining eligibility/screening for inclusion:

The researcher identified a mediator or mediators at the site, and the nurses in charge were the ones identified. A meeting was arranged between the researcher and selected outpatient oncology clinic staff at PMH to review the inclusion criteria as indicated in Section 3.9.5 above, and discussed during the meeting were: aim of the study, objectives, informed consent, and the tool, for oncology staff to appreciate that indeed the questions are based on the services patients receive at the primary care settings and not the oncology clinic. These clinical staff screened potential participants by reviewing outpatient medical records and the oncology clinic's registers to determine whether the patient met the inclusion criteria and was not under any physiological or psychological distress, as may be caused by the stage of cancer. Once the oncology clinic staff identified potential participants, they began a conversation about the study. If the patient showed interest, the next stage followed.

Step 2: Recruitment

After introducing the study, the mediator nurse in charge asked the patients whether they were willing to hear more about the study from the researcher. If they did, the researcher took over, explained the study and the informed consent process, and, if

they showed interest in continuing, the patient and the researcher moved to a private place that had already been identified during the initial meeting with staff. Then the consent process took place during this meeting, and if the patient agreed, a single face-to-face interview then followed. The interview took approximately 45 to 60 minutes.

The interviews of consenting participants prioritised clinical workflow and did not interfere with data collection. Some patients agreed but preferred to be interviewed at home; contacts, addresses, and appointments were noted, and they were followed up on agreed dates at their preferred times. Those who were not interested in participating were thanked for their time and reminded that this would not victimise them or affect them in any way.

3.9.6.3 Informed consent

Participants who met the inclusion criteria provided written, signed informed consent for research involving human subjects. This was done in a private location. The participants were given a copy of the informed consent form in their preferred language, Setswana or English. The researcher then went through the informed consent with the participants, reading it aloud. The potential participants were informed about the main purposes of the study, that participation was voluntary, that they were free to stop the interview at any time, and that there would be no consequences for them if they decided not to participate.

Participants were informed that there was minimal risk associated with participating in the study and that, if they experienced any distress related to the study, they would be referred to the relevant clinician (clinical psychologist) for assistance. The informed consent form also included contact details for the researcher and the IRB of the Botswana Ministry of Health, in case the participant had any questions or wanted to raise a complaint regarding the study. After reviewing the informed consent form with the participants, they were given time to ask questions, and their questions were answered to their satisfaction. Those who preferred more time before consenting were allowed to do so. They were provided with a copy of the consent form for further review, and arrangements were made to finalise the process at a later date.

3.9.7 Data analysis

Data analysis for this mixed-method study was conducted separately, and the results were integrated to present a single outcome from this study. Mixed-methods research involves collecting and analysing both quantitative and qualitative data, then engaging in further analysis by drawing insights from the connection between the two databases (Creswell & Inoue 2024). The analyses for the two approaches are presented in 3.9.1 and 3.9.2, respectively.

3.9.7.1 Qualitative data analysis

Qualitative data analysis is the interpretation of data to produce summary statements (themes), as in this study, to reveal what is represented in the data (Mezmur 2020). The thematic analysis steps outlined by Braun & Clarke (2022:3-26) were used for this study. Data analysis is a systematic and rigorous process that involves examining and interpreting data collected to identify patterns, themes and meaning to understand the phenomena under study (Creswell & Poth 2024). The audio-recorded interviews were transcribed and analysed inductively using thematic analysis (Clarke, Braun & Hayfield 2015). The researcher utilised the Braun and Clarke (2019) approach, which involves six phases of analysis.

In the first step, the researcher was responsible for verbatim transcription and data analysis. The field notes were used to complement the data to be analysed. Once the data had been transcribed, the researcher and an independent coder who signed a confidentiality declaration, experienced in qualitative research, reviewed the transcripts several times to familiarise themselves with the data and to get a sense of the whole. In the second step, the researcher and the Co-coder inductively generated initial codes for each interview and compared them to identify recurring codes (Clarke et al. 2015). In step three, all identified codes were organised into significant categories before each group was given a specific theme or subtheme (Braun & Clarke 2019). In the fourth step, after coding all relevant data items, the researcher shifted focus from the interpretation of individual data items within the dataset to the interpretation of aggregated meaning and meaningfulness across the dataset. In step five, the researcher combined data that had similar meanings to form final themes and subthemes (Elo & Kyngäs 2008; Braun & Clarke 2022).

Then, a review of themes in relation to the coded data items and the entire dataset was done. In the final phase, the researcher descriptively named each theme in relation to both the dataset and the research question. Overlaps and repetition were cleared, and merging was performed to avoid redundancies.

3.9.8 Trustworthiness of the study

Trustworthiness is the degree of confidence qualitative researchers have in the data (Polit & Beck 2021). It refers to the extent to which the study's findings reflect the context in which the data were collected. To ensure trustworthiness, the researcher demonstrated thoroughness, thereby ensuring credibility, transferability, dependability, conformability, and authenticity.

3.9.8.1 Credibility

Credibility refers to the process of ensuring that the data collected and the analysis procedures accurately reflect what the study participants expressed, both verbally and nonverbally. It can be conceptualised as true data. Credibility in qualitative research is generally ensured through prolonged engagement, persistent observation, triangulation, and member checking. For this study, the co-coder was engaged, and the themes emerging from the researcher and the co-coder were compared for credibility. In addition, the researcher triangulated through a thorough literature review to ensure the credibility of the data (Korstjens & Moser 2018:122).

3.9.8.2 Transferability

Transferability refers to the extent to which study findings can be applied in another setting and yield the same results (Polit & Beck 2021:560). Transferability depends on the detailed thick descriptions of the data collected from the study participants. To ensure transferability of results, data were collected from nurses working in primary care settings/clinics, and because clinics of the same level are resourced the same way throughout the country, the results of this study may apply to other clinics with the same resources (workforce, equipment, and providing similar services).

3.9.8.3 Dependability

Dependability is related to consistency and is a process that assures that acceptable standards aligned with a particular analysis are followed (Korstjens and Moser,

2018:122). It refers to evidence that is consistent and stable (Polit and Beck 2021:175). For this study, dependability was ensured through an audit trail. The processes followed in conducting the study were documented in detail to allow the reader to fully assess the extent to which the research process was followed. The researcher described the study objectives and methodology. Other documents, including field notes, transcribed scripts, and voice-recorded tapes, can be made available for scrutiny.

3.9.8.4 Confirmability

Confirmability is the objectivity or neutrality that shows the degree to which study results can be substantiated by others (Polit & Beck, 2017:723). It assists in controlling researcher bias. In this study, the researcher ensured that the data represented participants' information and interpretations and were not invented by the researcher. For this study, confirmability was assured through an audit trail. The researcher has documented the study processes and findings comprehensively so that, in the future, other researchers can also draw their own interpretations and conclusions based on the researcher's audit trail. The researcher's supervisors were also consulted throughout the data collection and analysis process to ensure dependability and confirmability.

3.9.8.5 Authenticity

Authenticity refers to the degree to which the researcher has extensively described the realities of the study or research process in a manner that is fair and honest (Polit and Beck 2021:559). The study captured rich descriptions of the context, namely the perceptions/views of nurses at the clinics regarding cancer service delivery, which were verified by the co-coder and the study participants.

3.9.9 Quantitative data analysis

The data were analysed using SPSS Statistics (version 27). A statistician was engaged for a quantitative approach and signed a confidentiality declaration. Demographic data were analysed using frequency tables and pie charts to understand the distribution of the sample in percentages and to describe what the data show. Inferential statistics were used to measure relationships and differences in data to make predictions or generalisations about the population from a sample (Polit & Beck 2021:182). For this study, a chi-square test was used to determine whether observed

differences between groups are statistically significant, and Spearman's rank correlation was used to determine the correlation between pairs of constructs.

Furthermore, Cronbach's Alpha was used to assess the internal consistency of items within each construct of the questionnaire to determine reliability. Cronbach's Alpha was interpreted according to the benchmark described by Montshiwa and Moroke (2014). The accepted value of Cronbach's alpha is 0.70 to 0.95, indicating a high level of significance. Then, confirmatory factor analysis was used to assess the validity of each construct by determining whether each item significantly belongs to the construct to which it was allocated in the questionnaire.

Following the reliability and validity tests, clustered bar charts were used to present patients' responses by construct, and Spearman's rank correlation was used to assess correlations between pairs of constructs. In addition, Structural Equation Modelling was used to assess the collective relationships among the independent variables and the dependent variable, verifying whether the data conform to the theoretical structural framework or whether an updated structural model unique to this study could be developed. The chi-square test, as indicated above, was used to determine the association and to compare the constructs and responses across demographic variables. Detailed findings will be presented in Chapter 4.

3.9. 10 Ensuring rigour

3.9.10.1 Validity and Reliability

Validity refers to **the** degree to which a research instrument accurately measures what it's intended to measure (Polit and Beck 2021). It concerns the quality of an instrument so that inferences made in a study are accurate.

Reliability and validity are concepts used to evaluate the quality of research. They indicate how well a method, technique, or test measures a given quantity. Reliability is about the consistency of a measure, and validity is about the accuracy of a measure (Heale & Twycross 2015). Reliability of the data collection instrument was assessed using Cronbach's alpha. Cronbach's alpha coefficient method was used to evaluate the internal consistency of the items to ascertain if the items measure the same trait (Polit & Beck 2021:82). Coefficient values of the Cronbach alpha range between 0 and

1. The Alpha value was computed by calculating the variance of each item on the questionnaire and then computing an average (mean) variance for all items.

Below is an illustration of how Cronbach's alpha coefficients are interpreted in terms of internal consistency.

Table 3.1: The Classification of Cronbach's Alpha Coefficient

Cronbach's Alpha Coefficient	Interpretation of Cronbach's Alpha Coefficient
≥ 0,9	The internal consistency of the items is high,
0,7 ≤ α < 0,9	The items have internal consistency,
0,6 ≤ α < 0,7	The internal consistency of the items is acceptable,
0,5 ≤ α < 0,6	The internal consistency of the items is weak,
α ≤ 0,5	The items have no internal consistency.

Adopted with modifications from (Sürücü & Maslakci 2020).

In this study, content validity was used to ensure the instrument's validity. According to Polit and Beck (2021:82), this type of validity assesses how well the questionnaire items represent the constructs being measured, evaluating whether they are relevant to the study. Content validity was further measured through expert review.

3.9.11.2 Internal validity

EQ-5D questionnaire was adopted from EuroQol Research Foundation and therefore was validated by Dams et al. (2020) in a study on Reliability, Validity and Responsiveness of the EQ-5D in Assessing and Valuing Health Status in Adolescents and Young Adults with Posttraumatic Stress Disorder: a Randomized Controlled Trail, and a Test-retest reliability confirmed that EQ-5D index values remain stable in unchanged health states, with high intraclass correlation coefficients ≥ 0.76

This was determined through multiple validation studies conducted across 34 countries (EuroQol Research Foundation, EQ-5D guidelines 2019). The tool also reflects

the patient's reported outcome theoretical framework components used to assess patient outcomes, which served as the study's framework.

3.9.11.3 External validity

External validity refers to how well the study's results are expected to apply to other settings. Feedback given by cancer patients on services provided by Nurses working in primary care settings/clinics, and the views of nurses on cancer service delivery in clinics can be used to represent what transpires there, because clinics of the same level are resourced the same way throughout the country, the results of this study maybe applicable to other clinics with the same resources (human resources, equipment, and providing similar services).

3.9.11.4 Reliability

Construct reliability was confirmed using Cronbach's alpha coefficients, which ranged from 0.60 to 0.78; these are reported to be within acceptable values (Tavakol & Dennick 2011:53-55). The tool adopted for the study has been used in several studies to measure patient outcomes and provide feedback on services, and is reported to be reliable and adaptable across various health care settings. The researcher clarified areas where participants seemed challenged to elicit appropriate responses. The researcher and a trained research assistant were solely responsible for collecting data. The researcher was responsible for data collection, and a statistician conducted data analysis. There was an arrangement with a clinical psychologist to refer clients who might become overwhelmed by emotions when responding to certain items. All the participants went through the interviews without being overwhelmed by emotions. Arrangements were made with the psychologist at the district hospital for intervention if any questions might trigger painful emotions.

3.10 ETHICAL CONSIDERATIONS

This followed approval of the study by the University of South Africa Health Research and Ethics Committee (UNISA HREC) and Unisa College of Human Science Ethics Committee (University of South Africa) NHREC Registration #: Rec-240816-052 CREC Reference #: 11383372_CREC_CHS_2021(Annexure A). This study was conducted in Botswana, and recruitment commenced following ethical clearance from the Botswana Ministry of Health Research and Ethics Review Board (ref. HPRD:6/14/1;

Annexure B). Permission was sought from the Primary Healthcare clinics. The researcher met with a nurse in charge at each selected clinic to inform them about the upcoming study and share its details.

Potential participants were recruited by the mediator and researcher through word of mouth and via a flier that outlined the study topic, purpose, data-collection period, and the researcher's contact information (phone number and email address). Those interested in the study met with the researcher at a time convenient for them and received additional information, including the procedure for signing the consent form. The researcher then further elaborated on the study aims, objectives, and expectations, and clarified any issues raised. Participants were informed that participation in the study was voluntary, and they were given a consent form to sign to confirm their understanding of the study and agreement to participate. The potential participants were given 30 minutes to 1 hour to read the study information, including the consent form, and to sign it. This was done in the presence of a witness, one for the participant and one for the researcher.

3.11 Mixed Method Integration

Mixed-methods integration refers to the systematic process of combining qualitative and quantitative data within a single study to provide a more comprehensive understanding of the research problem. In this study, integration was achieved through a concurrent mixed-methods design, where both qualitative and quantitative data were collected during the same phase of the research process.

The integration of data occurred at multiple stages of the study. Firstly, at the data collection stage, information was gathered simultaneously from cancer patients and nurses within the same primary healthcare settings. This allowed for the alignment of datasets and ensured that both perspectives were captured within a shared context of cancer service delivery.

Secondly, integration was carried out during the data analysis stage. Quantitative data provided measurable indicators of patient-reported outcomes, such as access to services and perceived quality of care, while qualitative data generated detailed insights into patients’ experiences and nurses’ perceptions. These datasets were compared and analysed to identify areas of convergence, divergence, and complementarity.

Finally, integration was achieved at the interpretation stage, where the findings from both qualitative and quantitative strands were merged to produce a coherent understanding of the phenomenon under study. This process facilitated triangulation, enhancing the validity and credibility of the results. Quantitative findings explained the extent to which issues existed, while qualitative findings provided explanations for why and how these issues occurred.

Overall, the integration of mixed methods enabled a holistic and contextually grounded understanding of cancer service delivery. By combining numerical data with experiential evidence, the study was able to identify gaps between service provision and patient experiences, thereby informing the development of a comprehensive and patient-centred programme for cancer care in primary healthcare settings.

3.12 CHAPTER SUMMARY

The chapter discussed the design and methods that guide the study, including the researchers' philosophical stance and its impact, the methods and design, and the different phases of the study. Chapter four presents the study's findings in alignment with the stated objectives.

CHAPTER 4: DATA ANALYSIS AND PRESENTATION OF FINDINGS

4.1 INTRODUCTION

The previous chapter discussed research methods and design that guided the study, philosophical assumptions, ontology, and the researchers' philosophical assumptions, followed by the methods and design used to guide the study. This chapter discusses data management, analysis, and the findings and discussion based on the literature review.

4.2 DATA COLLECTION AND ANALYSIS

4.2.1 Phase 1: Qualitative and quantitative approaches

4.2.1.1 Data management

To ensure the privacy and confidentiality of patient information, all collected data were stored on a password-protected computer, accessible only to the researcher, and kept strictly at her home to maintain data safety and confidentiality. The researcher transcribed all interviews and the recordings of the focus groups, which were three groups consisting of eight (8) to twelve (12) participants each. The researcher facilitated focus group discussions, maintained neutrality, and probed. Probing is a purposeful technique used by interviewers to obtain richer, deeper, and clearer information from participants.

A research assistant signed a confidentiality agreement, and this was explained to participants as part of obtaining their consent. The researcher was responsible for analysing the data; however, a co-coder also signed a confidentiality declaration (Appendix 6) and was involved for quality purposes and to validate the analysed data.

Participant demographics were entered into an Excel spreadsheet. Following transcription and data analysis, all electronic documents were transferred from a computer to an external hard drive, which was also password-protected. The hard-copy documents, such as the interview guide and informed consent forms, were also locked away. Upon completion of the study, the dissertation will also be saved and stored on an external hard drive, and all gadgets are currently stored in a locked cupboard in the

researchers' office at the University of Botswana, School of Nursing, where the researcher is currently working.

4.2.2 Analysis of qualitative data

The purpose of data analysis is to summarise, classify and interpret verbal or visual data to derive meaning and make valid inferences from what is coming out of data to produce knowledge and new insights (Elo, Kääriäinen, Kanste, et al. 2014; Creswell et al. 2024). However, the process was not linear, as the researcher had to move back and forth between data segments to confirm whether the meanings still represented the phenomena being studied.

Data analysis was conducted simultaneously with data collection. This involved collecting and analysing data from the focus group discussions as data collection continued (Creswell 2018). Qualitative data analysis began during data collection and involved collecting and recording data, verbatim transcription, data coding, identification of major themes, and patterning (Polit and Beck 2021). Verbatim transcription entailed transcribing information from focus group discussions without altering the meaning as the stories unfolded (Annexure 6). The field notes collected were also integrated into the data to be analysed. Thereafter, a meeting was organised with a co-coder, a colleague with research experience, to discuss the themes and categories and reach a consensus. A confidentiality declaration agreement was signed by the co-coder

Thematic analysis was conducted according to Braun & Clarke (2019), in which data were analysed inductively using thematic material. Braun and Clarke's (2019) approach involves six stages, referred to as the phases of analysis. In the first stage, the researcher analysed the qualitative data, and the co-coder validated it. In the second stage, the researchers inductively generated initial codes for each interview and compared them to identify recurring codes. All identified codes were organised into meaningful categories before each group was assigned a specific theme or subtheme (Braun & Clarke 2019). After coding all relevant data items, the researcher shifted focus from interpreting individual data items within the dataset to interpreting aggregated meaning and meaningfulness across the dataset. Then, the combined data that had similar meanings were formed into themes and subthemes (Elo & Kyngäs 2008). The researcher conducted a recursive review of themes in relation to the coded data

items and the entire dataset. The researcher and co-coder were critical in identifying real themes, their quality, overlaps, completeness, and diversity. Finally, each theme was descriptively named in relation to both the dataset and the research question.

Four (4) themes and thirteen (13) subthemes emerged from the data analysis. The themes are: (1) Lack of knowledge and skills on cancer management, (2) delays in diagnosis of cancer, (3) need for support to cancer patients, and (4) programme to guide nurses in primary healthcare clinics, and the subthemes are presented in Table 4.3 under findings.

4.2.3 Findings

The qualitative findings are presented according to the participants' demographics (Table 4) and the themes that emerged (Table 4.1).

4.2.3.1 General characteristics of the participants (nurses)

Table 4.2 General characteristics of the participants (n = 32)

Characteristic	n = 32
Gender	
Male	13
Female	19
Age	
30-34	5
35-39	8
40-44	5
45-49	7
50-54	4
55-59	2
60 +	1
Educational Level	
RNs Dip	19

RNs Degree	13
RNs Masters	0
PhD	0
Village/Workplace	
Kanye	12
Molepolole	12
Ramotswa	8
Number of Years Working at Clinic	
0 to 6 months	0
>6 months to 1 year	3
>1 year to 3 years	10
>3 years to 5 years	12
>5 years and above	7
Total	32

Thirty-two participants (n = 32) were in three focus groups, one per study site: Kanye (n = 12), Molepolole (n = 12), and Ramotswa (n = 8). All participants were interviewed in English, as all nurses can communicate in English. The participants' ages ranged from 30 to 60 years. The focus group discussions were conducted at the clinics in the study sites on days preferred by the nurses in charge and organised by the nurses in charge. The participants were registered nurses at different levels: RNs with a diploma (n = 19), RNs with a bachelor's degree (n = 13), and none with a master's or doctoral qualification. The participants had all consented to be interviewed.

4.3 THEMES AND CATEGORIES THAT EMERGED FROM THE STUDY

Four main themes and 13 categories emerged (Table 3). These were (1) Lack of knowledge and skills on cancer management, (2) delays in diagnosis of cancer, (3) need for support to cancer patients, and (4) a programme to guide nurses in primary healthcare clinics.

Table 4.2: Themes and categories generated from the study

Themes	Categories
Lack of knowledge and skills in cancer management.	Need for in-service training on cancer management. Need for a programme or guidelines to guide non-oncology trained nurses on cancer care.
Delays in the diagnosis of cancer.	Patient factors: Delays in seeking medical services. Associating cancer with traditional causes. Associating a cancer diagnosis with death, leading to delays in coming for results. Health facility/System factors: Lack of equipment; specimens sent to a central laboratory. Delayed turnaround time for results. A long waiting period to be attended by an oncologist.
Need for support for cancer patients.	Need for ongoing counselling for patients and caregivers. Need for community outreach services by clinics. Need for resources in clinics to support cancer patients at home.
Programme to guide nurses in primary healthcare clinics	Cancer awareness workshops and in-service training. Need for guidelines on cancer treatment.

Nurses who participated in the study unanimously agreed that cancer cases are on the rise, and they assert that cancer patients come to their clinics with the hope of being provided with the services they need. From the study, 4 themes and 13 categories emerged and are presented below.

4.3.1 Theme 1: Lack of knowledge and skills on cancer management

The nurses in the study felt unequipped to provide appropriate care to cancer patients. Hence, they managed them like all other patients, even though they were of the view that cancer patients need more comprehensive care, inclusive of ongoing counselling

and support, together with their caregivers, which they are unable to do. The categories that emerged under this theme were: 1) need for in-service training on cancer management, 2) need for a programme or guidelines to guide non-oncology trained nurses on cancer care. Below are the category explanations and supporting excerpts.

4.3.1.1 Category 1: Need for in-service training on cancer management

Most nurses (n = 30 out of 32) interviewed indicated that they had no exposure to cancer management during their training; they do not have any skills in managing cancer, and therefore, they treat cancer patients like any other patient. The following narratives support this:

> *"In this clinic we do not really provide care to cancer patients accordingly because we do not have the knowledge and skills! Our training did not prepare us that much..* (*doubt), we never even went for practical in an Oncology setting like we did with other adult conditions (emphasising), and for us to provide better care to cancer patients we need workshops, some kind of in-service training on cancer management" (KO1)*

> *"The Ministry of health does not support cancer care in clinics" nurses in clinics do not know anything about cancer care! (emphasizing), we do not have much knowledge about cancer, we cannot go on like this, cancer patients are increasing every day!, we need training to deal with this situation" (MO6)*

> *"We usually provide care like for all other patients because cancer specialized care is in Princess Marina Hospital and Nyangabgwe Referral Hospital (cancer care is centralised in these two government referral hospitals), heish!!, yes!! we have a serious problem in clinics because these health facilities are first point of entry for any client, and we supposed to know how to go about asking the right questions so that we can refer on time, and this doesn't really happen, mm!(affirming) " (R03)*

The participant further narrated that:

> *"Anyway, maybe the newly qualified will come prepared because we hear that the current curriculum for bachelor's degree has a whole course on Oncology*

and Palliative care, but for us who didn't train under this curriculum, we need to be capacitated through workshops on cancer " (R03)

4.3.1.2 Category 2: Need for a programme or guidelines to guide

The nurses indicated the importance of standardising the management of cancer in primary healthcare clinics through a programme or guidelines. They indicated that conditions managed through programmes lead to positive patient outcomes because care is standardised. The following narratives support these:

> *"Yes, there is a need for a program to facilitate cancer care, prevention, treatment and follow-up" (M10)*
>
> *"We need something like a flow chart or flow diagram like it's happening with malaria, which indicates how we should go about to triage patients and manage them accordingly! (emphasising!) this will guide nurses on cancer management and hence referral for early diagnosis and treatment, and ongoing management at home ". (M06)*
>
> *"Yes, there is a need for a program, all programs have some charts (implying flow charts) which show how assessment should be done to arrive at a correct diagnosis." (K05)*
>
> *"We need a program to guide us and very urgently!! because I feel we are missing out on diagnosing cancer early" (R01)*

Nurses expressed serious concern about the lack of support to close the skills gap they are experiencing. The lack of formal oncology training while providing care to cancer patients means they require in-service training to improve the quality of care, patient outcomes, and their own confidence and competence.

4.3.2 Theme 2: Delays in diagnosis of cancer

According to nurses who participated in the study, delays in diagnosis of cancer are attributed to different factors and this came up as categories under this theme as; i) patient related factors which were pointed out as; delays in seeking medical services; associating cancer to traditional causes; associating a diagnosis of cancer to death thus leading to delays in coming for results; and ii) Health facility/system related factors

were; indicated as lack of equipment specimen sent to a central national laboratory; and delays in turnaround time for results; and long waiting period to be attended by an oncologist. Narratives from participants support these:

4.3.2.1 Category 1: Patient Related Factors

"Patients fear a diagnosis of cancer, and take long to come for their results,….hah! for example, we had one patient here (in the clinic) who later got a diagnosis of cancer of the oesophagus, the patient was referred to the local hospital for a biopsy but because he heard that there was suspicion of cancer he went and took long to come for results, and by the time he came he was very weak" (M07)

"Patients tend to associate cancer with traditional causes, so once they get advised to do a biopsy to rule out cancer they will start going to traditional Healers and would delay coming for results." (K06)

"Generally, patients come to clinics with advanced stage cancer, and majority do not survive, they die!! and this causes fear among other patients, once they are diagnosed with cancer , they think it's the end of life for them, so they usually stay away and not come for results, and this leads to delays in diagnosis and initiation of treatment" (R04)

4.3.2.2 Category 2: Health Facility Related Factors

"Heish… in clinics, there are usually delays, caused by lack of knowledge and skills which compromises decision making, because in most cases really..., we never think it could be cancer!(emphasising). the tendency is to give treatment for whatever the patient come complaining about (implying symptoms) …. and by the time the decision to screen for cancer is taken, the condition has advanced, and the results take long because the investigations are done at a central laboratory which caters for the whole southern region, and lab is centralised in Gaborone, and this causes further delays for clients to get results" (M05)

"The only screening I know is a pap-smear to rule out cervical cancer but other types of cancer I do not know how they present, and I do not know how to screen for them" (M04)

"There is a long waiting period for patients to see the oncologist with the results, this further causes delays in initiation of treatment" (R02)

These delays contribute to poorer patient outcomes and higher mortality rates, as patients often present with advanced-stage cancers requiring more aggressive treatments.

4.3.3 Theme 3: Need for support to cancer patients

Nurses reported a lack of resources in the clinics to facilitate support for cancer patients at their homes. The categories under this theme were: 1) need for ongoing counselling for clients and relatives, 2) need for community outreach services by the clinic nurses, and 3) the need for resources such as transport and consumables like nappies and dressing packs to support cancer patients at home.

The lack of resources in clinics to support cancer patients in communities was raised as one of the major concerns. The following narratives came up:

4.3.3.1 Category 1: Need for ongoing counselling for patients and caregivers

"If I can give an example, in Infectious Disease Control Clinic, that is a unit running HIV & AIDS care, they have patients' records and follow-up is easy, but for cancer patients, there are no records in the clinic and there is no report for cancer patients whom the clinic is supposed to follow up, hence there is very little done by nurses and doctors for cancer patients in the community. we only see them when they come to access services like dressings, or when they have run out of pain medication, or when they need materials like nappies or when they are distressed with side effects of chemotherapy, or when caregivers come enquiring about transport to oncology centre, yeah!! … my thinking is that this needs to improve, patients and caregivers go through a lot, counselling is very important" (M01)

"The clinic does not support cancer patients unless he/she comes to a clinic for services like wound dressing"(R03)

"We once had a client who came for dressing, he had cancer of the penis, the man was going through a lot, the wife left him, and he believed she bewitched

him, such cases need counselling by a palliative care specialist, and also intervention by a social worker" (K04)

4.3.3.2 Category 2: Need for community outreach services

"As nurses in this clinic we do not provide care to cancer patients accordingly and we do not do community outreach services to do follow ups at home because there is no transport" (M01)

"Cancer management requires support groups in the community, and to achieve this we need to mobilise communities, give them information of prevention, and on care of patients who are already diagnosed with cancer!, this can dispel the myths surrounding causes of cancer, the problem is the clinics do not get support to do these from the ministry of health. We submit the budget for outreach services, but we never get funded" (K03)

"Very sad we only reach out to communities during commemoration days, and these are usually supported by NGOs, and its once-a-year thing, and this is not enough!!" (R01)

4.2.3.2 Category 3: Need for resources to support cancer patients at home

"There are no resources to do home visits to support cancer patients" (KO2)

"Not much support is given to cancer patient, if there is need for things like nappies and if we have them in the clinic, that is when we can provide to caregivers or relatives who come requesting, otherwise because of lack of transport we do not provide follow up care" (R01)

"The clinics are struggling with transport to refer patients, as it is I do not see us being supported to do follow up visits to patients in their homes … mmm!! and cancer patients are increasing by the day, which may make it even more difficult" (M04)

Cancer patients require different types of support. A diagnosis of cancer is psychologically involving, and therefore ongoing support is very important from all interdisciplinary team members. Nurses should be prepared to understand this, because as the first point of contact, they need to know when to provide informational support, refer

for medical support and when to reach out to the family and community to mobilise and empower them to support cancer patients at home.

4.3.4 Theme 4: Need for a programme to guide nurses in clinics

Need for a programme to guide cancer management was pointed out as a concern by all nurses participating in the study. Two categories that came up: 1) Cancer awareness and in-service training, 2) Need for guidelines on cancer treatment. These were supported by the narratives below.

4.3.4.1 Category 1: Cancer awareness and in-service training

In-service training is important for generalist nurses to develop the specialised knowledge and skills needed to provide comprehensive and effective cancer care, leading to better patient outcomes, and this was supported by the following excerpts.

> *"Yes, there is a need for a program to guide cancer care in clinics, and it should take into consideration in-service training" (KO1)*
>
> *"Yes, a program can be helpful if we can have a program!!, it will assist us in clinics to integrate and standardize care to cancer patients" (KO2)*
>
> *"Yes, it will be very helpful like we have algorithms for STI' s management, but before these were issued to clinics, there was training, I really do not know why it has taken this long with cancer management" (K03)*
>
> *"Yes, we need a program it will delineate what has to be done and things like care definitions are very important."*

4.3.4.2 Category: Need for guidelines on cancer treatment

> *"Yes, there is a need for a program to facilitate cancer care, prevention, treatment and follow-up, like malaria program it has indicated even how to assess a patient and what to be on the lookout for and even treatment, so cancer treatment guidelines are very important" (M01)*
>
> *"Yes, there is a need for a program all programs have some charts which show how assessment should be done to arrive at a correct diagnosis, and how to proceed further with management, and even when to refer" (K03)*

“Clinics need a programme that can facilitate us to provide quality care to patients, including how to manage treatment side effects.” (R02)

Nurses collectively expressed the need for a programme to guide and facilitate their provision of quality care to cancer patients. This is viewed as a way to standardise patient care, improve patient outcomes, reduce errors and complications, and ultimately increase competence and confidence.

4.4 SUMMARY

The study's qualitative approach sought to address Objective 1, which was to explore and describe nurses' perceptions of cancer service delivery in clinics. Under this approach, three focus groups were conducted. Four main themes emerged; these themes had 13 categories. The study's qualitative findings, supported by participants' (nurses’) narratives, have been presented.

Next is a presentation of a quantitative approach to assessing cancer patients’ outcomes and quality of life in relation to services received from primary healthcare clinics. This approach presents findings on cancer patients’ accounts of services provided at the primary health care clinics. The findings of the two approaches are all under Phase 1 of the study.

4.5 QUANTITATIVE RESULTS

The quantitative approach presents the results obtained from structured interviews conducted among cancer patients, which sought to assess cancer patients’ outcomes, quality of life and satisfaction with the service received from primary health care clinics. A total of n = 135 cancer patients took part in the study, and the questionnaire was divided into three sections: Section A, demographic data; Section B, cognitive and emotional factors, lifestyle factors, social and material context, side effects of chemotherapy; and Section C, healthcare services characteristics and rating of services from 1 to 10. A statistician was engaged to guide questionnaire development and statistical analysis of this phase. He signed a confidentiality declaration agreement. The findings herein provide a quantitative view of the scope and impact of systematic concerns in cancer care, providing a background for the qualitative themes derived.

4.5.1 Demographic profile of the patients

Table 4.3: Cancer patients' demographic profile (n = 135)

Age					
		Frequency	**Percentage**	**Valid Percent-age**	**Cumulative Percentage**
Valid	31-35 years	1	0.7	0.7	0.7
	36-40 years	5	3.7	3.7	4.4
	41-45 years	6	4.4	4.4	8.9
	46-50 years	17	12.6	12.6	21.5
	51-55 years	23	17.0	17.0	38.5
	56-60 years	27	20.0	20.0	58.5
	61-65 years	32	23.7	23.7	82.2
	65 +	24	17.8	17.8	100.0
	Total	135	100.0	100.0	
Gender					
			Frequency	**Percentage**	**Cumulative percentage**
Valid		Female	93	68.9	68.9
		Male	42	31.1	100
		Total	135	100	

The highest percentage of participants was within the age group 61-65+ years (41.5%), followed by 56-60 years (20%), 51-55 years (17%), 46-50 years (12.6%) and 41-45 years and below (less than 5%). The majority of patients, 64.4% (n = 86), had tertiary education, followed by secondary at 18.5% (n = 24) and primary at 17% (n = 22). This implies that a vast majority are formally educated, which may play a big role in the management and understanding of the condition. As for occupation: 35.55% (n

= 48) had varied occupations, whilst a few (3.70%, n = 5) were unemployed; the largest group among them were retired, 60.75% (n = 82), and these were within the ages 56-65 years.

4.5.2 Cognitive and emotional aspects

Section B of the questionnaire included statements on cognitive and emotional aspects, lifestyle factors, as well as the social and material context, to determine whether patients had any prior information about cancer from their local clinics. Also, to assess whether they have any concerns about cancer and whether they are receiving any support from the clinics, families, or the community.

The majority of respondents (80%; n = 108) reported not receiving information on cancer from local clinics. Overall, it was found that local clinics were less effective at providing cancer information to patients. Of interest was that 69.6% (n = 94) of patients indicated to have received some information on cancer from other platforms, such as media, community programmes such as cancer commemoration days which comes once a year in October during which specific information on certain types of cancer such as cervical, prostate and breast cancers is made available through different communication media platforms such as public radio stations, national television, and other adverts and posters.

Regarding beliefs on the traditional causes of cancer, a total of 43% (n = 58) of participants disagreed with the traditional causes for cancer, and 40% (n = 54) of the participants were neutral, whilst 16.3% (n = 22) strongly agreed that cancer can be caused traditionally, such as through witchcraft and curses. Hence, there are both biomedical and traditional ways of viewing cancer, and this is evident in the way some patients would delay presenting at the clinic, as reported by nurses under qualitative results, that patients would further delay coming for results to confirm the diagnosis. The figure below indicates that the majority, 91% (n = 24), of patients with cancer are always concerned about their condition.

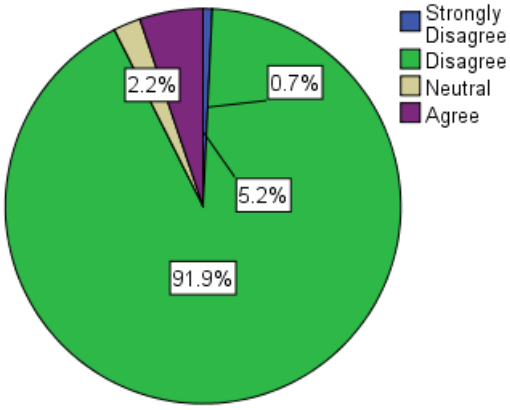


Figure 4.1: Patients' concerns about the condition

A vast majority of patients, 91.9% (n = 124), stated that their condition brings intense anxiety and fear, indicating that cancer is a psychologically involving disease. Despite the need for psychological support, primary healthcare clinics do not provide ongoing counselling as a form of support to cancer patients, as was also indicated by nurses. Hence, 90% (n = 124) of the patients continue to feel worried and sad about a cancer diagnosis, further indicating an important aspect of inclusion of mental healthcare in cancer management, across all levels of care.

On the aspect of coping and living with a diagnosis of cancer, the patients' responses are indicated in Figure 2 below.

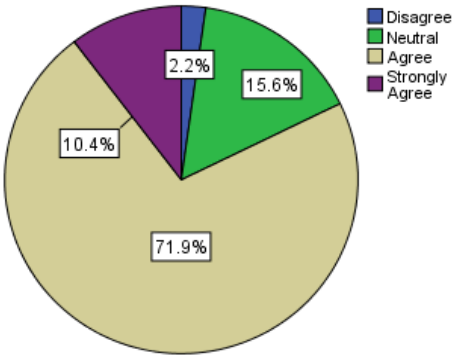


Figure 4.2: Coping and living with a diagnosis of cancer

Most (71.9%; n = 97) patients agreed that they have learnt to cope, while only 15.6% (n = 21) were neutral and 10.4% (n = 14) disagreed. This leads to the conception that

even though most patients can adjust, they remain largely impaired. Cancer is a psychologically involving condition and requires support through ongoing counselling.

As for acceptance of a chronic disease, 43.7% (n = 66) of the patients accepted their illness, while 53.3% (n = 72) of cancer patients had not accepted it, as they were thinking of witchcraft and curses as the cause. This variation indicated the need for a program that would help cancer patients become more emotionally adjusted to life during treatment and post-cancer care.

4.5.3 Lifestyle factors

Table 4.4: Patients' responses to statements on lifestyle modifications(n=135)

Item	Strongly disagree	Disagree	Agree	Neutral
Knowledge of the type of food to eat	2.2% (n = 3)	70.4% (n = 95)	10.4% (n = 14)	17.0% (n = 23)
Regular appropriate physical activity	0.7% (n = 0.95)	91.1% (n = 123)	6.7% (n = 9)	1.5% (n = 2)
Acquisition of information about the importance of diet and exercise from the local clinic	3% (n = 4)	92.6% (n = 125)	3.7% (n = 5)	0.7% (n = 0.95)
Able to perform daily household activities	-	25.9 (n = 34)	73.3% (n = 99)	0.7% (n = 1)

Most cancer patients, 92.6% (n = 125), reported that they never received information on diet and exercise (lifestyle modification) from their local clinics.

Regarding knowledge and type of food to eat by cancer patients, 70.4% (n = 95) reported not knowing the right diet following a diagnosis of cancer, suggesting that nutrition education and diet modification should form part of their care. Most cancer patients (91.1%; n = 123) did not engage in any form of physical activity. The results indicate that exercise is not given sufficient importance, reflecting a lack of continuous health information and other support programmes to facilitate recovery. The majority of patients, 73.3% (n = 99), had difficulties in carrying out some activities of daily living emanating from cancer-related fatigue, and exercise is important in reducing cancer-related fatigue and improving patients' quality of life.

4.5.4 Characteristics of treatment

Table 4.5: Patients' responses in relation to cancer treatment n = 135

Item	Strongly disagree	Disagree	Agree	Neutral
Side effects of cancer treatment affect most areas of well-being	1.5% (n = 2)	12.6% (n = 17)	85.9% (n = 116)	-
Support from the local clinic when experiencing side effects of treatment	1.5% (n = 2)	88.1% (n = 119)	10.4 % (n = 14)	0.7% (n = 0.95)

Most cancer patients, 85.9% (n = 116), stated that treatment side effects affected nearly all spheres of their quality of life; for example, it made them fatigued, and they were unable to take a bath without assistance, and some household chores that require long periods of standing, like preparing food for themselves, etc. This underscores the need for clinics to address such side effects adequately. 88.1% (n = 119) of the patients are not supported to manage the side effects of chemotherapy. This analysis underscores a major deficiency of clinic-based support services.

Other forms of support for patients were assessed; the table below shows the different types of support and patients' responses.

Table 4.6: Support available to cancer patients in their local communities

Item	Strongly disagree	Disagree	Agree	Strongly agree	Neutral	Total %
Social and material support provided by family	0.74% (n = 0.99)	6.67% (n = 9)	29.63% (n = 40)	62.96% (n = 84)	-	100% (n = 135)
Social and material support from friends	-	18.52% (n = 25)	46.67% (n = 63)	6.67% (n = 9)	28.15% (n = 38)	100% (n = 135)
Social and material support from community support groups	11.9% (n = 16)	83.0% (n = 112)	3.7% (n = 5)	-	1.5% (n = 2)	100% (n = 135

Support from nurses at the local clinic	1.5% (n = 2)	85.9% (n = 116)	10.4% (n = 14)	-	2.2% (n = 3)	100% (n = 135)
Support from doctors at the local clinic	1.55% (n = 2)	95.6% (n = 129)	2.2% (n = 3)	-	0.7% (n = 0.95)	100% (135)
Support from social workers at the clinic	3.7% (n = 5)	94.1% (n = 127)	0.7% (n = 0.95)	-	1.5% (n = 2)	100% (n = 135)

Regarding social and material support, 91.85% (n = 124) of cancer patients reported receiving support from their families, while 6.67% reported not receiving support from their families. Family support is critical for cancer management, and family caregivers should be supported and trained by local clinics in caregiving at home. Regarding support from friends, only 46.67% (n = 63) of cancer patients received support from friends; 28.15% (n = 38) had no opinion on friends' support; and 18.52% (n = 25) did not receive any support from their friends. On community support and engagement on cancer matters, the majority, 94.9% (n = 126) of cancer patients did not receive any form of support from the community in which they live, indicating a lack of community involvement in cancer prevention, also confirmed by nurses in primary healthcare clinics that they do not do community outreach to mobilise community on the prevention and management of cancer patients at home.

These findings from the study indicate a lack of community support for cancer-related health matters and mandate that healthcare workers, especially nurses in primary healthcare clinics, mobilise communities to invest time in empowering communities on matters of their own health. Furthermore, 85.9% (n = 116) of the patients reported not receiving any support from nurses at home. This is a serious anomaly in a country that has endorsed primary health care as a philosophy that guides its healthcare system. The lack of cancer support groups in the community shows a gap in the cancer management pathway in Botswana.

The findings in the quantitative approach are consistent with what nurses at primary health care clinics reported in the qualitative approach of the study as they reported that they do not have resources to support patients at home, and that in rare instances they could provide some materials like nappies to caregivers of patients, if they come

to the clinic to request, however, this depends on the availability of such resources. The lack of support for cancer patients cuts across all healthcare workers in primary health care clinics: 95.6% (n = 129) of patients reported not being supported by doctors, and 94.1% (n = 127) reported the same for social workers.

4.5.5 Healthcare services

4.5.5.1 Satisfaction with health services provided at the local clinic

Most cancer patients (73.3%; n = 99) reported dissatisfaction with services received at their local clinics, while only 3% (n = 4) were satisfied. Such dissatisfaction indicates deeper problems with service quality.

Below is a table showing how patients rated healthcare services.

Table 4.7: Mean rating of some healthcare services provided at the clinics

Areas for which services were sought	N	Minimum	Maximum	Mean	Std. Deviation
Feelings of fear and worry because of a cancer diagnosis	135	1.00	5.00	3.5630	.95110
Inability to take care of oneself because of frailty from the condition	135	2.00	6.00	3.7481	.99790
Discomfort from side effects of chemotherapy	135	1.00	5.00	3.5185	.87972
Receiving information continuously on cancer prevention, early detection, and management	135	1.00	5.00	3.0593	.88742
Ongoing psychosocial support	135	1.00	5.00	2.5481	1.05603
Pain management	135	1.00	6.00	3.2148	1.11560
Wound care	77	1.00	6.00	3.7792	1.13118
Loss of weight	135	1.00	6.00	3.4444	.95156

The rating of healthcare services by cancer patients was poor, at 3.34. Over 90% (n = 122) of the patients rated the healthcare services between 2.75 and 3.75, indicating poor quality of healthcare services.

Table 4.8: Reliability analysis of items under cognitive and emotional aspects, lifestyle factors, characteristics of cancer treatment, social and material support, and healthcare services

Items	Cronbach's Alpha	No. of Items
Cognitive and emotional aspects of clients	.684	4
Clients' lifestyle factors	.656	4
Characteristics of cancer treatment	.794	2
Social and material support	.522	3
Healthcare services	.658	8

Cronbach's alpha values for four out of five constructs were greater than 0.6, which indicates appropriate internal consistency (reliability of the constructs) (Eum, Sohn & Kim 2007). These imply that the items in those constructs measure related constructs; hence, the level of significance is high (above 0.6-0.7), except for the social and material support construct (0.522), which indicates inappropriate internal consistency (non-reliability). However, it may lack internal consistency, but it is a very important construct in the management of cancer. Confirmatory factor analysis (CFA) was also used to verify the validity of the constructs before presenting the participants' responses.

4.5.6 Triangulation

Triangulation is the use of different research methods, multiple data sets, theories, and/or investigators to address a research question (Bhandari 2022; Turner, Cardinal & Burton 2017; Creswell 2022). Triangulation enhances the validity and credibility of the findings and can also mitigate bias in research (Creswell 2022). There are different types of triangulation in research, such as: data triangulation, which is the use of data from different time periods, spaces, and people; investigator triangulation, which involves multiple researchers in collecting and analysing data; theory triangulation, which is the use of varying theoretical perspectives in research; and lastly, methodological triangulation which is use of different methodologies to approach the same question. In this study, methodological triangulation was used, involving a convergent

parallel mixed-methods design. Multiple research methods (qualitative and quantitative) were used to study the same phenomenon. Bans-Akutey and Tiimub (2021), in their study on triangulation in research, indicate that triangulation provides a more comprehensive, valid, and reliable understanding of the phenomenon under study. Combining different methods in this study, which were qualitative and quantitative approaches, and a scoping review, complemented each other and aided in offsetting the limitations of any single method. Triangulation reduces bias, confirms findings, and shows that the approaches' findings converge, providing deeper insights into the issues than if a single method were used.

Below is a schematic summary of the triangulated methods.

4.5.6.1 Schematic summary of the triangulated methods

Convergent parallel mixed method framework: Phases of the study

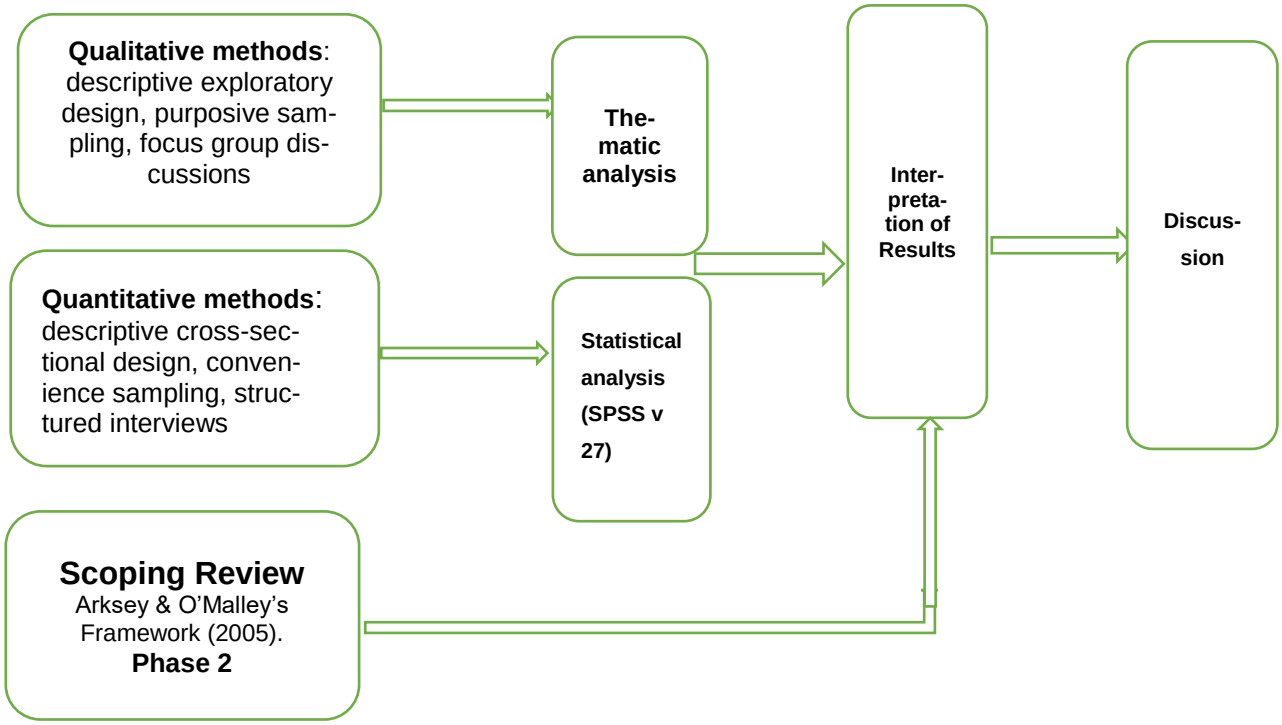


Figure 4.3: Convergent parallel mixed method framework

Triangulation contributes to the credibility and trustworthiness of findings, while complementarity enhances their interpretive depth. Combined, these approaches enable a multidimensional analysis that captures both the extent and the underlying causes

of a phenomenon. This is particularly valuable in health systems research, where understanding both outcomes and experiences is essential for effective intervention design.

In applied research contexts, such as cancer service delivery, the combined use of triangulation and complementarity supports evidence-based decision-making. Triangulation ensures that findings are robust and reliable, while complementarity ensures that they are contextually meaningful and grounded in real-world experiences. Together, these principles enable the development of interventions that are both empirically sound and responsive to the needs of stakeholders.

4.5.7 Merging the results of the qualitative and quantitative approach strands

Both qualitative and quantitative phases are presented as an integrated view after merging. The integration focuses on the variability in the issues faced in providing cancer care services and in the quality of life of cancer patients as beneficiaries of services provided. These combined results emphasise the necessity for multiple interventions, including staff development training, more effective patient education, and the creation of the outlined, structured programs to strengthen cancer care delivery in Botswana’s primary healthcare clinics.

In this study, quantitative and qualitative components are given equal priority because both are essential for providing a comprehensive understanding of cancer service delivery in primary healthcare settings. The complexity of health systems research requires both numerical evidence and experiential insights to fully capture the phenomenon under investigation.

From a methodological perspective, the study adopts a mixed-methods design in which quantitative data (e.g., service availability, screening rates, referral efficiency) and qualitative data (e.g., patient and provider/nurses' experiences) address the same research questions concurrently. Equal weighting is therefore justified because neither strand alone is sufficient to explain the problem; instead, they provide complementary forms of evidence that must be integrated to produce meaningful conclusions.

From a pragmatist perspective, equal weighting aligns with the principle that research methods should be selected and applied based on their usefulness in addressing real-

world problems. Pragmatism does not privilege one type of data over another but instead values the combined contribution of both in generating actionable knowledge. In this study, qualitative data explain the underlying causes and contextual factors, while quantitative data identify patterns and the magnitude of service delivery gaps; treating them equally ensures that both the 'what' and the 'why' of cancer service delivery are adequately addressed.

Furthermore, equal weighting enhances the validity and credibility of the findings through triangulation. By giving equal importance to both datasets, the study allows for convergence and corroboration of findings, thereby strengthening confidence in the results. It also reduces the risk of bias that could arise if one type of data were prioritised over the other.

Finally, the decision to weight both strands equally is driven by the study objectives, which explicitly require both measurement (e.g., assessing service gaps) and interpretation (e.g., understanding patient and nurses' experiences). As such, equal weighting ensures alignment between the study design, data collection, analysis, and overall research goals.

The results of the two phases are compared, merged, and interpreted as an outcome of a single study as presented below.

Table 4.9: Comparing, merging and interpreting findings from the study phases

Phase 1		Phase 2: Scoping Review
Qualitative results	**Quantitative results**	
Objective 1: Exploring the perceptions of nurses regarding cancer service delivery in primary healthcare clinics. n = 32	Objective 2: Assessment of cancer patients' quality of life, outcomes, and services on cancer care at primary healthcare clinics. n = 135	Objective 3: Identify programmes available to guide cancer service delivery in primary healthcare clinics n = 4
Theme 1: Lack of knowledge and skills in cancer management.	Regarding patients' satisfaction with health services provided at the local primary healthcare clinics, 73.3% reported being dissatisfied, 23% were neutral, and only 3% indicated satisfaction with services provided at the local clinic. The average patient rating of health care services is 3.34, which is below average. Most of the patients rated the health care services as poor, with scores ranging from 2.75 to 3.75 out of 10.	The review answers the following questions: • What literature is available on cancer service delivery programmes? • How are the cancer service delivery programmes being implemented? • What are the challenges of implementing cancer service delivery programmes in primary healthcare clinics? • How effective are the cancer care programmes? • How have the cancer care programmes been adopted and implemented in sub-Saharan Africa?
Theme 2: Delays in the diagnosis of cancer. Patient factors: • Delays in seeking medical services. • Associating cancer with traditional causes. • Associating a cancer diagnosis with death, leading to delays in coming for results.	The majority of the patients, 53% (n = 71), associate cancer with traditional causes like witchcraft and curses, and 40% were neutral, while 16.3% said it is caused by biomedical explanations only.	Literature indicates that cancer care in low- and middle-income countries is still at an infant stage, and resources are limited, such as human resources, equipment, and even the quality of treatment is low.

Health system factors: • Lack of equipment; specimens sent to a central laboratory. • Delayed turnaround time for results. • A long wait to be seen by an oncologist.		
Theme 4: Need for support for cancer patients.	85.9% reported a lack of support from nurses while at home; only 10.4% indicated receiving some form of support from nurses at the local clinic. 95.6% of patients reported not receiving any support from doctors at local clinics. The patients reported no support from the social workers at the local clinic; 94.1% reported this.	

4.6 CHAPTER SUMMARY

Chapter 4 presented the study's findings. The two research approaches were conducted in Phase 1 of the study, analysed separately, and the findings were interpreted and merged. Qualitative methods were used to explore nurses' perceptions of cancer service delivery in primary healthcare clinics; four themes and thirteen categories emerged. Quantitative methods were used to assess cancer patients' quality of life, outcomes, and services in cancer care at primary healthcare clinics. Findings converge, meaning both qualitative results and quantitative results point to the same conclusion and support each other. A scoping review was conducted to identify programmes available to guide cancer service delivery in primary healthcare clinics in Africa. The results were also merged at the end. The results of the scoping review also support the study findings, which are discussed in the discussion section, Chapter 5, that follows.

CHAPTER 5: DISCUSSION OF STUDY FINDINGS

5.1 INTRODUCTION

Chapter 4 presented the findings from the qualitative and quantitative methods of the study, guided by a convergent parallel mixed-methods design. This chapter discusses the study's findings in line with the literature review. This chapter presents an integrated interpretation of the study's findings, derived from both quantitative and qualitative strands, analysed concurrently within a convergent parallel mixed-methods framework, as indicated in Chapter 4.4.1.1. In this design, quantitative and qualitative data were collected and analysed independently but merged during interpretation to provide a comprehensive understanding of the research problem. The discussion focuses on areas where the two sets of results converge, complement, or diverge, highlighting how the integration strengthens the validity of conclusions. The discussion is organised around themes that emerged, and quantitative results are discussed within those themes.

5.2 LACK OF KNOWLEDGE AND SKILLS ON CANCER MANAGEMENT

The theme indicates a serious gap in cancer care delivery in primary healthcare clinics in Botswana and other LMICs. This finding reflects persistent systemic challenges in equipping frontline healthcare providers with adequate competencies to effectively prevent, detect, and manage cancer. Within the context of the Primary Health Care (PHC) philosophy, which emphasises equity, accessibility, prevention, and community-based care, such gaps undermine the delivery of comprehensive and person-centred services. Evidence from sub-Saharan Africa indicates that insufficient training among nurses remains a major barrier to effective cancer control (Ohene Oti et al., 2021).

According to the World Health Organization (2020), in a report on the Global Strategy on Human Resources for Health: Workforce 2030, non-oncology-trained nurses often lack adequate knowledge and practical skills to manage cancer patients effectively. The findings of this study align with global evidence indicating that cancer care in resource-limited settings is frequently compromised by workforce shortages and insufficient specialised training (WHO 2020). Furthermore, Kusi-Appiah, Donkor, Aziato et

al (2023) report significant deficits in chemotherapy administration knowledge and patient education among non-specialised nurses, which impact safety.

In line with the findings of Fadul, El Saghir, Ass et al. (2022), the knowledge gap increases the risk of medication errors and poor symptom management, compromising patient safety. Findings from cancer patients (quantitative strand) align with this theme. Cancer patients' dissatisfaction with service provision at primary healthcare clinics, which the majority rated as poor, confirms the lack of knowledge about cancer management. This confirms the hypothesis for the quantitative strand that there is a significant relationship between the quality of health care services provided in primary healthcare clinics and cancer patients' outcomes or quality of life. Furthermore, Kwame and Petrucka (2021:158) purport that such dissatisfaction indicates more profound problems with the quality of services.

The PHC philosophy advocates for a holistic, preventive, and promotive approach to healthcare, where nurses function as key agents in health education, screening, and continuity of care. However, when nurses lack essential oncology knowledge and clinical skills, opportunities for early detection and intervention are often missed. This contradicts PHC principles of appropriate technology and accessible care at the community level. Furthermore, disparities in service availability across Botswana, particularly between urban and district-level facilities, exacerbate the burden on PHC systems and highlight the need for strengthened capacity at the primary care level (Swart et al., 2024).

The International Society of Nurses in Cancer Care (ISNCC) (2021) calls for global action to implement standardised oncology nursing curricula and continuing education programs. Countries in LMICs, such as Botswana, are expected to embrace and implement this call to action. At the policy level, nursing councils and ministries of health should integrate oncology content into pre-service curricula and mandate periodic in-service training programs for non-oncology-trained nurses (ISNCC 2021).

The lack of knowledge and skills on cancer management among nurses in primary healthcare clinics is evidence that cancer prevention health information on lifestyle modification is not given to patients and communities when they seek services in these clinics. Cancer patients confirmed this. The integration of Patient-Reported Outcome

Measures (PROMs) into cancer care is increasingly recognised as a critical component of patient-centred care. PROMs capture patients' perspectives on their symptoms, functional status, and quality of life, thereby enhancing clinical decision-making and improving outcomes (Liang & Ye, 2023). Evidence from scoping reviews suggests that the use of PROMs in oncology can improve survival and health-related quality of life (Balitsky et al., 2024). However, effective implementation of PROMs requires healthcare providers to possess the necessary competencies to interpret and utilise such data. The lack of knowledge and skills among nurses therefore limits the meaningful integration of PROMs in PHC settings, undermining efforts to deliver person-centred care.

Furthermore, the lack of knowledge and skills negatively impacts nurses' confidence and attitudes towards cancer care. Nurses who feel underprepared may experience anxiety and reluctance to engage in cancer management, which can affect patient outcomes and the overall quality of care. Strengthening workforce capacity through in-service training, mentorship, and supportive supervision is essential to empower nurses and align practice with PHC principles of equity, quality, and community responsiveness. Addressing the knowledge and skills gap in cancer management among PHC nurses in Botswana is critical for improving cancer service delivery. Integrating oncology training into routine practice, strengthening PHC systems, and promoting the use of PROMs can enhance patient-centred care and outcomes. These efforts are essential to ensure that PHC clinics effectively contribute to cancer control and align with both national priorities and global health goals.

5.3 DELAYS IN CANCER DIAGNOSIS AND TIMELY INITIATION OF TREATMENT

The study found that delays in making a cancer diagnosis were attributed to a lack of knowledge and skills in cancer management on the part of nurses and other healthcare workers. Delays in cancer diagnosis and timely initiation of treatment remain a major challenge in low- and middle-income countries (LMICs), with profound implications for patient outcomes. Evidence indicates that such delays often result in patients presenting with advanced-stage disease, significantly reducing the likelihood of curative treatment, and contributing to high mortality rates (Allemani, Matsuda, Di Carlo et al. 2018; Kingham et al. 2015). Advanced disease not only worsens prognosis

but also increases treatment complexity and costs, which are often prohibitive in resource-limited settings (Fadul et al. 2022). Furthermore, delayed care exacerbates patient suffering through prolonged symptoms and diminished quality of life, while placing additional strain on already overburdened health systems (Ginsburg, Bray, Coleman, Vanderpuy, Eniu, Kotha, Sarker, Thanh Huong, Allemani, Dvaladze, Gralow et al. 2017). The World Health Organization (2020) underscores that early detection and timely treatment are critical to improving survival and reducing the global cancer burden. Therefore, addressing systemic barriers such as limited diagnostic infrastructure, workforce shortages, and financial constraints is essential to mitigate these delays and improve cancer outcomes in LMICs.

According to Ferlay et al. (2018), health system challenges impede the implementation of comprehensive cancer services, including prevention, screening, diagnosis, treatment, and palliation. Brand, Qu, Chao, and Ilbawi (2019:1371-1380) report that early cancer diagnosis and appropriate treatment have been shown to reduce cancer deaths. Timely diagnosis in cancer management is key because it ensures that the disease does not progress to advanced stages where prognosis is poor (Neal, Tharmanathan, France et al. 2015:112).

Patient factors were pointed out as a contributor to delays in the timely diagnosis of cancer. Some cancer patients indicated they believe cancer to be caused by non-medical factors such as traditional related factors. In this study, the majority of cancer patients indicated that they did not have cancer information. This gives a picture of what might be happening in communities in Botswana, thus leading to delayed diagnosis and poor outcomes, hence patients associating cancer with death. Nurses reported that patients may do tests to facilitate confirmation of cancer and then fail to come back for results, because of fear of death, and only to show up when in a critical condition. Schliemann, Donnelly, Dahlui et al. (2018:881) recommend that culturally appropriate multimedia campaigns must counteract prevailing cancer myths while providing clear, actionable prevention and early detection information. Delays in diagnosis lead to late initiation of treatment, which significantly lowers survival rates compared to early-stage interventions. In Botswana, the burden of cancer is increasing, with significant challenges related to late diagnosis and limited access to specialised oncology services. It is reported that a large proportion of patients are diagnosed at

advanced stages, contributing to poor outcomes and high mortality rates (Rutgers Global Health Institute, 2022). Delays in diagnosis are further compounded by limited knowledge among primary care providers, as studies have shown prolonged timelines between first presentation and referral to specialised cancer care, often exceeding several months (Tapela et al., 2018). These findings highlight the crucial role of PHC nurses in early detection and timely referral, and the consequences of inadequate training in this context.

5.4 NEED FOR SUPPORT FOR CANCER PATIENTS

The absence of cancer support structures in the community was raised as a serious gap in the cancer care pathway by nurses. Joko-Fru, Bardot, Bukirwa et al. (2024:356-365) report that cancer survival continues to vary widely across populations, with lower survival rates in sub-Saharan Africa than in other regions. Community-based support, such as cancer support groups, is very important for cancer survivorship. The existence of community support groups, where they exist, buffers the impact of challenges brought about by cancer on families and patients.

In developed countries, there are online and live support groups which are led by professional oncology social workers who offer support and guidance, known as Cancer Care support groups, which offer the opportunity to connect with others who share similar concerns and experiences, and the support is available 24 hours a day, 7 days a week (D'Oria, Puzo, Nowrouzi et al. 2026).

In this study, nurses reported that even if they budget for community outreach services and health campaigns to create community awareness on non-communicable diseases, including cancer, it is never approved. Political commitment drives resource allocation and fosters an environment conducive to policy implementation and sustained improvements (Bamodu et al. 2024:167-168). This lack of resources in low- and middle-income countries translates into stark differences in cancer outcomes and survival rates, reflecting health inequities and a profound social justice concern compared to High-income countries (Atun, Jaffar, Nishtar et al. 2015:1153-1186).

The primary health care clinics do not provide counselling services, indicating a lack of psychological care for cancer patients, as indicated by nurses. This is a serious gap in the cancer care pathway. Bamodu et al. (2024:167-168) report that addressing the

psychological and societal dimensions of cancer is critical for reducing stigma and combating treatment abandonment or noncompliance. Furthermore, expanding psychosocial support services, encompassing counselling, support groups, and community engagement, fosters understanding, empathy, stigma reduction, care-seeking, treatment adherence, and patient engagement in their cancer care journey, fostering resilience and enhancing cancer survivorship.

Bamodu et al. (2024:167-168) purport that developing strong primary care delivery platforms integrated with specialised oncology care, alongside flexible and resilient health system models tailored to local contexts, is critical to curb the rising tide of cancer in resource-limited settings. In a scoping review exploring cancer survivorship in Africa, Onyeka et al. (2025:102-106) indicate that the World Health Organization (WHO) recognises the community health workforce as a crucial asset in improving access to cancer care and that this improves cancer patients' outcomes and promotes survivorship.

The study found the general lack of emotional support for cancer patients and their caregivers, consistent with these results. Studies by Lorhan, Dennis, Vander et al.(2014:237-248) and Nguyen, Tran, Kagawa-Singer et al.(2011:83-97) report that emotional distress associated with a cancer diagnosis was a significant stressor for which participants needed emotional support. Bamodu et al. (2024:167-168) purport that psychosocial support services have emerged as the cornerstone of comprehensive cancer care. Cancer imposes not only physical burden but also profound emotional, social, and financial stressors, making psychosocial, informational, and practical support essential for improving patient outcomes. The two strands of the study converge and show that all forms of support for cancer patients are lacking.

5.5 A PROGRAMME TO GUIDE CANCER CARE

The lack of trained oncology nurses and other healthcare workers across all three study sites is evidence of a serious gap in the cancer care pathway. They further indicated that services guided by programmes or protocols tend to have excellent uptake by communities and, hence, better patient outcomes, because health services are standardised and programmes tend to guide and upskill health workers. Bamodu et al. (2024:167-168) emphasise that these health system gaps should be strategically

addressed through decentralised, cost-effective, context-specific interventions, such as programmes or guidelines, and that this can progressively abate pervasive inequities in the global cancer burden. They also note that LMIC health systems must undergo major transformations to achieve universal health coverage.

As confirmation to what nurses asserted, cancer patients' overall rating of health care services provided by primary health care clinics was poor, this was done on a scale of one to ten, where 1 = Extremely poor, 5 = Moderate/average, 10 = Excellent, the actual rating was between 2.75 and 3.75; indicating poor services, and this was indicated by 90% (n = 122) out of 135 patients. This presents a serious challenge in the care of cancer patients. This is a situation that cannot be ignored; hence the need for a cancer management programme to address it.

Lack of healthcare system barriers like: lack of providers' competencies on cancer screening procedures, lack of knowledge of policies on breast and cervical cancer prevention, early detection and management and health care workers relying solely on patients to present at primary care clinics with self-reporting breast cancer symptoms or risks (Tshabalala, Blanchard, Mmoledi, Malope, O'Neil, Norris, Joffe & Dietrich 2023). In Botswana, there is a dearth of literature on available programmes that could guide cancer service delivery; hence the need to develop a programme.

Furthermore, the need for a structured programme to guide cancer care in primary healthcare (PHC) clinics staffed by non-oncology-trained nurses is critical in low- and middle-income countries (LMICs). These nurses often serve as the first point of contact for patients, yet lack specialised knowledge and skills to manage cancer effectively. Evidence shows that without clear protocols and training frameworks, cancer patients face delayed diagnosis, inadequate symptom management, and compromised safety (Fadul et al. 2022; Kusi-Appiah et al. 2023). A well-designed programme would standardise care processes, provide clinical guidelines for early detection, referral pathways, and symptom control, and integrate psychosocial support strategies.

The World Health Organization (2020) emphasises that strengthening PHC systems through capacity-building initiatives is essential to reduce cancer-related morbidity and mortality. Ferrell and Coyle (2018) further advocate for oncology education embedded

within PHC settings to empower nurses and improve patient outcomes. Such programmes should also include continuing professional development, mentorship, and access to decision-support tools to ensure sustainability and quality of care. Implementing these interventions can bridge the gap between limited specialist availability and the growing cancer burden in LMICs, ultimately enhancing equity and accessibility in cancer services.

5.6 CHAPTER SUMMARY

The chapter discussed the findings of the quantitative and qualitative approaches, including literature supporting them. The two strands of this study point to the same conclusion: that non-oncology-trained nurses face enormous challenges in delivering safe and effective cancer care due to inadequate knowledge and skills. This convergence strengthens the validity of the findings and underscores the urgency for targeted interventions. Chapter 6 will present the scoping review to map and identify gaps in studies on cancer care within primary health services in the SADC and Africa.

CHAPTER 6:

SCOPING REVIEW OF STUDIES ON PROGRAMS THAT GUIDE CANCER SERVICE DELIVERY

6.1 INTRODUCTION

A scoping review provides a systematic approach to mapping existing evidence on this topic, identifying key concepts, gaps, and research priorities. Unlike systematic reviews, which focus on synthesising findings to answer a specific question, scoping reviews aim to explore the breadth of literature and clarify areas requiring further investigation (Munn, Pollock, Khalil et al. 2022:950-952). This chapter presents the rationale, objectives, and methodology of the scoping review conducted to examine the knowledge, skills, and support needs of non-oncology trained nurses in LMICs, as well as strategies proposed to strengthen cancer care delivery in primary healthcare settings.

Scoping reviews can clarify key concepts or definitions in the literature and can also identify key characteristics or factors related to a concept, including those related to methodological research. Scoping reviews have evolved since the inception of the Arksey and O'Malley Framework in 2005 (Westphaln, Regoeczi, Masotya et al. 2021)

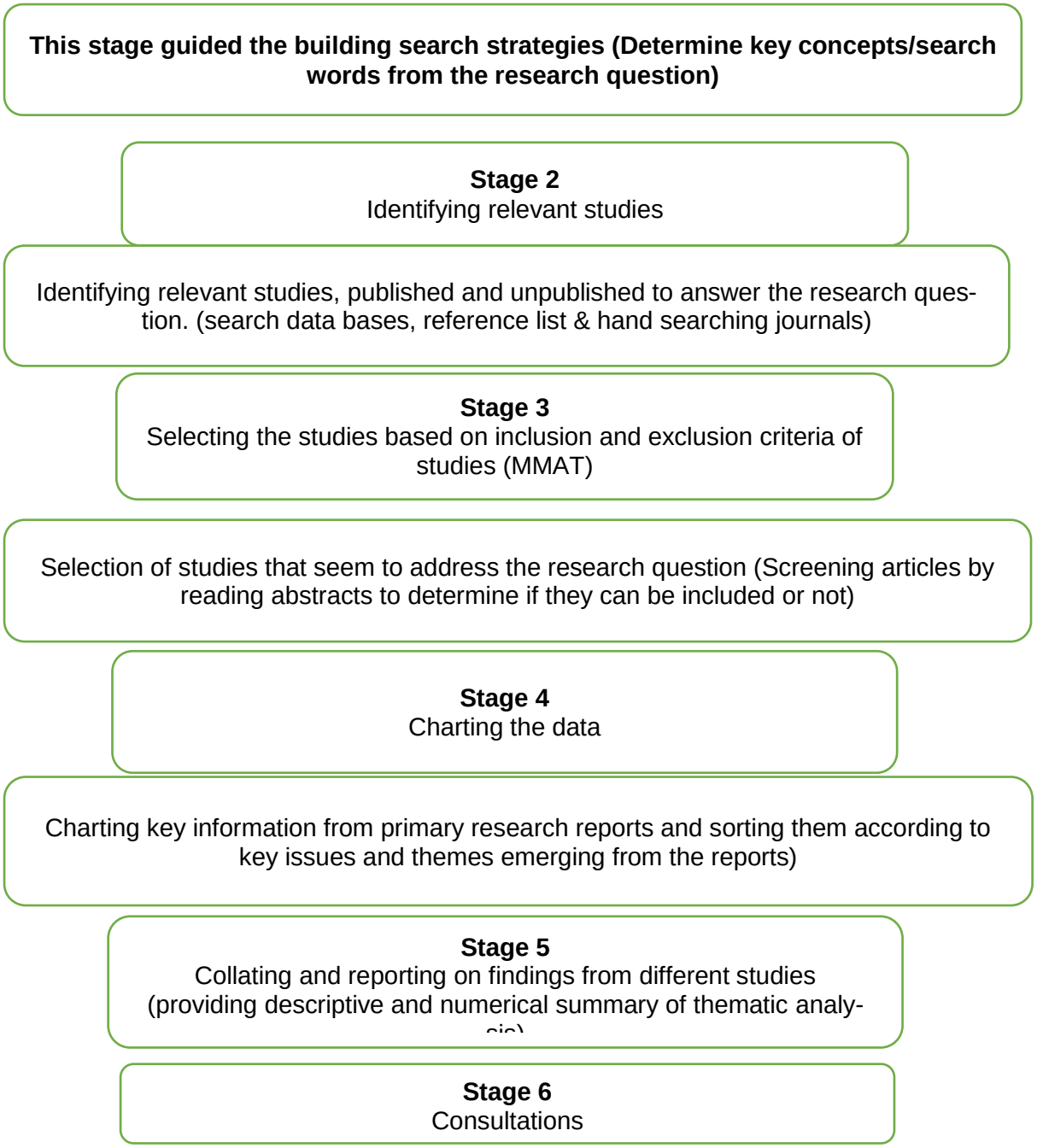
This scoping review is part of a bigger study, and Arksey and O'Malley's framework scoping review was followed. Furthermore, scoping reviews can be conducted to map the existence of literature in the specific field in terms of their nature, features and volume, and this suggests that scoping reviews can be done as a stand-alone project where a complex area has not been comprehensively reviewed (Daudt et al. 2013; Arksey & O' Malley 2005).

The scoping review was conducted as part of this study, consisting of three phases. The study aimed to map and develop a program to guide cancer service delivery by non-oncology registered nurses in primary healthcare clinics. The aim of the scoping review was to map programs for cancer service delivery in primary healthcare clinics. Further, it identified different methods utilised in studies conducted. Arksey and O'Malley's (2005) methodology guided the review.

6.2 SCHEMATIC PRESENTATION OF ARKSEY & O'MALLEY'S FRAMEWORK

Below is a Schematic Presentation of Arksey & O'Malley's Framework (2005)

Articles selected were scrutinised to find the best available evidence to support the study aim.



This is an optional step which involves consultation with stakeholders to inform and validate the findings of the scoping. Further developing networks/collaborations & lessons learnt and information sharing

Figure 6.1: Schematic presentation of Arksey & O'Malley's Framework (2005)

The Mixed Methods Appraisal Tool (MMAT) version 2018, Hong, Pluye, Fàbregues et al. (2018), was used to appraise studies that were relevant after selecting from those that were identified from the databases. The MMAT was developed based on critical reviews of different appraisal tools and the involvement of opinions of MMAT users, as well as utilising e-Delphi with international experts. Mixed Methods Appraisal Tool version 2018 recommended appraisal of empirical studies using different methodologies other than appraising the diagnostic accuracy of studies. It also recommended that at least two experts should be involved in the appraisal process using MMAT. In the case of this scoping review, the experts consisted of the researcher and a WB who is a mentor to the researcher, based in Botswana, who ensured the rigour of the scoping review.

6.3 THE QUESTION

The question for the scoping review is aligned with the aims, as it guides search terms and data extraction (Munn, Pollock, Khalil, Alexander 2022:950-952).

The question for this scoping review is: What programmes are available to guide cancer care in Primary Care settings?

6.4 OBJECTIVES OF THE SCOPING REVIEW

The objectives of this scoping review were:

- To identify and map out studies that developed programmes to guide cancer service delivery irrespective of the contexts in which they were developed.
- To determine the scope and focus of programmes developed to guide cancer service delivery.
- To map different methods used in the studies identified and report on the evidence.

6.5 METHODS

The scoping review followed guidelines suggested by Arksey & O'Malley (2005) (Figure 5.2). This method uses a narrative or synthesis approach to contrast and appraise different studies or methodologies to explore a specific issue or concern. For this study, the aim was to map studies addressing programmes to guide cancer management, delineate the different methods used in these studies, and determine the breadth of studies relating to the topic of interest.

The researcher sought guidance from the librarian on how best to identify databases and determine keywords (search terms) for the scoping, based on the research question and the objective of the scoping review. The databases consulted were CINAHL Plus with full text, Academic Search Ultimate, Africa Wide Information, Global Health, Health Source, Nursing Academic, MEDLINE, PubMed, Sabinet, Social Science Index, and Scopus. The scoping review conducted for the study was not restricted to a particular context. The researcher purposefully included other contexts that could inform the development of the programme on cancer service delivery to achieve wider coverage of similar programmes and to delineate the need for such a programme (especially within a sub-Saharan context).

6.5.1 The search

The search terms used were cancer service delivery programme, AND primary healthcare clinics, AND cancer support programmes, AND cancer survivorship programme, AND cancer management programmes. Further refinement aimed at scholarly peer-reviewed articles. At the initial stage, the researcher, in consultation with the study supervisor, demarcated the articles to be searched for between 2019 and 2024. Articles accessed included programmes addressing cancer care and service delivery in general, whilst others addressed programmes to guide cancer care in primary health care settings. Other articles consulted were from the reference lists of articles retrieved during the scoping review.

Whilst the researcher noted that available programmes were mostly piecemeal, addressing only a specific issue, comprehensive programmes addressing the topic were

limited and mostly were guiding the development of cancer national control programmes and the challenges they faced (Ayandipo et al. 2020; Duncan, Cira, Barango & Trimble 2019). These were mainly for the African context.

6.5.2 Inclusion criteria

Articles written in English which addressed cancer service delivery programmes or programme guidelines, or cancer survivorship programmes. All peer-reviewed papers published from 2019 to 2024 that broadly addressed the study's objectives. Reports, summits, or conference reports on well-elaborated cancer service delivery frameworks/guidelines or visions. The participants should have a confirmed cancer diagnosis but not be too frail or too distressed, and be undergoing treatment or having completed treatment for any type of cancer.

6.5.3 Exclusion criteria

All peer-reviewed studies published before 2019. All studies with cancer programmes that do not address service delivery programmes or approaches. All studies not published in English, randomised clinical trial studies, studies still in progress stages, literature or systematic review studies, or policy-related studies.

6.6 RESULTS OF THE SEARCH

A total of 40 articles were retrieved from databases (Figure 5.2). A further refinement included only scholarly, peer-reviewed articles (n = 36) and the removal of duplicate articles (n = 10), yielding 26 articles that met the inclusion criteria.

The researcher conducted further screening of the remaining articles by reviewing their abstracts to determine whether they met the inclusion criteria. After reviewing the abstracts, only 6 (9) articles met the inclusion criteria and were fully read. The researcher read the full texts of all articles to determine whether they were relevant to answering the research question for the scoping review. Three (n = 5) articles were excluded because they focused on oncology nursing education programs. After all remaining articles were fully read, six (n = 6) were selected for scoping.

The search process is presented in Figure 6.2, the PRISMA flow diagram of the search conducted (Hong et al. 2018).

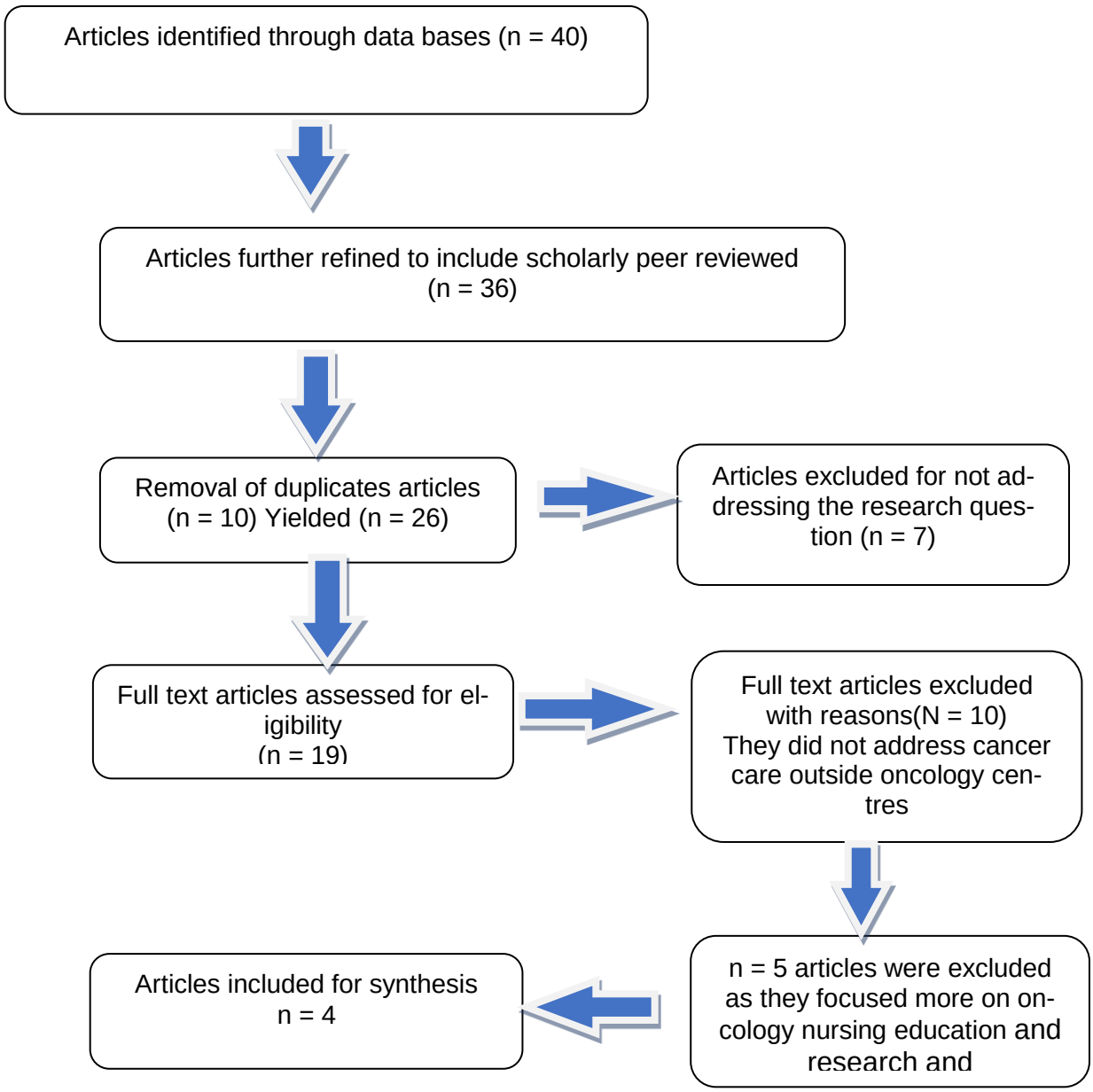


Figure 6.2: PRISMA flow diagram of articles reviewed

To appraise the studies included for scoping, a data extraction sheet was developed. The data extraction sheet consisted of the author and date of publication, purpose of the study, design and data collection methods, country of origin, population and sampling, and the programme facilitator. Hong et al.'s (2018) Mixed Methods Appraisal Tool (MMAT) 2018 version was utilised to appraise the quality of selected articles. To ensure that articles meet inclusion criteria, it was important to clarify two questions as guided by the tool. The questions highlighted whether a clear research question was available from the selected studies: Were the data collected addressing the research

question determined? Records identified through databases (n = 40). Records were further refined to include scholarly, peer-reviewed (n = 36). Removal of duplicates(n = 10) yielded (n = 26)). Seven (n = 7) were removed for not addressing the research question. Records excluded after reading abstracts (n = 10). Articles included for synthesis (n = 9), (n = 5). Articles were excluded as they focused on oncology nursing education and research. Hong et al. (2018) believe that if the answer is no or cannot be determined to either of the screening questions, no further appraisal is possible.

Table 6.1 presents the characteristics of the articles included in the scoping review.

6.7 RESULTS

Table 6.1: Characteristics of the studies included for the scoping

Author and year of publication	Purpose of the study	Designs and data collection methods	Country of origin	Population and Sample	Programme facilitation
Ayandipo et al. (2020)	To assess the capacity and needs of health systems to prevent and control cancer	A cross-sectional study, mixed methods. A standardised questionnaire designed using the WHO framework for the health system, and an interview guide for in-depth interviews, were complemented by direct observations and document review.	Three West African countries; (Ghana, Nigeria & Senegal)	Institutions were sampled at different levels (primary, secondary, and tertiary). A total of 372 healthcare workers were assessed in Nigeria, 122 in Ghana, and 42 in Senegal.	Nigeria´s Federal Ministry of Health (FMoH) implements cancer policy through the National Cancer Control Programme (NCCP), which is more akin to a cancer department and lacks sufficient funding and capability to control cancer in Nigeria comprehensively. Most units are inactive and do not provide overall leadership for the prevention and control of cancer. In Ghana, there is a National Cancer Control Programme. The

					National Guideline for Cancer management was developed and started operating in February 2017. The Guideline focuses on the major cancers in Ghana, namely: Breast, Cervical, Prostate, Non-Hodgkin Lymphoma and Childhood Cancers. describes the screening and early detection techniques, the diagnostic techniques, including the staging and the various treatment modalities (chemotherapy, radiotherapy, and surgery) for the various cancers. Senegal has already put in place an NCDs programme with only five (5) employees, none of whom are assigned exclusively to the prevention and control of cancer. However, the country has developed two main documents geared towards the management of NCDs and cancer. These are The Integrated Plan for the Fight against

					Non-Communicable Diseases (2017-2019) and The Strategic Plan for the Fight against Cancer (2015-2019). Unfortunately, these documents are not fully implemented yet, due to a lack of funds. Besides, there is no national cancer steering committee to guide, coordinate and monitor the various interventions in Senegal. There are no evidence-based national guidelines /protocols/standards for the management of cancer through a primary care approach.
Jatho, Basu & Okwor (2020)	To reduce the unmet needs of cancer prevention and early detection services in Uganda through capacity building	Descriptive Qualitative design. Data collected through in-depth interviews	Uganda	Primary healthcare workers in 122 districts. 4 were purposively sampled, and 118 districts were ultimately included.	Interventions involved stakeholders' consultative meetings, development, and distribution of cancer reference IEC materials for health workers and communities, training of district PHC workers and follow-up. These materials were developed to provide reference information for the health

					workers and community village health teams (VHTs) with priority on the most common types of cancer in Uganda, especially cervical, breast, and prostate cancer.
Duncan, Cira, Barango &Trimble (2019)	i. To Mobilise resources and partners for planning and implementation of cancer care models/ programs and strategies. ii. To have accurate surveillance data to promote better resourcing of National Cancer Control Programmes (NCCPs); and iii. To develop sustainable and innovative partnership models to strengthen the capacity to implement NCCPs.	Surveys conducted via Google Forms.	Sub-Saharan Africa, starting in Uganda, then covering all countries in sub-Saharan Africa by US National Cancer Institute	Centre for Global Health administered baseline surveys to participants of the 2017 International Cancer Control Leadership Forum (ICCLF) program, and participants of the Extension for Community Health Outcomes (ECHO) programme and the response rate was 73% for ICCF and 77% for ECHO.	i. Mobilisation of resources and partners for plan implementation. Cancer-control planners are faced with implementing cancer-control policy with suboptimal budget allocation needed to secure the necessary human, technical, educational and infrastructure resources. A standalone cancer-control programme, or one divided across MoH units (with prevention and clinical management of cancer handled by different units/departments within the MoH structure). ii. Accurate surveillance data to promote better resourcing of NCCPs. Robust and sustainable population-based cancer registries are

					crucial for measuring the burden of cancer in a community, assessing the impact of interventions, and conducting critical etiological research. iii. Sustainable and innovative partnership models to strengthen capacity to implement NCCPs. Human resource shortages and a lack of basic medical support staff contribute to generally poor outcomes in cancer control. Better coordination of care and more resources and skilled professionals at primary and secondary health facilities would lessen the burden on tertiary health centres and help ensure more equitable implementation of NCCPs
Tshabalala et al. (2023)	Explored contextual enablers and barriers for early detection of breast and cervical cancers according to facility managers and clinical staff at	Qualitative exploratory, in-depth interviews (IDIs) on screening and early detection of breast and cervical cancer	Eight primary healthcare clinics, four each in Soweto and Orange Farm. South Africa	A total of 22 one-on-one IDIs (13 with healthcare providers and 9 with facility managers) were conducted	i. Healthcare provider and manager barriers Lack of knowledge of policies on breast and cervical cancer prevention, early detection, and management

	primary healthcare clinics	with primary care facility nurses, doctors, and managers			Inadequate healthcare provider competency for the cancer screening procedure Relying solely on patients to present at primary care clinics with self-reporting breast cancer symptoms or risks Shortages in screening facilities, supplies, and human resources.

6.8 FOCUS AND CONTENT OF THE STUDIES REVIEWED

A further analysis of the studies' content and focus was conducted. This is presented in Table 6.7.

Table 6.2: Focus and content of the studies reviewed

Programme Focus	n = 4
National cancer programmes	3
Capacity building programme	1

All four (n = 4) studies focused on programmes that facilitate cancer care from the national level to primary healthcare clinics. One aimed at capacity-building for health care workers at primary healthcare clinics (Tshabalala et al. 2023). Three were on National cancer programming and strategies (Ayandipo, Wone, Kenu, Fasehun, Ayandipo, Gaye, Ojo, Ayoola, Omogi, Lakew & Thiam 2020; Duncan, Cira, Barango & Trimble 2019). Table 5.3 presents the types of professionals involved in the programmes.

6.9 TABLE OF THE TYPE OF PROFESSIONALS LEADING THE STUDIES

Table 6.3: Types of professionals leading the study

Type of professional	n = 4
Nurse-led	1
Other health staff (oncologist, public health officer & psychologist)	3

6.9.1 Scoping Review discussion

The findings of this scoping review highlight a pronounced paucity of literature on structured programmes guiding cancer service delivery within primary healthcare (PHC) clinics across Africa. This gap is notable given the rising burden of cancer across the continent and the central role of PHC systems in delivering equitable, accessible care (World Health Organization, 2020).

Africa is undergoing an epidemiological transition, with non-communicable diseases (NCDs), including cancer, increasingly contributing to morbidity and mortality. However, health systems have historically prioritised infectious diseases such as HIV/AIDS, tuberculosis, and malaria, resulting in inadequate integration of cancer services within PHC (Bray et al., 2018; Sylla and Wild, 2012). The scarcity of literature on PHC-based cancer service delivery programmes reflects the dominance of vertical programming approaches. Donor-funded health initiatives often focus on disease-specific priorities, limiting the development of integrated programmes that guide holistic cancer care within PHC frameworks (Atun et al., 2015).

The lack of well-documented programmes has significant implications for health system strengthening. Without structured guidance, PHC facilities are less capable of providing consistent cancer care services, resulting in delayed diagnosis and poor outcomes (Gelband et al., 2015). Future research should focus on implementation science and integration models that leverage existing PHC platforms. Strengthening data systems and improving documentation practices will be critical in building a robust evidence base to inform policy and practice (Atun et al., 2015; WHO, 2020). Botswana's National Cancer Control Plan (2016–2026) outlines strategies for prevention, screening, and treatment, but implementation at PHC level remains limited (Ministry of Health Botswana, 2016).

6.10 CHAPTER SUMMARY

This chapter presented a scoping review of studies on programmes that guide nurses and possibly other healthcare professionals in cancer care in primary healthcare clinics. Arksey and O'Malley's (2005) framework guided the scoping of the studies. The question for the scoping was "What programmes are available to guide cancer care in Primary Care settings? Hong et al.'s (2018) Mixed Methods Appraisal Tool (MMAT) was utilised to appraise the relevance of the programmes to the research question and data collection methods. Four studies met the inclusion criteria for the scoping; one was nurse-led, and the other three were led by healthcare professionals. However, in the study led by nurses, other health professionals were included in a consultative role. Programmes for cancer service delivery in primary healthcare settings are

limited, emphasising the need for the development of a programme to guide cancer service delivery in primary healthcare settings.

CHAPTER 7: PROGRAMME DEVELOPMENT AND VALIDATION

7.1 INTRODUCTION

The previous chapter presented a scoping review of studies conducted on programmes developed to guide cancer management. The scoping review identified a lack of similar programmes in an African context. This indicated a need to develop a programme to guide non-oncology-trained nurses in the care of cancer patients in primary health clinics. In Phase 1 of the study, under the qualitative strand, nurses highlighted a lack of knowledge and skills in oncology and pointed to a need for a programme to guide and standardise the care of cancer patients in clinics. There was convergence with the quantitative strand's results, in which cancer patients also reported poor-quality services and a lack of support from their local clinics.

This chapter discusses the third objective of the study, which is Phase 3: Development and validation of a programme to guide cancer service delivery by nurses in primary healthcare clinics. A programme refers to a structured set of planned activities, interventions, and resources designed to achieve specific goals or outcomes over a defined period of time (Potter et al., 2021; WHO, 2016). In healthcare, programmes are implemented to improve health outcomes, strengthen systems, and build capacity among healthcare providers.

To develop the programme, a conceptual framework is required to facilitate its development. Walker and Avant describe a conceptual framework as a systematic way of organising and defining concepts and the relationships between them, primarily achieved through concept analysis (Walker and Avant, 2019). This process involves identifying attributes, antecedents, and consequences of concepts, promoting clarity and consistency in research and programme development. Furthermore, Chinn and Kramer define a conceptual framework as a logical structure of interrelated concepts, assumptions, and propositions that provide a systematic view of a phenomenon (Chinn and Kramer, 2018). The framework emphasises relationships among concepts and their application in nursing practice, facilitating the integration of theory into practice (McEwen and Wills, 2019).

Dickoff et al.'s (1968:434) survey list was used as a thinking map and served as the basis for formulating a conceptual framework, which eventually guided the development of a programme. Non-oncology-trained registered nurses in clinics reported a lack of knowledge and skills in cancer management. In this study, patient-reported outcomes/patient quality of life were assessed, and the health care services provided to cancer patients by nurses in local clinics were explored to provide feedback on whether the care is appropriate and comprehensive. The patient outcomes of interest align with the six concepts depicted in the Patient-Reported Outcome theoretical framework (Chapter 2; Fig. 1).

These concepts guided the development of a questionnaire for cancer patients and enabled their responses to be recorded without clinician interpretation. These included cancer services, assessment of cognitive and emotional aspects of a patient, lifestyle factors, and social and material context. Characteristics of cancer treatment included side effects (whether mild or serious), health experience and state, and their general impression of health care services, including follow-up care at home. The nurses' perceptions of the services they provided to cancer patients were explored, as were how they were perceived and whether they promoted positive patient outcomes. Based on the findings and the scoping review, it has become apparent that a programme for cancer service delivery is required.

7.1.1 Justification for Dickoff Framework

Dickoff et al.'s practice-oriented framework was selected over other theoretical models due to its strong applicability to programme development and its contextual relevance to primary healthcare (PHC) settings. One of its key strengths lies in its structured yet flexible approach, which clearly delineates essential elements of an activity; namely the agent, recipient, context, procedure, dynamics, and terminus, thereby facilitating systematic planning, implementation, and evaluation of health programmes. This makes it particularly advantageous for developing practical, context-responsive interventions aimed at improving healthcare delivery. Furthermore, the framework is inherently action-oriented and focuses on translating theory into practice, which aligns well with the goal of strengthening cancer service delivery within PHC. In the Botswana

context, where PHC clinics serve as the first point of contact and where resource constraints and workforce capacity challenges persist, Dickoff et al.'s framework offers a pragmatic structure for designing interventions that are both feasible and sustainable. Its emphasis on clearly defining roles, processes, and expected outcomes supports the development of targeted capacity-building initiatives, such as oncology training programmes for nurses, while remaining adaptable to local health system realities. Consequently, the framework is particularly suitable for addressing gaps in knowledge and skills in cancer management within Botswana's PHC oncology landscape.

7.1.2 Importance of Conceptual Framework in Programme Development

A conceptual framework is essential in programme development because it provides structure and direction to the study. It clarifies key concepts, guides programme design, and ensures alignment between interventions and expected outcomes (Chinn and Kramer, 2018; Polit and Beck, 2021). Furthermore, it supports evidence-based practice and assists in evaluating programme effectiveness by ensuring coherence between the problem statement, objectives, methodology, and anticipated outcomes (Walker and Avant, 2019; Green and Glasgow, 2006).

7.2 RESEARCHER'S THINKING MAP: IDENTIFICATION OF THE CENTRAL CONCEPTS

The researcher's thinking map presents the structure of the concepts derived from Phase 1, as well as the interaction between the agent (nurses) and the recipient (cancer patients). This also includes the context, dynamics, and procedures of the activity, as well as the outcomes linked to the concepts derived from the findings of the Phase 1 and Phase 2 Scoping reviews. The interaction between the agent (nurses) and the recipient (cancer patients) was contextualised into a framework. This outlined the procedures, the roles, and activities to be performed to attain the desired outcomes.

The context determines the procedure to be followed, while also taking into account the dynamics of the interaction and the facilitation required to achieve the desired outcome. Therefore, this thinking map serves as the basis for the formulation of a conceptual framework that guided the development of the programme. To develop a conceptual framework, Dickoff et al. (1968:434) used a survey list as a thinking map. The survey list includes the following questions: Who is the healthcare provider? Who are

the recipients of healthcare? What are the procedures followed to provide healthcare? What is the context in which healthcare is provided? What are the dynamics within the healthcare environment? And lastly, what is the outcome of healthcare services?

Dickoff's survey list is presented and applied below:

- Agent(s) are the nurses in primary health care clinics who provide services to cancer patients.
- Recipients are cancer patients receiving healthcare services in primary healthcare clinics.
- Procedures are strategies put in place to facilitate nurses' provision of quality care to cancer patients in clinics.
- Context is the environment in primary healthcare clinics where registered nurses provide healthcare services to patients.
- Dynamics are interventions employed to capacitate nurses in primary healthcare clinics on patient management, involvement of qualified oncology nurses, multidisciplinary team, mobilisation of resources, policies and standards in cancer management, empowerment of other stakeholders such as traditional healers, herbalists, and spiritual healers.
- Outcome is the endpoint of quality care for cancer patients, and it is critical to recovery and survivorship.

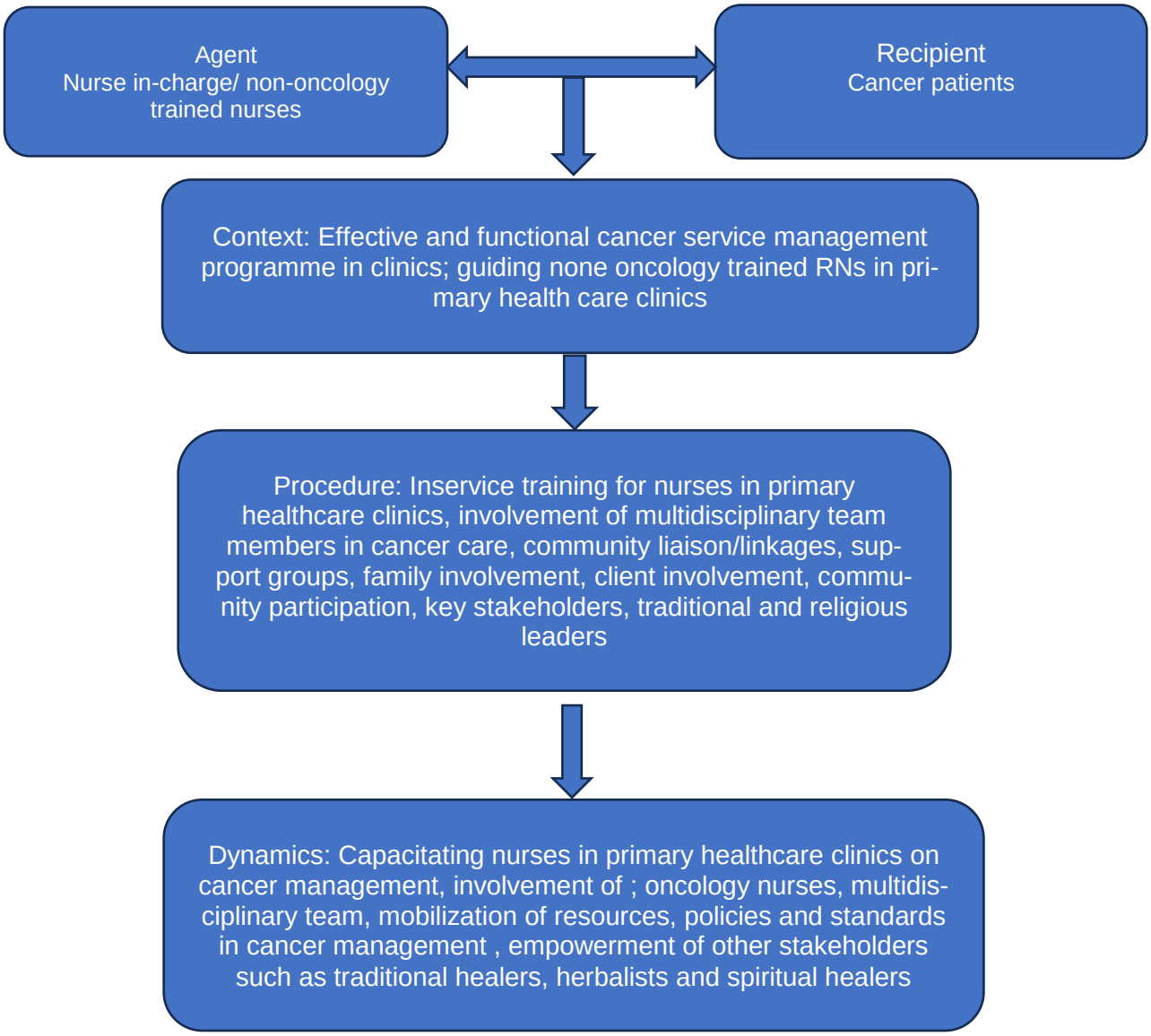
The survey list, as proposed by Dickoff et al. (1968:422-425), facilitated the identification and categorisation of major concepts for further refinement, thus ensuring the logical development of a cancer service delivery programme.

The major concepts and related concepts were clarified through the researcher's thinking map. Reasoning is the ability of the mind to understand things logically or the process of thinking about things logically (Merriam-Webster Dictionary, n.d; Oxford Dictionary, n.d). Furthermore, one key benefit of mind mapping is its ability to enhance thematic cohesion and narrative flow (Fearnley 2022). The thinking map is, therefore, a suitable tool for capturing and clarifying interacting concepts. The thinking map served as the basis for a conceptual framework for a cancer service delivery program for nurses in primary health care clinics, to facilitate cancer care at primary health care

clinics and in home care. The researcher's thinking map indicates who the key players in the program are (nurses in primary healthcare clinics) and the recipients (cancer patients). The dynamics of the interaction are indicated. The procedure to be followed was determined to attain the required outcomes.

The assumption that guided this study is that a person is a whole being that interacts with internal and external environments, and that health is an interactive dynamic process that requires mobilising resources and upskilling human and material resources.

Below is a schematic presentation of the conceptual framework that guided program development.



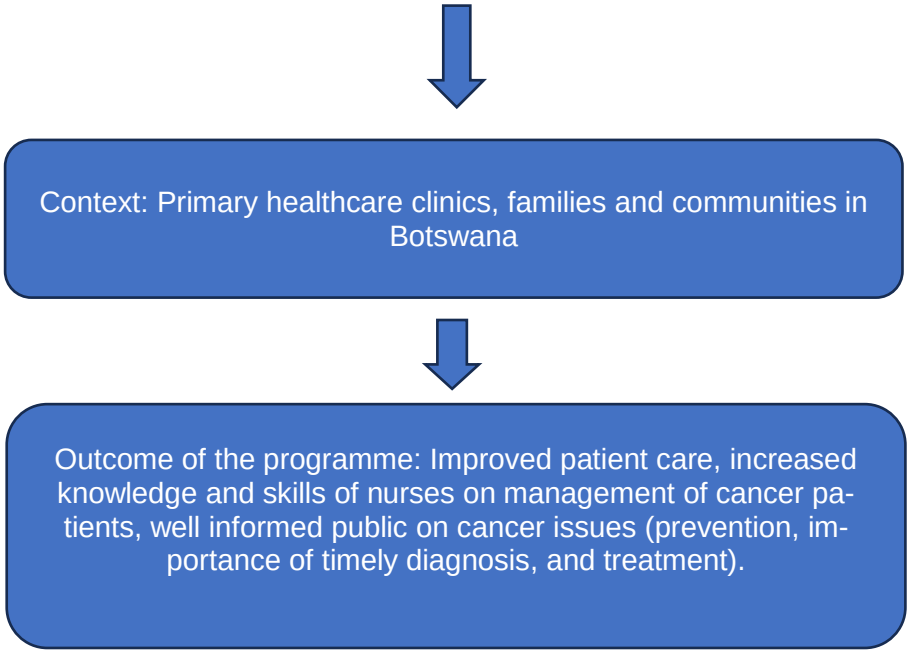


Figure 7.1: Conceptual Framework based on Dickoff et al.'s (1968) model to guide program development, researchers' thinking map

This thinking map is used to describe nurses' perceptions of cancer care in primary health care clinics and the procedures to be followed to address the identified gaps. The framework links fundamental ideas to address gaps in the management of cancer patients by non-oncology-trained nurses at primary healthcare clinics in Botswana. This was done to facilitate improved patient care for cancer patients at this level of facilities.

7.3 DESCRIPTION OF A CONCEPTUAL FRAMEWORK

This conceptual framework depicts a process that guides its development and use to develop a programme to facilitate cancer service delivery in primary healthcare clinics in Botswana. The six crucial survey list questions by Dickoff et al. (1968:415-434) influenced the process as discussed below.

7.3.1 The agent in the programme

An agent is a person who performs the activity (Dickoff et al. 1968). Meleis (2012:130) states that agents are expected to bring about desired results. It is important that

nurses at primary healthcare clinics, as agents, possess appropriate attitudes, knowledge, and skills to provide care to cancer patients towards recovery and survivorship, empower their caregivers to continue care at home, and provide support to family caregivers.

It is crucial that, as non-oncology-trained registered nurses in primary health care clinics, they possess the skills, knowledge and attitudes which are critical in the management of cancer, at all levels of care such as prevention; i.e. they should empower communities to seek health services in a timely manner to prevent late diagnosis and should also provide care and support accordingly to those already diagnosed and on home care.

Non-oncology-trained nurses play a very important role in cancer care, especially in low- and middle-income countries like Botswana, particularly in providing initial support and ongoing care for patients outside specialised oncology units, such as in primary healthcare clinics (World Health Organisation on Cancer 2022). It is worth noting that in countries like Botswana, cancer patients cannot be admitted to specialised units until full recovery, because of the resource challenges. Therefore, patients are diagnosed, initiated on treatment, and discharged home, and primary healthcare clinics are supposed to serve as a source of support for patients and their caregivers (Challinor, Galassi, Al-Ruzzieh, Bigirimana, Buswell, So, Steinberg & Williams 2016:154-163). While registered nurses in primary healthcare clinics lack specialised oncology training, their roles include direct patient care, patient navigation, health education for patients and their caregivers, and care coordination (Young, Charalambous, Owen et al. 2020:555-63).

Effective communication and a commitment to providing holistic care are crucial for non-specialist nurses working with cancer patients (Kachimanga, McGlashan, Cunningham & Hoyle 2023:1136).

Below are the expected roles to be played by non-oncology trained nurses in primary health care clinics:

7.3.1.1 Initial contact and navigation of cancer patients

Non-specialist nurses often serve as the first point of contact for patients with cancer, particularly in the clinics. They can help patients navigate the healthcare system, schedule appointments, and access necessary resources for diagnosis and ongoing care after initiation of treatment.

7.3.1.2 Direct Patient Care

Direct patient care involves all clinical activities that directly support the patient's physical, emotional, and functional needs during diagnosis, treatment, and recovery(National Cancer Institute 2024). Tasks like follow-up care on cancer treatment, which include wound care, medication administration (with appropriate training and protocols), monitoring vital signs, and providing emotional support and necessary referrals, go beyond the nurses' capabilities as well, for counselling when indicated.

7.3.1.3 Education and Communication

Non-oncology-trained registered nurses should be empowered to educate patients and their families about cancer treatment, side effects, and self-care strategies, including communication in health care settings. They also play a role in educating nursing assistants about the specific needs of cancer patients.

7.3.1.4 Emotional Support

Cancer patients need ongoing emotional support, which entails providing a listening ear, offering empathy, and helping patients cope with the emotional impact of a cancer diagnosis. These are essential aspects of nurses' roles in primary healthcare clinics (WHO Report on Cancer 2022). Assessing anxiety, depression, fear, and emotional distress. Facilitating support groups or referrals to psychologists or social workers for counselling, reassurance, and coping support.

7.3.1.5 Coordination of Care

Non-oncology-trained registered nurses ought to coordinate care between the interdisciplinary team, ensuring a smooth transition along the referral pathway. They

should collaborate with oncologists, pharmacists, dietitians, palliative care teams, social workers, and physiotherapists, ensuring smooth transitions between inpatient, outpatient, home, and palliative care.

7.3.1.6 Communicating effectively

Effective communication is crucial; non-oncology trained nurses need training and support to develop strong communication skills with cancer patients and their families. A diagnosis of cancer is often associated with death, and therefore, effective communication is very important. A study by Lounsbury, Nichols, Asuzu, Odiyo, Alis, Qadir, Nichols, Parker and Henry (2023:37-47) on cancer care settings in Africa found that only 40% of nurses and 20% of physicians had formal communication training. Similar studies in Kenya and Belgium have also shown that lack of communication training is a major challenge in cancer care (Henry, Nichols, Hwang, Nichols, Odiyo, Watson, Alias, Parker, Kissane, Asuzu & Lounsbury 2021:49; Horlait, Chambaere, Pardon Deliens & Van Belle 2016:3873-81). Cancer patients need continuous, individualised communication, as well as communication within support groups, with caregivers, and with families. In this study, cancer patients and nurses reported it as non-existent, hence the need for the program to empower nurses in primary care clinics. Therefore, to perform these key roles as agents in cancer prevention and management, non-oncology-trained nurses should be empowered and supported through a program to ensure standardised care.

7.3.2 The recipient of a program

A recipient is the person who benefits or receives action from agents. Recipients of a program in this study would benefit from strategies developed to empower non-oncology trained nurses to provide effective cancer management in primary healthcare clinics. The conceptual framework depicts cancer patients as recipients of care and as the focus of nursing care activities.

7.3.3 The programme context

The context is the healthcare environment in primary healthcare clinics, home, and community settings, where various healthcare activities take place (Dickoff et al. 1968:415-434). In this study, the context refers to primary healthcare clinics, patient

home settings and the community. Nurses are supposed to provide care at the primary health care clinics, at patients' homes and provide health education on cancer prevention, care and support to the larger community, engage with different key people in the community like traditional Healers, spiritual and other influential people because they can be utilised to get the community change their lifestyle and adopt more healthier behaviours as part of cancer prevention and to timely seek medical attention to avoid delays in diagnosis and treatment initiation.

7.3.4 Procedure for programme implementation

The procedure refers to techniques or activities that enable the activity to be performed (Dickoff et al. 1968:415-434). The procedures guide nurses' empowerment, enabling them to deliver quality care to cancer patients. These activities involve: in-service training for nurses in clinics; strategies to build a multidisciplinary team; community liaison/linkages; support groups; family involvement; patient involvement; community participation; and involvement of key stakeholders and traditional and spiritual leaders.

7.3.5 The dynamics of the programme framework

Dynamics of an activity refers to an energy source for the agent and recipient or context of the activity (Dickoff et al. 1968:415-434). The dynamics of this framework refer to the strategies that can be employed to facilitate the provision of quality care to cancer patients. Dynamics involves capacitating nurses/RNs in primary healthcare clinics with training, provision of individualized care to cancer clients, patient engagement, having qualified oncology nurses, multidisciplinary team, provision of resources, policies and standards in cancer management, mobilization and empowerment of other stakeholders such as traditional doctors, herbalists and spiritual Healers to be brought on board regarding cancer as a condition because some patients associate cancer to traditional causes.

7.3.6 Terminus or outcome of programme framework

The terminus is the endpoint of the process (Dickoff et al. 1968). This is the cancer patient's ability to develop coping skills, due to the quality of care provided at primary healthcare clinics by nurses and other healthcare professionals. Acquired knowledge

and skills by nurses on management of cancer patients following training, leading to improved patient care, increased knowledge, and skills of nurses on management of cancer patients, and a well-informed public on cancer issues (prevention; importance of timely diagnosis, and treatment navigation). All of these lead to better patient outcomes and improved survival.

The conceptual framework then guided the development of a programme on cancer service delivery in primary health care clinics, as presented below.

7.4 DEVELOPMENT OF A PROGRAMME FOR CANCER SERVICE DELIVERY IN PRIMARY HEALTH CARE CLINICS

Primary health care has been proven to be the most equitable, effective, and cost-effective way to enhance the health of populations (WHO Report on Primary Health Care 2018). This is achieved through the integration of health service programs. Health service programs are very important in guiding healthcare workers by providing a framework for consistent, high-quality care, mitigating risks, and promoting worker well-being (Bauer, Bodenheimer, Olayiwola & Syer 2015:1-20). Health service programs ensure that healthcare professionals have the necessary knowledge, skills, and resources to deliver safe and effective care (Jakab, Farrington, Borgermans & Mantingh 2018).

Health service programs establish clear guidelines and protocols, hence ensuring consistency in the application of best practices across different health care settings (Jakab et al. 2018). Thus, leading to improved patient outcomes and less variation in care quality. Well-defined health service programmes lead to smooth workflows and clear communication, optimising the use of resources and enhancing overall efficiency in healthcare delivery (WHO Framework on integrated people-centred health services 2016).

In this study, Phase 1 results indicated that nurses in primary healthcare clinics have a lack of knowledge and skills in managing cancer, leading to delays in diagnosis and substandard care for cancer patients where there are attempts to provide such services. The quantitative strand of Phase 1 further indicates cancer patients' dissatisfaction with the services they receive from primary health care clinics, and they rated the

services as poor. This gap was identified along the cancer care pathway, and the nurses indicated the need for a program to guide cancer services in their clinics. Bauer et al. (2015) assert that training and educational components within programs equip healthcare workers with the latest knowledge and skills, fostering continuous professional development. Programs can be designed or tailored to specific needs, such as the management of chronic diseases like cancer, mental health services, or the care of vulnerable populations (WHO 2022).

7.4.1 Development and description of cancer service delivery programme

The increasing number of cancer patients in low-and middle-income countries LMICs puts a lot of pressure on available resources, which are often inadequate to meet demand (WHO 2022; GLOBOCAN 2023). Therefore, nurses practising in any care setting are likely to encounter cancer patients and their families at various points along the continuum of cancer service delivery. Registered nurses in primary healthcare clinics lack the education or practice standards around cancer care required to support their professional practice in caring for individuals with cancer. Chapter 4 presented the results of Phase 1 from the two strands of the study: qualitative and quantitative approaches.

The findings indicated a gap, and nurses recommended a system-strengthening programme to help them improve care for cancer patients. Then Chapter 7 introduces a programme development framework guided by Dickoff et al. (1968:433). Practice-oriented theory, applying the six components or survey list of key questions, led to the development of a conceptual framework that now became the foundation for the programme. The purpose of the conceptual framework is to facilitate the development of a program to deliver quality cancer services by nurses in primary healthcare clinics in Botswana. The cancer service delivery program aims to guide nurses in primary healthcare clinics in the management of cancer, facilitate timely diagnosis and referrals, and provide comprehensive home care for cancer patients.

The in-service oncology training program aims to empower and guide non-oncology-trained nurses in cancer management. The programme was developed and validated, but not implemented due to a lack of funding. It is envisioned to run for 5 days for

content delivery conducted face-to-face, plus 2 weeks of follow-up at clinics for mentorship by oncology nurses and the researcher for on-site supervision.

7.4.1.1 Programme goal

To equip non-oncology trained nurses with essential knowledge and practical skills for early cancer detection, safe symptom management, patient education, and referral, improving cancer care quality and patient safety in resource-limited settings.

7.4.1.2 The objectives of the programme address

- The need for in-service training for nurses in primary health care clinics.
- Reduction of the risks, incidence, and burden of cancer by encouraging healthy lifestyles.
- Promotion of early detection through self-care/examination, awareness campaigns, and information on cancer symptoms.
- Improving the management of cancer symptoms and side effects throughout the disease trajectory.
- Coordination of complex care needs.
- Below are the expected outcomes of the programme.

7.4.1.3 Expected outcomes of the programme

- Improved early detection and timely referral.
- Enhanced patient safety and symptom control.
- Reduced treatment delays and complications.
- Empowered nurses with confidence and competence in cancer care.
- Improved quality of life of patients and long-term care.

7.4.2 Programme Activities

The In-Service Oncology Training Programme for Registered Nurses in primary healthcare clinics is envisioned to be implemented through a 5-day workshop for content delivery, held at the district health management team conference rooms at the study sites, to accommodate more nurses from the different primary healthcare clinics in each area. Below is a table with structure details.

Table 7.1: Programme Activities: A programme for cancer service delivery in primary health care clinics- training phase for nurses in clinics.

Pre-activity phase (planning stage)	**Welcome, introductions, objectives, ground rules, and expected outcomes**		
Days	**Content**		**Facilitator**
	Major topic	**Sub-topics**	
Day 1	Introduction to Oncology Session 1	Global and local cancer burden. Risks for developing cancer/predisposing factors. Common cancers in LMICs (breast, cervical, prostate, colorectal). Role of nurses in early detection and navigation, WHO (2017), Ginsburg et al. (2017).	Researcher
	Early Detection and Referral	Identifying early cancer warning signs: Health assessment Initial screening investigations (primary prevention) common cancers: Breast, cervical, prostate, colorectal, lung, liver, oesophageal. Investigations: Confirmatory tests and staging/additional investigations.	Oncology Nurse Specialist
	Session 2	Referral pathways and documentation Components of effective referral Clear protocols for referral from primary to tertiary care. Patient navigation by nurses or community health workers. Use of digital tools (SMS reminders, telemedicine) to track referrals. International Council of Nurses (ICN). Nurses: A Voice to Lead – Nursing and Cancer Care (2022).	

		WHO *Guide to Early Cancer Diagnosis* (2017), NCCN Harmonized Guidelines SSA.	
Day 2	Summary of the previous day's proceedings.	Recap: Questions, clarifications.	Palliative Care Nurse
	Symptom management and palliative care. Session 1	Cancer staging and implications Cancer treatment modalities and care, common side effects. Cancer staging and implications Cancer treatment modalities and care, common side effects. WHO pain ladder and opioid safety. Managing nausea, fatigue, mucositis, and psychological distress. WHO (2018), ASCO; Palliative Care Guidelines (2016).	
	Cancer emergencies. Session 2	Common cancer emergencies (WHO aligned). *Structural*: spinal cord compression; airway obstruction; increased intracranial pressure; brain metastases. *Metabolic*: hypercalcaemia; tumour lysis syndrome; SIADH-induced hyponatraemia. *Hematologic*: Febrile neutropenia; hyperviscosity syndrome; massive bleeding. *Cardiovascular*: Cardiac tamponade (malignant pericardial effusion). *Neurologic:* Carcinomatous meningitis. *Treatment-related*: Chemotherapy extravasation; acute hypersensitivity reactions. Initial stabilisation and urgent referral. ESMO Clinical Practice Guidelines (2021).	Oncology Nurse Specialist

Day 3	Summary of the previous day's proceedings.	Recap: Questions, clarifications	Oncology Nurse Specialist
	Patient education and psychosocial support. Session 1	Understanding the diagnosis – communication Explanation of cancer type, stage, and prognosis. Importance of early detection and treatment adherence. Treatment modalities: Surgery, chemotherapy, radiotherapy, immunotherapy, and targeted therapy. Expected benefits, risks, and side effects. Medication and symptom management: How to take medications safely. Managing pain, nausea, fatigue, and other treatment-related symptoms.	
	Session 2	Nutrition and Lifestyle. Dietary recommendations during and after treatment. Physical activity guidelines and smoking/alcohol cessation. Self-care and monitoring. Recognising warning signs of complications. Importance of follow-up visits and screening for recurrence.	

Day 4	Recapping of previous days' discussions. Patient education and psychological support Session 1	Questions, clarifications. Infection prevention. Hygiene practices and neutropenia precautions. Financial and practical guidance Available financial aid and community resources. Psychological support and coping strategies. Stress management techniques (mindfulness, relaxation exercises, and rest). Building resilience and positive coping mechanisms.	Palliative Care Nurse/Palliative Care Specialist/ Psychologist
	Session 2	Emotional adjustment. Addressing fear, anxiety, depression, and communication skills. Addressing emotional responses to diagnosis and treatment. Support systems Body image and self-esteem Palliative care and end-of-life discussions.	
Day 5	Recapping, evaluation, and way forward. Session 1	Summary and assessing learning outcomes. Conclusion and way forward. Making recommendations.	Led by the researcher.

Teaching methods:

- Interactive lectures with case studies.
- **Skills stations** (breast exam, pain assessment, emergency drills).
- **Job aids**: referral algorithms, pain ladder cards.

Assessment:

- Pre- and post-training knowledge tests.
- Reflective practice logs.
- Follow-up audits on referral and symptom management practices.

7.4.3 Process

Table 7.1 (above) shows the structure of the In-service Oncology Training Programme to facilitate non-oncology nurses in primary healthcare clinics in providing care to cancer patients. The structure is unpacked to show the content in detail, with illustrations to clarify it for trainees. The programme's development process is based on the findings from the two approaches of the study. Cancer management, by nature, requires a collaborative approach by an interprofessional team; therefore, the programme's approach is also collaborative. This approach promotes ownership of the programme among all team members.

The elaborate content to be covered is guided by the structure in Table 7 and is expected to run 2 sessions per day for 5 days, delivered face-to-face. Other aspects of training on practical components include simulation exercises on health assessment, communication, and emergency management, as well as onsite follow-up and mentoring for two weeks by the researcher, with support from oncology nurse specialists as experts in the area. The on-site follow-up is to support nurses in primary healthcare clinics with mentoring for skill acquisition, such as health assessment, signs and symptom management, patient communication, and psychosocial support. The researcher and oncology nurses are envisioned to move around primary healthcare clinics for on-site support.

The three phases of the cancer management programme are discussed below.

7.4.3.1 Pre-active phase (programme planning stage)

This phase focuses on preparation before the actual in-service training takes place. This entails engaging with primary healthcare clinic managers to facilitate the release of nurses to attend the training. This type of training is recognised by the Nursing and

Midwifery Council of Botswana Act (1995) as part of continuous professional development (CPD) and attracts the CPD points required for the renewal of practising licences. The logistics of who should attend would be decided by the nurse managers, who would notify the researcher. The clinics should continue running even when the training sessions are on; therefore, the decision on how many nurses to release to attend the training is the responsibility of the nurse managers, as they know their clinics' staffing patterns better. The training is envisioned to take place for one week (5 days) for content delivery, followed by two weeks of on-site follow-up and mentoring.

Activities to be engaged in are to ensure effective learning experiences, such as practical training components, and use of simulation scenarios to practice communication, symptom assessment, and emergency management, and aspects of mentorship are to be clarified, which entails nurses doing the practical component in primary healthcare clinics where they are working so that they can continue with their daily work during the practical component of the program. Any resources, such as materials required to support the program and a suitable venue for each study site, would be mobilised through nurse managers at the primary healthcare clinics.

7.4.3.2 Interactive phase (the envisioned programme implementation)

7.4.3.2.1 Programme Facilitation: Nurses' In-service Training Program for cancer management in Primary Healthcare clinics.

The programme is envisioned to run over a period of three weeks: 5 days for content delivery and 2 weeks for on-site follow-up and support. The researcher would source relevant facilitators for different topics based on expertise. At the beginning of the introductory session, the researcher would lead introductions by all and set ground rules, e.g., respect and confidentiality, as some participants may share their personal experiences with cancer. This would be followed by the researcher's overview of the program. Before each session, the expected outcomes are explained to participants. The topics would be covered as indicated in the program structure (Table 7).

The researcher is responsible for introducing the first topics, and other sourced facilitators would cover topics according to their expertise, as indicated in the program structure. The mode of instruction is English. The content would be discussed over five (5) days, two (2) sessions: one in the morning and the other in the afternoon, from

0745–1600 hours, with refresher and lunch breaks in between. The proceedings would be as follows.

Day 1 session 1: An overview of the programme to be explained to the participants. An introduction to oncology to be done with emphasis on low- and middle-income countries. On global and local cancer burden, common cancers in LMICs and in Botswana, such as breast, cervical, prostate, colorectal, lung, liver and oesophageal. Risk factors for cancer and the role of nurses in cancer management; prevention, early detection, and treatment navigation.

Common cancers in low- and middle-income countries(LMICs)

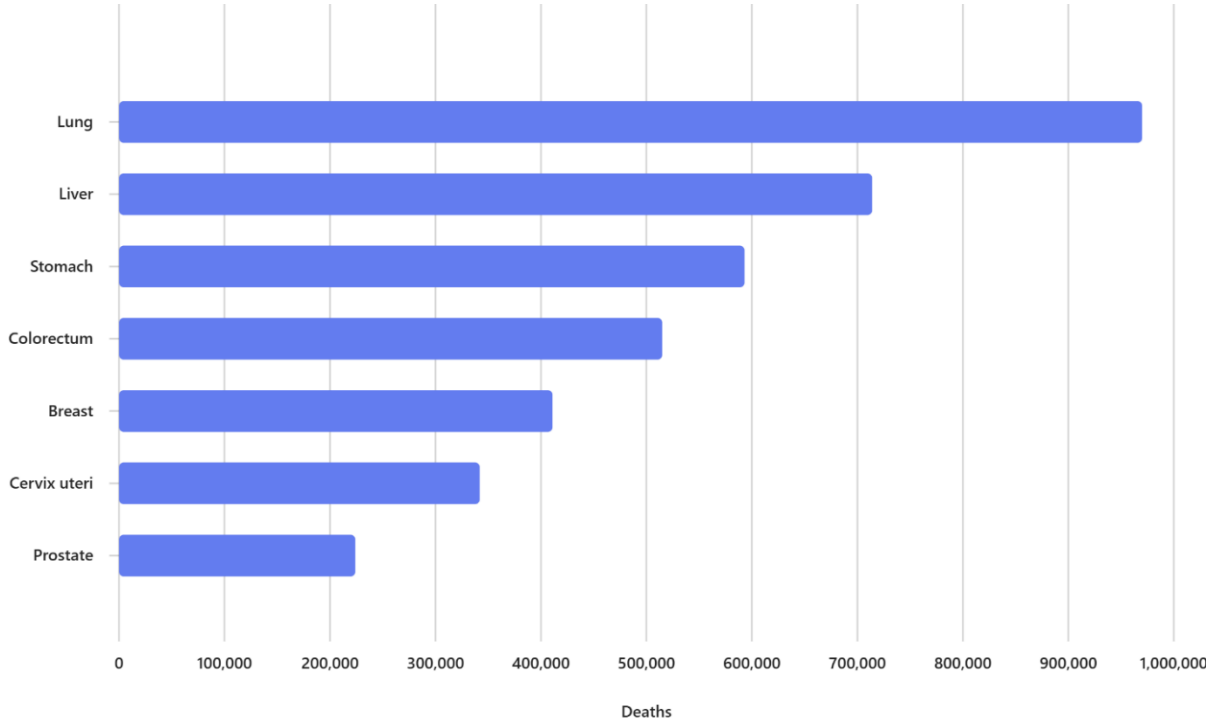


Figure 7.2: Common cancers in LMICs (GLOBOCAN 2022 [IARC], WHO)

7.4.3.3 Global burden of cancer

The recent global estimates according to WHO (2024) show that cancer remains one of the world's leading causes of morbidity and mortality. There were 20 million new cancer cases and 9.7 million deaths worldwide in 2022. Furthermore, 1 in 5 people are expected to develop cancer in their lifetime; 1 in 9 men and 1 in 12 women will die from cancer (WHO 2022-2024). Cancer cases are expected to reach 33 million per

year by 2050, with 18 million annual deaths (American Cancer Society 2025). The top cancers worldwide in 2022 were lung (2.5 million cases), breast (2.3 million cases), colorectal (1.9 million cases), prostate (1.5 million cases), and stomach (0.97 million cases) (GLOBOCAN 2022). Regarding low- and middle-income countries (LMICs), 75% of global cancer deaths occur in LMICs (Barclay, Curtis-Hughes, Evans & Raval 2024). *The Lancet* (2025) indicates that in 2050, over half of all new cancer cases and two-thirds of all new cancer deaths are projected to occur in LMICs. GLOBOCAN (2022) indicates that Botswana recorded 2,317 new cancer cases and 1,277 deaths in 2022. According to how the Botswana Healthcare system is structured, most of these cancer patients pass through primary healthcare clinics; hence, nurses in these clinics need skills to manage cancer accordingly.

7.4.3.4 Risk factors for cancer

This topic would start with questions and discussion on risk factors, because these are nurses who already handle some NCDs, such as hypertension, diabetes, and chronic obstructive pulmonary disease, and most predisposing factors cut across all NCDs. The *Cancer Atlas* reports that an estimated 50% of all cancer deaths worldwide are attributed to modifiable risk factors, commonly referred to as lifestyle factors (American Cancer Society 2025). Anandasabapathy et al. (2024) indicate that as economies grow, LMICs experience increased alcohol consumption, obesity resulting from poor diet, physical inactivity, tobacco use, and other environmental exposures, such as pollution and industrial toxins, resulting from industrialisation. These factors collectively contribute to rising cancer burden and the high HIV and AIDS prevalence, which also pose a risk to a specific type of cancer called Kaposi's Sarcoma.

7.4.3.5 The role of nurses in early detection and navigation

In LMICs, like in Botswana, late-stage diagnosis is prevalent due to limited access and awareness. Nurse-led interventions significantly improve early detection rates and treatment initiation (International Council of Nurses, ICN 2022).

Nurses' roles in screening and risk assessment require them to: (i) conduct community-based screening for cancers such as breast (clinical breast exams), cervical (visual inspection with acetic acid or Pap smears), and colorectal (FIT tests). They should

identify high-risk individuals through risk factor assessment (family history, DNA predisposition); therefore, it is important to ask relevant questions, such as whether any family members of the patient had cancer. Lifestyle factors like tobacco use, alcohol intake (frequency and amount), occupational exposure, type of employment, and exposure to agrochemicals are considered because some heavy metals are encountered in the line of duty. (American Cancer Society ACS 2023). The other critical role is (ii) health education. Nurses educate communities and individual patients on warning signs as part of prevention and early detection, breast self-examination techniques, and a chart on self-examination (Figure 7.2) to be provided, with the importance of timely screening to be emphasised. Also, other important warning signs as part of health education include the appearance of a new lump or swelling anywhere on the body, especially under the skin, skin changes, sores that do not heal, jaundice (yellowing), or changes in existing moles (nurses should apply the ABCDE rule: Asymmetry, Border, Colour, Diameter, Evolving). Also, nurses should address the importance of diet to avoid obesity, sugar, and foods high in sugar, and the importance of physical activity. Nurses should address myths and stigma that often delay early presentation in LMICs, and from the study, they shared that some patients associate cancer with traditional beliefs. This came up in the study and should be shared with nurses, as one of the common delays, as communities often associate cancer with traditional beliefs such as witchcraft and curses, and this delays them from coming for results. The other role is (iii) referral and follow-up. Nurses are to ensure prompt referral of abnormal findings to diagnostic centres and should track patients for follow-up.

Nurses' roles in navigation, as well as the importance of (iv) care coordination, will also be discussed. Nurses act as patient navigators and are expected to guide individuals through complex health systems for screening and treatment (ICN 2022). Psychological support (to be discussed in detail by the Palliative Care Specialist) should be provided. Nurses should be urged to provide counselling and/or refer to counselling for cancer patients, as it is very important to reduce anxiety and improve adherence to treatment plans. Lastly, under patient navigation is resource linkage. Nurses are expected to connect patients to transportation; at least, this is a role most nurses play and do for different types of patients who need referral to a higher level of care. How-

ever, findings indicated a challenge: a shortage of transport. Also linking cancer patients to support groups, which they indicated were non-existent in the study, and after training, they must work with communities to mobilise them to form support groups.

Some of the pictures to be shared on self-breast examination

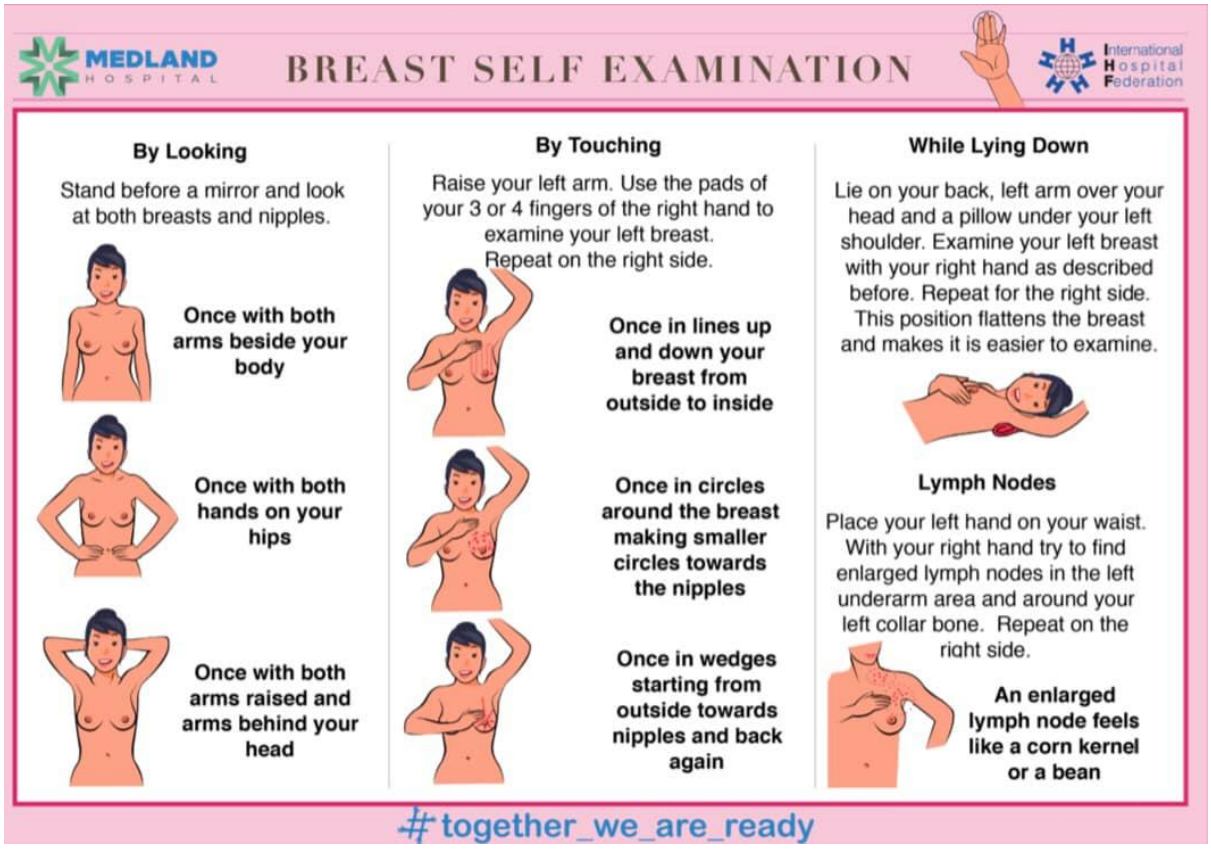


Figure 7.3: Self-breast examination by Medland Hospital (2019).

The differences between normal human cells and cancer cells will be shared to set the stage for presentations on different topics and facilitate understanding.

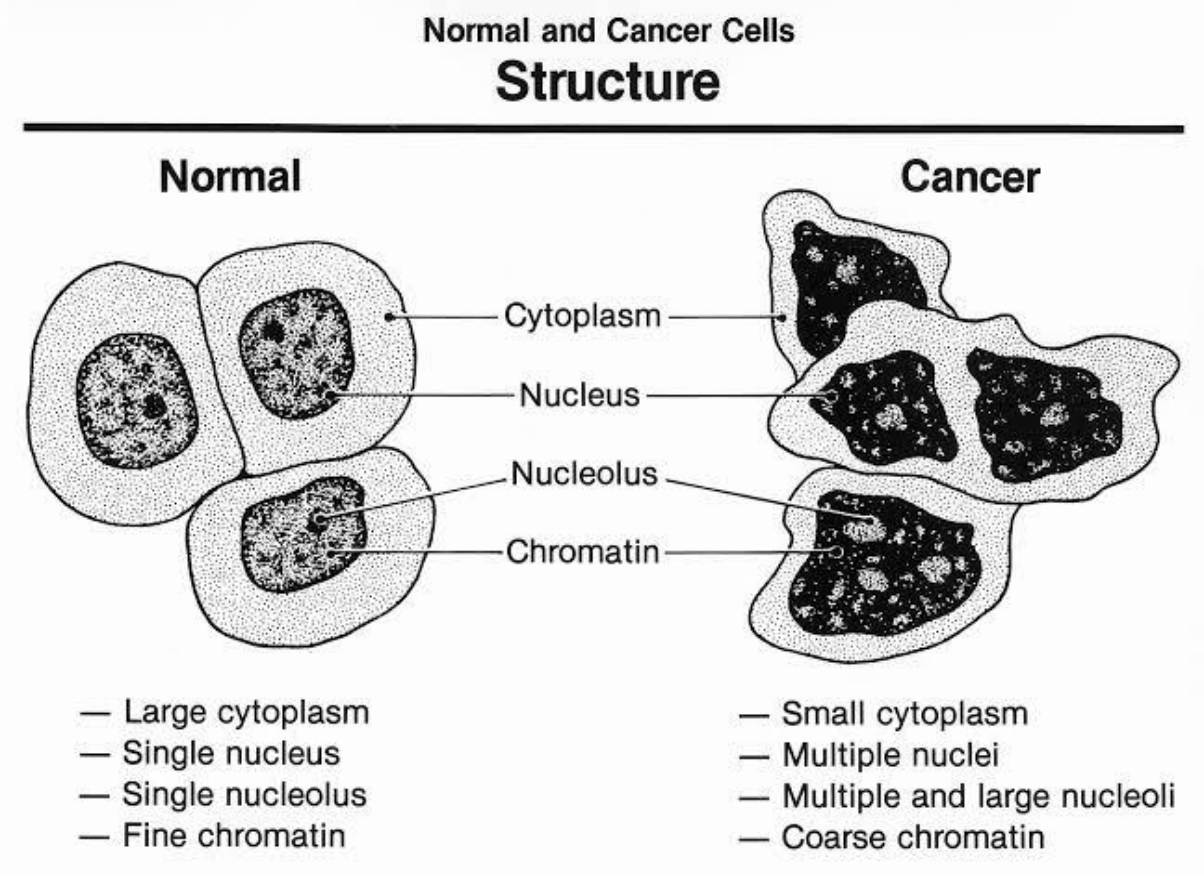


Figure 7.4: Normal human cells and cancer cells

Image courtesy: National Cancer Institute 2001; B&W, Medical illustration; AV-9004-3728, National Cancer Institute; USA.gov)

At the end of this presentation session, the researcher is to allow the nurses to ask questions and share experiences.

Day 1 session 2: To cover early detection and referral

The importance of early detection will be discussed, since the programme trainees are registered nurses and may have some knowledge. Session 2 will start with discussions, posing questions to the nurses before giving them information where they are lacking. Early detection improves survival and reduces treatment costs, and WHO (2017) emphasises early detection as a key pillar of control.

Early detection is dependent on the individual's ability to report to the health facility any symptom that is new, persistent (lasting more than two weeks), getting worse, or does not go away, and these symptoms could be caused by many things, but medical

advice ensures early detection if it is cancer or not. Issues related to community outreach to empower communities with this information should be discussed. Strategies for Early Detection to be discussed, including population-based screening for Cervical cancer, such as VIA (Visual Inspection with Acetic Acid), Pap smear, and HPV testing. Clinical breast examination (CBE) and mammography, where feasible. Colorectal cancer screening, such as the Faecal Immunochemical Test (FIT), is to be discussed (IARC Handbooks of Cancer Prevention 2022). Nurses to be given insights during training that they can also use to train primary care providers to recognise warning signs such as lumps, abnormal bleeding, and persistent cough. Also, very key is community awareness campaigns on warning signs and common symptoms to reduce stigma and promote timely care (WHO 2020).

The common warning signs of cancer

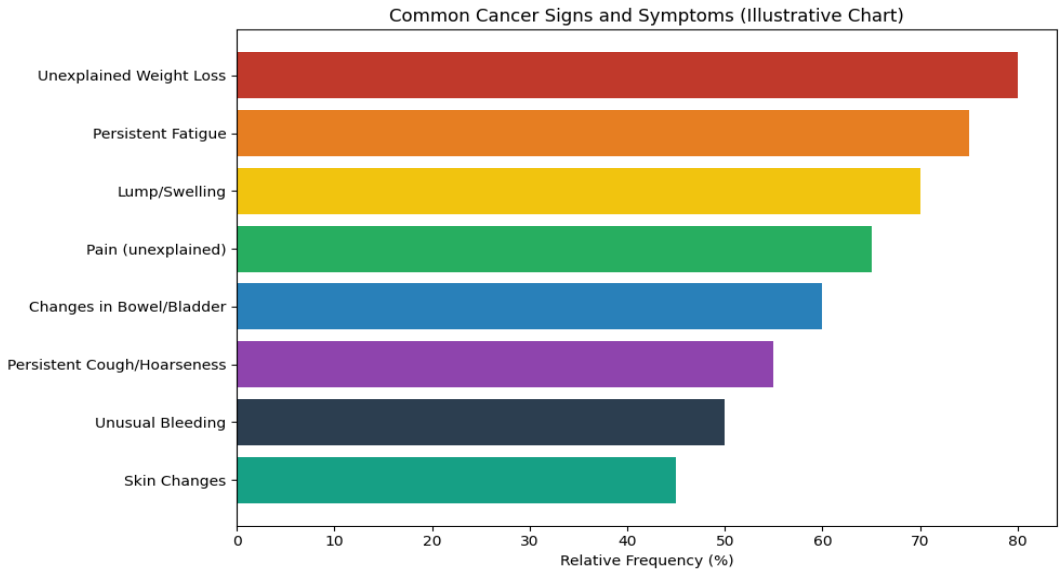


Figure 7.5: Common cancer signs and symptoms (WHO 2023)

Common cancer warning signs and symptoms to be discussed are: a new lump or swelling anywhere on the body, especially under the skin; skin changes and sores that do not heal; jaundice (yellowing), or changes in existing moles (use ABCDE rule: Asymmetry, Border, Colour, Diameter, Evolving). Bowel or bladder changes, persistent diarrhoea, constipation, blood in stool/urine, or needing to pee more often or urgently. Persistent cough or hoarseness, a cough that will not go away or having trouble speaking or swallowing. Unusual bleeding or discharge from any part of the body

opening (e.g. bottom, urine, or vomiting blood) or unusual discharge. Weight or appetite loss, such as unintentional weight loss, loss of appetite, or feeling full quickly. Fatigue or extreme tiredness that does not improve with rest. Pain: new, persistent pain without a clear cause. Night sweats (excessive sweating at night) or a persistent fever. Early detection leads to timely diagnosis and prompt staging.

Cancer staging and implications: To be discussed and described as the extent of disease spread at diagnosis. It is very critical for: i) treatment planning, ii) prognosis estimation, iii) research and clinical trial eligibility and iv) communication among healthcare.

providers. The most widely used system is the TNM (Tumour, Nodes & Metastasis) Classification by the American Joint Committee on Cancer (AJCC) and the Union for International Cancer Control (UICC).

TNM System

- T (Tumour): Size and extent of the primary tumour.
- N (Nodes): Involvement of regional lymph nodes.
- M (Metastasis): Presence of distant metastasis.

Stages are grouped into:

- Stage 0: Carcinoma in situ (localised, non-invasive).
- Stage I-II: Localised disease (early stage).
- Stage III: Regional spread (advanced but potentially curable).
- Stage IV: Distant metastasis (advanced, often incurable).

The process of metastasis

Metastasis is the multi-step biological process by which cancer cells spread from the original (primary) tumour to distant organs. It is responsible for most cancer-related deaths because metastatic tumours are harder to treat and often resistant to therapy. The process involves six steps; the diagram below summarises them.

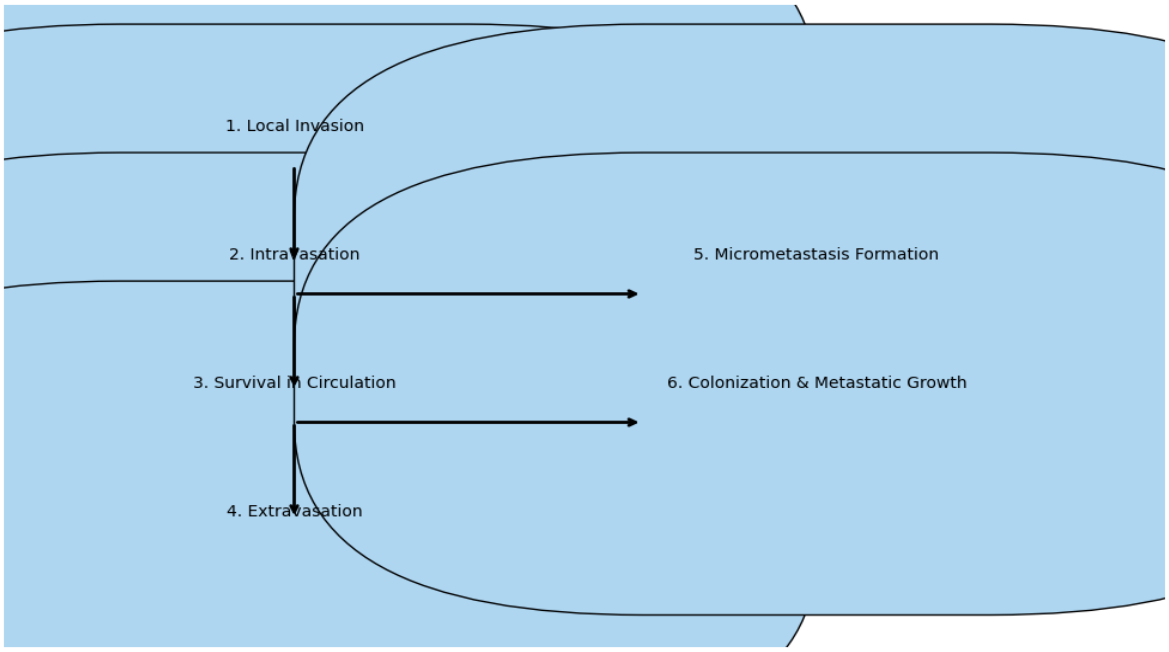


Figure 7.6: The six key stages involved in metastasis(WHO 2019; NCI 2023):

- Local invasion – Tumour cells invade nearby tissue.
- Intravasation – Cancer cells enter blood/lymph vessels.
- Survival in circulation – Cells travel through the bloodstream.
- Extravasation – Cells exit vessels into distant tissue.
- Micro metastasis formation – Tiny clusters begin to grow.
- Colonisation & metastatic tumour formation – Full secondary tumour develops.

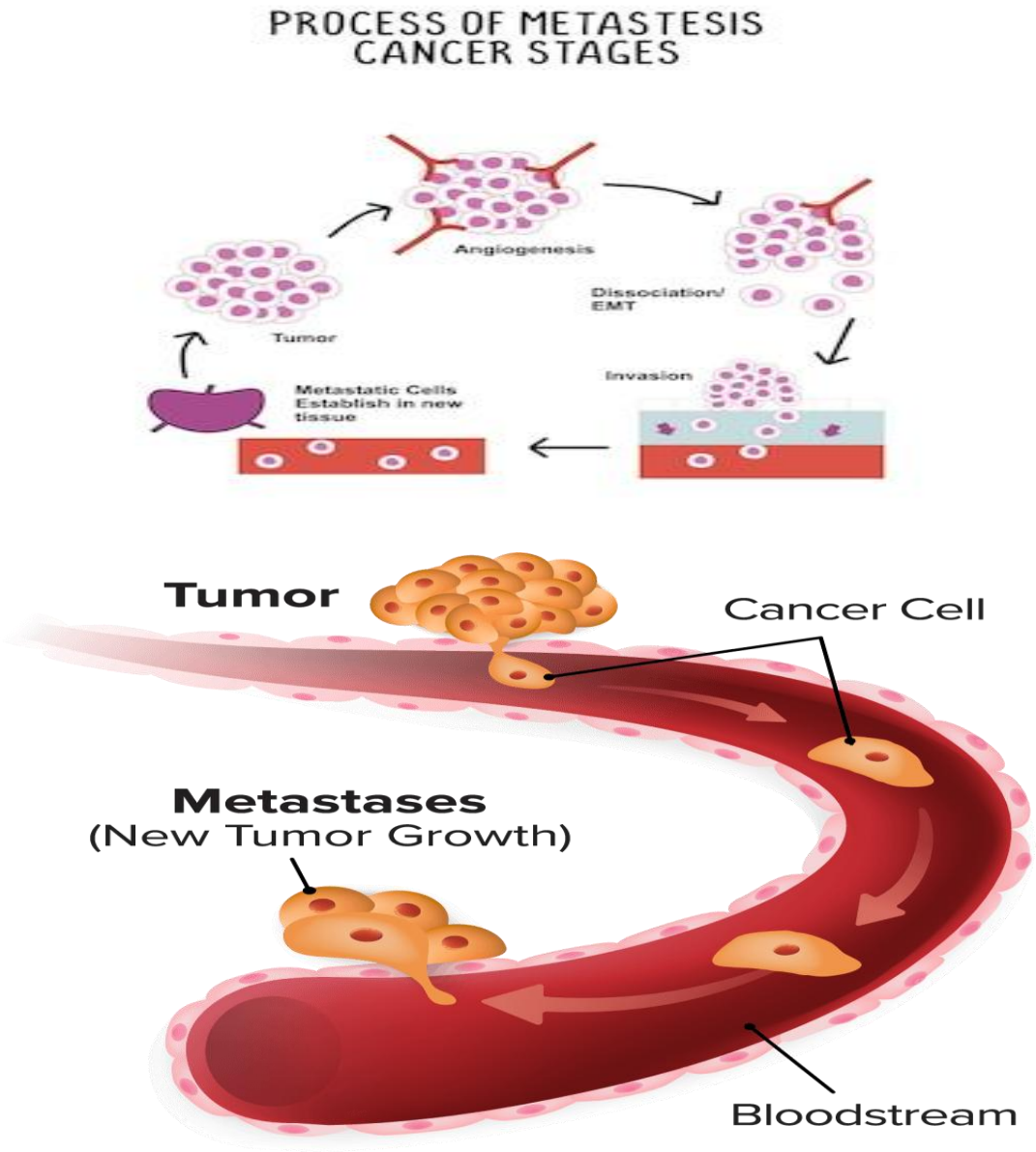


Figure 7.7: Process of metastasis (National Cancer Institute 2023)

Implications of Cancer Staging

Implications of Staging are important for treatment decisions**,** prognosis, resource allocation, and patient counselling:

- Early stages (I–II): Surgery ± adjuvant therapy.
- Stage III: Multimodal therapy (surgery, chemo, radiation).
- Stage IV: Palliative care, systemic therapy**.**
- Prognosis.

- Higher stage = poorer survival.
- Resource Allocation.

In LMICs, staging helps prioritise limited resources for curative vs palliative care.

Patient Counselling:

- Guides discussions on outcomes and expectations.
- Below is a summary and pictorial presentation of the stages of cancer.

Figure 7.8: Stages of cancer. Marshfield Clinic Health System (2023).

Day 1 session 2 should end with discussions on cancer care, treatment modalities, and common side effects. Psychological support and other forms of support, effective

communication, and a simulation on effective communication are very important and should be stressed. Referral pathways and documentation are to be discussed, followed by questions and discussion.

Day 2 session 1: Symptom Management and Palliative Care

Pain assessment in cancer patients

Pain is subjective, so self-report is the gold standard. However, there are validated, reliable pain assessment scales. One of the commonly used pain assessment scales among adults is the Brief Pain Inventory Short Form; the long form is reported to be suitable for research purposes.

Brief Pain Inventory – Short Form (BPI-SF)

This is a standardised, validated pain assessment tool, validated in surgical and medical oncology in a study titled "Validating the Brief Pain Inventory for use with surgical patients with cancer" by Tittle, McMillan, and Hagan (2003). Initially, it was developed to assess cancer-related pain, but has now become widely used for both cancer and non-cancer chronic pain (Andersson, Bergman, Henoch, Simonsson & Ahlberg (2019). According to Tittle et al. (2003), the Brief Pain Inventory measures two key dimensions of pain: pain severity or intensity and pain interference with activities of daily living or the patient's daily functioning, the latter of which hinges more on how pain affects quality of life. BPI is used to assess the following: it quantifies the severity of pain, assesses the impact of pain on the physical, emotional, and social functioning, monitors patients' response to pain treatment, guides clinical decision-making, and facilitates communication between patients and healthcare providers (Anderson Bergman, Henoch et al. (2019).

Nurses in Primary Healthcare clinics should understand how to assess the location of pain, its severity, and its interference with daily activities. Pain severity or intensity is measured using a four-item numeric rating scale (NRS). Patients rate their pain on a 0-10 scale, where 1-3 = mild pain, 4-6 = moderate pain, and 7-10 = severe pain. Furthermore, the four pain intensity items are: worst pain in the last 24 hours, least pain in the last 24 hours, average pain, and pain right now. Iii). Pain interference is one of

the most important strengths of the BPI, patients rate how much pain interferes with areas of daily life or quality of life on daily basis using a 0-10 scale as described above, where 0 = does not interfere and 10 = completely interferes, and this is assessed along the domains of general activity, mood, walking ability, normal work, relations with other people, sleep and enjoyment of life (WHO 2019). It captures both the physical and psychological impacts of pain and recognises pain as a multidimensional experience.

Nurses should assess pain relief from treatment by first asking patients about the pain treatments they are using, such as medications and radiotherapy, and the percentage of pain relief achieved. Pain relief from medication is expressed as a percentage: 0% = no relief, and 100% = complete relief. Whatever the outcome of the assessment, it facilitates adjustment of treatment plans accordingly (Tittle et al., 2003). The adjustment of treatment plans follows the WHO pain ladder and opioid safety. The WHO pain ladder and opioid safety were introduced by the World Health Organisation (WHO) in 1986 for cancer pain management; the ladder provides a stepwise approach. There are three steps:

Step 1: Mild Pain

- Non-opioids (e.g., paracetamol, NSAIDs)
- ± Adjuvants (antidepressants, anticonvulsants for neuropathic pain)

Step 2: Moderate Pain

- Weak opioids (e.g., codeine, tramadol)
- Non-opioids
- ± Adjuvants

Step 3: Severe Pain

- Strong opioids (e.g., morphine, oxycodone, fentanyl)
- Non-opioids
- ± Adjuvants
- Principles of opioid safety:
    - By the **mouth** (oral route preferred)

    - By the **clock** (regular schedule, not PRN).
    - By the **ladder** (stepwise escalation)
- Individualized dosing
- Opioid safety was discussed, and key safety measures were emphasised.
- Assessment before prescribing.
    - Evaluate pain severity, comorbidities, and risk of misuse.
- Start low, go slow.
    - Titrate dose carefully; monitor for side effects.
- Monitor for adverse effects.
    - Respiratory depression, constipation, and nausea
- Prevent misuse and diversion.
    - Secure storage, prescription monitoring
- Education
    - Teach patients and caregivers about correct use, side effects, and when to seek help.
- Naloxone availability
    - For opioid overdose emergencies

Below is a summary of the WHO pain ladder and opioid safety:

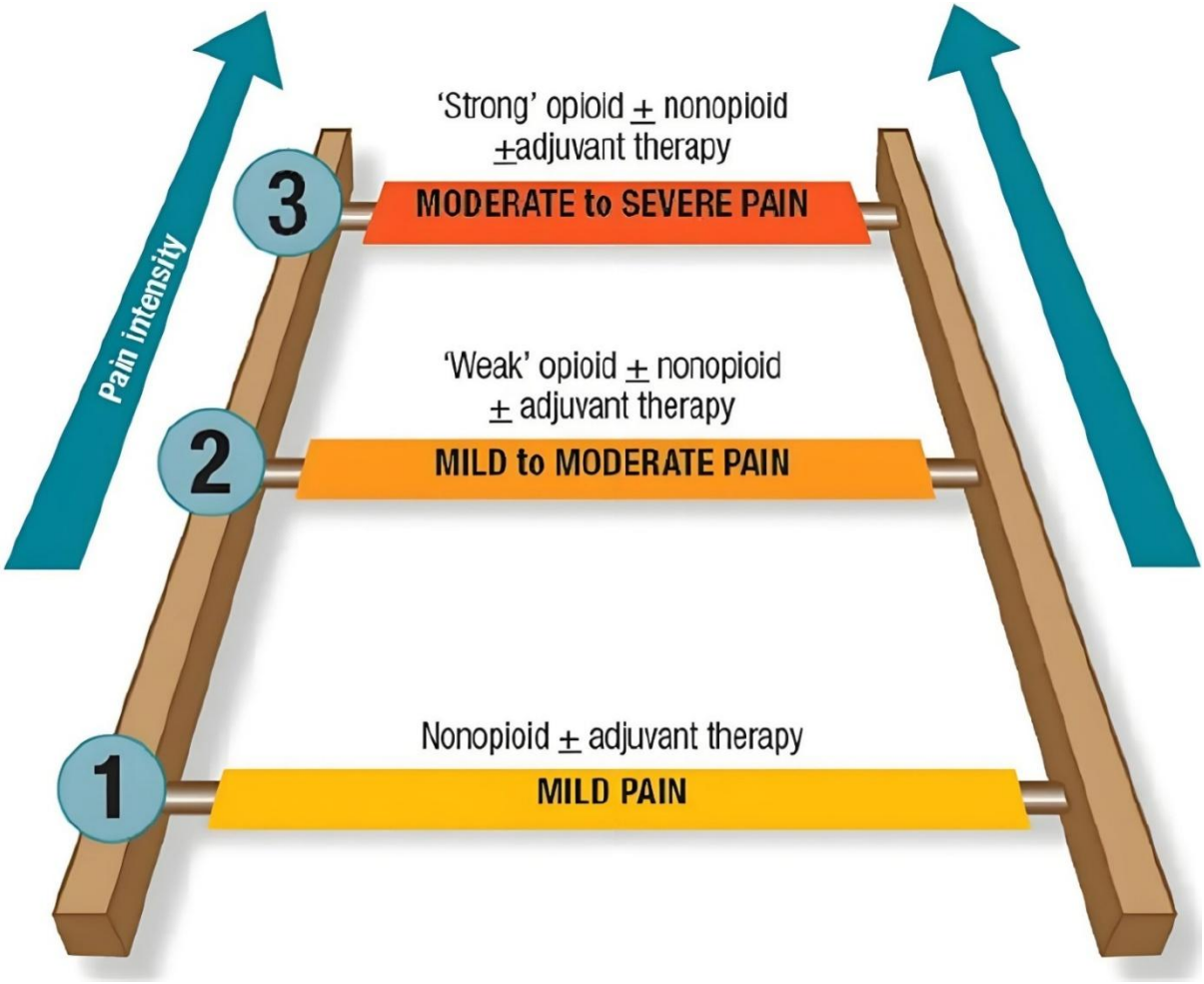


Figure 7.9: WHO pain ladder and opioid safety (WHO, 2020)

Special Considerations in LMICs

Many LMICs have opioid shortages due to regulatory barriers, and WHO advocates for rational opioid use to relieve suffering while minimising misuse (WHO 2020).

Day 2 session 2: During this session, cancer emergencies are to be discussed, including febrile neutropenia (time-to-antibiotics), spinal cord compression, tumour lysis syndrome, and initial stabilisation and urgent referral.

7.5 CANCER EMERGENCIES: ONE-PAGE WALL POSTER (COLOR-CODED) (WHO 2022)

Prompt recognition and first response in low-resource settings. (Post in triage, wards, treatment rooms)

SPINAL CORD COMPRESSION (MSCC)

Red flags: New back pain, limb weakness, sensory loss, bladder/bowel changes.

Immediate: Dexamethasone 10 mg IV stat → 16 mg/day; bed rest; urgent MRI/transfer.

Do not delay: Escalate to neurosurgery/radiation oncology.

FEBRILE NEUTROPENIA

Definition: Fever ≥ 38.3°C once or ≥38.0°C for ≥1 h + ANC ≤500.

Critical rule: GIVE IV ANTIBIOTICS WITHIN 60 MINUTES.

Steps: Draw cultures → start broad-spectrum IV antibiotic → monitor closely.

TUMOR LYSIS SYNDROME (TLS)

Risks: High-grade lymphomas, leukaemias, bulky/chemosensitive disease.

Immediate: Start IV hydration; give allopurinol or rasburicase (check G6PD); monitor electrolytes frequently.

Watch for: Hyperkalemia, hyperphosphatemia, AKI.

SUPERIOR VENA CAVA (SVC) SYNDROME

Symptoms: Facial/neck swelling, dyspnea, venous distention.

Immediate: Elevate HOB, oxygen, lower-limb IV access; avoid upper-arm BP/venipuncture.

Urgent: CT chest; airway compromise → emergency stenting.

HYPERCALCEMIA OF MALIGNANCY

Symptoms: Confusion, dehydration, constipation, arrhythmia.

Immediate: IV normal saline; bisphosphonate/denosumab; calcitonin for rapid effect.

Monitor: ECG, renal function, urine output.

MALIGNANT PERICARDIAL EFFUSION / TAMPONADE

Signs: Hypotension, JVD, muffled heart sounds (Beck triad).

Immediate: Oxygen, IV access, urgent echo if available.

Treatment: Emergency pericardiocentesis; catheter 2–5 days.

SEVERE SIADH (HYPONATREMIA)

Danger: Seizures, confusion, coma.

Immediate: 3% saline 100 mL bolus (repeat ×3 max) aiming +4–6 mmol/L; slow correction after.

Then: Fluid restriction; treat underlying tumour.

Legend: Blue = Neuro; Red = Infection/Sepsis; Green = Metabolic TLS; Orange = Thoracic Obstruction; Purple = Metabolic Hypercalcemia; Teal = Cardiac; Brown = Electrolyte (SIADH).

Adapt this poster with local drug choices and referral numbers.

Day 3 session 1: Patient Education and Psychosocial Support.

The emphasis here is on the patient's understanding of the diagnosis, including explanations of the cancer type, stages, and prognosis, as well as the importance of early detection and treatment adherence. Treatment Modalities such as surgery, chemotherapy, radiotherapy, immunotherapy, and targeted therapy. Expected benefits, risks, and side effects are also to be discussed. Medication and symptom management, including how to take medications safely and manage pain, nausea, fatigue, and other treatment-related symptoms. Patient education is provided in the oncology unit when the cancer patient is initiated on a treatment plan. However, since cancer is a psychologically taxing condition, nurses in primary healthcare clinics need to be aware of the importance of patient education to assess the patients' need for health education and psychological support.

Day 3 session 2: Patient education and psychological support.

To continue discussions on nutrition and lifestyle, which are key in cancer prevention, during management, and for the prevention of recurrence. Dietary recommendations during and after treatment, physical activity guidelines, and smoking/alcohol cessation. Self-Care and monitoring, such as recognising warning signs of complications and the importance of follow-up visits and screening for recurrence.

Day 4 session 1: Patient education and psychological support on infection prevention, hygiene practices, and neutropenia precautions to be discussed. Financial and practical guidance on available financial aid and community resources. Nurses to share experiences through discussions that the cost for cancer treatment is high and that some patients may have medical insurance, but it usually gets depleted before they complete treatment; such patients may feel distressed to access services from a public health facility, and they need psychological support to come to terms with the situation. Psychological support is very, very important and should be discussed, including coping strategies for stress management (mindfulness, relaxation exercises) and building resilience and positive coping mechanisms.

Day 4 session 2: This session will cover emotional adjustment and should address fear, anxiety, and depression. Normalising emotional responses to diagnosis and treatment is very critical to adherence**.** Effective communication skills are very important for all healthcare professionals who care for cancer patients. Nurses are to be urged to establish a support system for all cancer patients they encounter and to contact them to ensure the patient is indeed being supported. The issue of body image and self-esteem is also very important and should be discussed. Cancer patients go through a lot, as sometimes they lose body parts to cancer, and sometimes certain body parts swell up and get out of shape. Those with cancer wounds produce a characteristic odour that requires utmost care at all times.

Day 5: to have just one session, for recapping, summary, and assessing learning outcomes, conclusion, and way forward, making recommendations.

7.5.1 Post activity phase (programme evaluation stage)

The programme will be evaluated 4 months after implementation, to give time for all nurses to be trained. The purpose of the evaluation is to ascertain whether the cancer management programme had any impact on the way cancer patients are managed post-training.

7.6 PROGRAMME VALIDATION

To ensure the effectiveness of a health service programme designed to upskill nurses in primary healthcare clinics, a comprehensive validation process is crucial. This involved assessing the program's impact on knowledge, skills, and, ultimately, program outcomes, which are intended to impact positively on cancer clients through quality services at the clinics. The process included both formative (ongoing feedback) and summative (final evaluation) assessments, utilising various methods to gather robust evidence (Liang, Howard, Leggat, & Bartram 2018:120; Ross, Rogers & King 2019:60).

Once the content and PowerPoint slides were developed for the programme according to the teaching plan (Table 7), which was informed by a literature review on the subject

matter. A Programme was forwarded to the team of experts together with survey questions on the programme to establish whether the content and proposed strategies for teaching and activities for learning would equip the nurses with competencies required for the provision of nursing care to cancer patients in primary healthcare clinics (Liang, Howard, Leggat, & Bartram 2018). These were forwarded online (online validation) for three weeks initially (which ended in November 2024 to April 2025) to a team of experts in the area of oncology, senior nurses and nurse managers, community health nurses, and the Ministry of Health representative.

7.6.1 Team of experts involved in the eDelphi process

1. One oncology and palliative care nurse specialist
2. One oncology and palliative care nurse
3. Three senior nurses in charge, each from the study sites
4. Three nurse managers, each from the study sites
5. Three community health nurse specialists, each from a study site
6. A Ministry of Health representative

This was to ensure familiarisation with the cancer service delivery programme and facilitate discussion on it. The programme was validated for relevance to the intended target group, feasibility, acceptability, and comprehensiveness (Bakas, Farran, Austin, Given, Johnson & Williams 2009; Haynes, Richard & Kubany, 1995). To validate the developed programme, the experts had to agree on the feasibility of the content concerning face validity and the provision of periodic assessments to evaluate nurses' knowledge, competency, and ability to apply learned skills in real-world scenarios, and whether it allowed for feedback for participants to share their experiences and suggestions for improvement.

The experts assessed the face value of the content in terms of addressing the intended outcomes. The documents included instructions for the experts to provide comprehensive comments in the provided spaces. The researcher preferred detailed comments, as this would guide her in the extent of change to apply to the programme.

The researcher utilised a Delphi technique, allowing each member to comment on the programme. The researcher initially emailed the programme after receiving an explanation, but they did not respond. Only two responded via email; the rest did not. An appointment was made to meet each face-to-face to discuss their recommendations to improve the programme, and some were always engaged. Responses to the round one programme validation were received, and comments were incorporated. Several recommendations to the programme were made by experts, including the inclusion of the WHO pain ladder and opioid safety; detailed inclusion of cancer staging and its implications; common cancer warning signs and symptoms; and self-monitoring under patient education and psychological support.

The comments on the proposed programme were received from all the experts and incorporated. The researcher addressed the recommendations and sent out version 2 after incorporating the first comments. The programme version 2 came back with minimal comments, like requesting the inclusion of references to show where the content was sourced. It was sent back again, and after the 2nd round of comments were incorporated, it finally came back with no comments for improvement on the 3rd round, but they indicated that the researcher could go ahead with the programme.

7.7 SUMMARY

This chapter describes the Cancer service delivery programme for nurses in primary health care clinics. The programme was designed to equip nurses (non-oncology-trained nurses) in primary health care clinics with basic knowledge and skills required to provide appropriate care to cancer patients. The need for a programme was identified as a gap in Chapter 4 (study findings). The programme was validated for content relevance, comprehensiveness, and feasibility by a team of experts. The next chapter presents conclusions.

CHAPTER 8: CONCLUSION

8.1 INTRODUCTION

Chapter 7 discussed programme development and validation to guide nurses in primary healthcare clinics in the care of cancer patients. This chapter concludes the study by summarising the key research findings in relation to the research aims and research questions, as well as their value and contribution. It also reviews the study's limitations and proposes opportunities for future research.

8.2 OBJECTIVES OF THE STUDY

The study used a convergent parallel mixed-methods design. This design allows for simultaneous qualitative and quantitative data collection, with data analysed separately and the findings of the two approaches weighed equally. Phase 1 addressed the first and second objectives of the study. Objective 3 aligns with Phase 2 of the study, a scoping review of programs for managing cancer in the African context. Lastly, Phase 3, Objective 4, aimed to develop and validate a program to guide non-oncology-trained registered nurses in primary healthcare clinics to provide quality care to cancer patients, as a system-strengthening program serving as an entry point into the cancer care pathway.

8.3 KEY FINDINGS

The qualitative approach explored nurses' perceptions regarding cancer service delivery in primary healthcare clinics. An interview guide was used, and a total of thirty-two participants were interviewed (n = 32) in the three study sites, which were Kanye (n = 12), Molepolole (n = 12) and Ramotswa (n = 8). Five themes that emerged from this phase were: i) Lack of knowledge and skills on cancer management, ii) delays in diagnosis and initiation of treatment, iii) Support to cancer patients, iv) the need for a programme to guide nurses in clinics.

The themes highlighted gaps at the primary healthcare clinics in line with cancer care and were based on participants' perceptions. Literature also indicates that cancer management in low- and middle-income countries faces challenges. These challenges are reported as a lack of resources, both human, equipment, and material, leading to

compromised care provided by non-oncology-trained healthcare workers (nurses and doctors). The lack of appropriate equipment and materials for prompt diagnosis of cancer, and the lack of quality drugs, have also been reported in the literature in low- and middle-income countries compared to developed countries. Hence, a diagnosis of cancer is viewed as a death sentence by cancer patients, because very few cancer patients survive, and this instils fear in patients; they delay coming for results at the clinics.

The quantitative approach in Phase 1 also sought to assess cancer patients' outcomes and quality of life, in line with services provided to them in primary health care clinics. This was done to complement the qualitative approach and gather feedback on the services provided by nurses in primary healthcare clinics. A total of n = 135 patients took part in the study, and the Patient-Reported Outcomes Measurement Information System (PROM) and the EuroQol EQ-5D, used with permission from EuroQol Research Foundation, were used. The questionnaire was divided into three sections: Section A: demographic data; Section B: cognitive, emotional, lifestyle, effects of cancer treatment, and state of health; and Section C: healthcare service characteristics and ratings.

The key findings from this strand are that patients confirmed what nurses asserted: 90% (n = 122) of cancer patients were not satisfied with services from the clinics. The overall rating of health care services was poor, on a scale of 1 to 10 (1 = Extremely poor, 5 = Moderate/average, and 10 = Excellent); the actual rating was between 2.75 and 3.75, indicating poor service. This was consistent with the lack of knowledge and skills reported by nurses in primary healthcare clinics. The lack of health information from the clinic on cancer was reported by 80% (n = 108) of the cancer patients. Health information for communities on cancer and other non-communicable diseases is very important for prevention, recurrence prevention, and promotion of survivorship. This presents a serious challenge in the care of cancer patients.

This is a situation that cannot be ignored; hence the need for a cancer management programme to address it. The results of the study are consistent with the findings of the scoping review. The scoping review proved beneficial; only four studies were identified, even though three had a different focus from the study findings. Three were in

sub-Saharan Africa, one in West Africa, and none in Botswana. One, however, pointed to some similarities with findings of this study, which indicated several factors contributing to poor care for cancer patients, such as healthcare providers' barriers or health system barriers; these included delays in diagnosis of cancer, leading to delays in timely initiation of cancer treatment, emanating from lack of knowledge and skills of nurses and other healthcare providers. Patient factors, including limited health literacy, were also indicated as leading to delays in seeking healthcare, while healthcare workers rely solely on patients to present at primary care clinics, which they do only when they are too sick.

The literature, the researcher's experiences as a community health nurse practitioner, and experts who validated the programme, such as oncology nurse specialists, palliative care nurses, community health nurses, and nurse managers involved in the care of cancer patients, informed the development of the programme to guide cancer care at the clinics. Their input was valuable, as they are very much aware of the state in which patients are discharged from referral hospitals to home care or to continue care at primary healthcare clinics due to a lack of capacity to keep them in the oncology unit until fully recovered.

8.4 IMPLICATIONS OF THE STUDY

The programme was developed and validated by a team of experts involved in the care of cancer patients and knowledgeable about the services provided by nurses in primary healthcare clinics. The experts collectively agreed to the programme, and a Delphi technique was used to validate it, involving the emailing of questions and face-to-face interactions, which ran from November 2024 to April 2025. Their comments helped develop a system-strengthening programme to improve service delivery to cancer patients, aiming to close gaps along the cancer management pathway in Botswana. The programme was developed, validated, and recommended to the Ministry of Health and to primary healthcare clinics.

8.5 LIMITATIONS OF THE STUDY

The study focused only on the southern region of the country because the researcher was self-sponsored and had financial issues. The research only went up to programme

development and validation, not implementation, due to a lack of funding and time, as this was a PhD project as well. It would have been interesting to know the programme's impact. Nurses were reluctant to participate in the study, citing the large volume of patients as the reason, and even when appointments were set outside working times, some cited social engagements, clearly showing that they have very little interest in taking part, but this clearly shows that something must be done to facilitate them to provide better care to cancer patients. The researcher found this worrisome because patient care should be informed by research conducted in the context in which such care is provided.

The use of a non-probability sampling approach and the focus on selected primary healthcare clinics may have introduced sampling bias, thereby limiting the representativeness of the findings. Consequently, the results may not be generalisable to all nurses across different regions or healthcare settings in Botswana or beyond. Secondly, the reliance on self-reported data raises the possibility of response bias, including social desirability bias, where participants may have provided responses perceived as acceptable or favourable rather than reflecting their true experiences or competencies. This is particularly relevant in studies exploring knowledge and skills, where respondents may overestimate their abilities. Furthermore, the cross-sectional design of the study restricts the ability to establish causal relationships or assess changes over time. Methodological constraints such as limited sample size and potential contextual influences within specific clinics may also have affected the depth and transferability of the findings. Despite these limitations, the study provides valuable insights into nurses' perceptions of cancer service delivery within PHC and highlights critical areas for improvement in capacity building and service strengthening.

8.6 RECOMMENDATIONS OF THE STUDY

8.6.1 Nursing Practice

The number of cancer patients is increasing every day, and this requires skilled human resources in oncology. To address this deficit, it is important to build capacity through in-service training of healthcare workers, such as nurses and doctors, working in health facilities without oncology-trained personnel, such as primary healthcare clinics.

The programme developed and validated through this study includes a track for in-service training and also offers guidance on what to do when a nurse, as the first point of contact, encounters a client for the first time, to avoid unnecessary delays in cancer diagnosis.

- There is a need to establish multidisciplinary teams (MDTs) in primary healthcare clinics to streamline care coordination, as seen in gynaecologic oncology, to reduce delays in starting treatment.
- Patients often face significant travel times, which can delay access to care and contribute to late-stage diagnosis. Therefore, establishing multidisciplinary teams in primary healthcare clinics will improve accessibility.
- Primary healthcare clinics should partner with communities, empower them through stakeholder engagement (targeting key influential people like community leaders, pastors, traditional healers, youth, the elderly, the business community, men and women), and mobilise them to form cancer support groups, which play a critical role in assisting cancer patients with needs and promoting cancer survivorship.
- More nurses should be formally trained in oncology, as the programme began at the University of Botswana this semester, in August 2025.
- This is important for primary healthcare clinic nurses to plan and conduct outreach services to educate communities on cancer prevention, predisposing factors, and management. If key stakeholders, such as traditional healers and pastors, understand what cancer is, this will dispel myths and encourage them to advise their clients to seek medical advice on time.
- A diagnosis of cancer impacts patients emotionally. Cancer patients need to be assessed comprehensively as they come for services at the clinic, to know how they are coping and to refer them for counselling.
- Cancer patients' caregivers should also be supported to enable them to offer support to the patients.
- It is necessary to facilitate continuous workshops to empower primary healthcare nurses on cancer management.

8.6.2 Nursing Research

- Conduct a similar study in another similar setting to assess what the results will yield to promote best practice in primary healthcare settings to identify gaps and effective interventions.
- Encourage studies on patient-reported outcomes (PROMs) to better understand cancer patients' experiences and quality of life.
- Promote collaborative research between academic institutions and healthcare facilities to generate locally relevant evidence.
- Develop research on task-shifting strategies to empower nurses in oncology care where specialists are scarce.
- Strengthen capacity for evidence-based practice by training nurses in research methods and data utilisation.

8.6.3 Nursing Management

- Implement in-service training programs to improve oncology knowledge and skills among nurses and inform policy.
- Develop clear protocols and guidelines for cancer care in primary healthcare facilities.
- Ensure adequate staffing and resource allocation to support quality oncology care.
- Promote multidisciplinary teamwork and coordination between different levels of care.
- Encourage supportive supervision and mentorship programs for continuous professional development.

8.6.4 Nursing Education

- Integrate oncology nursing curricula into undergraduate and postgraduate nursing programmes.
- Develop short courses and continuous professional development (CPD) programs focused on cancer care.

- Utilise simulation-based training and case studies to enhance clinical competence in oncology.
- Encourage interprofessional education to foster collaboration among healthcare providers.
- Support distance learning and e-learning platforms to reach nurses in remote and underserved areas.

8.7 CONCLUSION

The study shed light on services rendered to cancer patients in primary healthcare clinics. Patients' rating of quality of services was below their expectations. It is important that nurses in primary healthcare clinics are upskilled regarding cancer patient management aimed at improving quality of services rendered. It is imperative that caregivers of patients are actively involved in all aspects of care, particularly in the context of early hospital discharge, where patients are expected to continue their care at home. The scoping review on programmes for managing adult cancer in the African context could not be found. Hence, there is an urgent need to address this gap.

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ANNEXURE 1: ETHICAL CLEARANCE

UNISA university of south africa

COLLEGE OF HUMAN SCIENCES RESEARCH ETHICS REVIEW COMMITTEE

14 December 2021

Dear Ms Onalenna Tsima

Decision:
Ethics Approval from 14 December 2021 to 14 December 2026

NHREC Registration # :
Rec-240816-052
CREC Reference # :
11383372_CREC_CHS_2021

Researcher(s): Name: Ms Onalenna Tsima
Contact details: 11383372@mylife.unisa.ac.za
Supervisor(s): Name: Prof M. Moleki
Contact details: molekimm@unisa.ac.za

Title: A programme for management of cancer services in Botswana primary health care settings

Degree Purpose: PhD

Thank you for the application for research ethics clearance by the Unisa College of Human Science Ethics Committee. Ethics approval is granted for five years.

The *high risk application was reviewed by* College of Human Sciences Research Ethics Committee, in compliance with the Unisa Policy on Research Ethics and the Standard Operating Procedure on Research Ethics Risk Assessment.

The proposed research may now commence with the provisions that:

1. The researcher(s) will ensure that the research project adheres to the values and principles expressed in the UNISA Policy on Research Ethics.
2. Any adverse circumstance arising in the undertaking of the research project that is relevant to the ethicality of the study should be communicated in writing to the College Ethics Review Committee.
3. The researcher(s) will conduct the study according to the methods and procedures set out in the approved application.
4. Any changes that can affect the study-related risks for the research participants, particularly in terms of assurances made with regards to the protection of participants' privacy and the

Annexure 1 Tsima Certificate ETHICS 202

University of South Africa
Preller Street, Muckleneuk Ridge, City of Tshwane
PO Box 392 UNISA 0003 South Africa
Telephone: +27 12 429 3111 Facsimile: +27 12 429 4150
www.unisa.ac.za

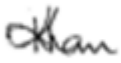
confidentiality of the data, should be reported to the Committee in writing, accompanied by a progress report.

5. The researcher will ensure that the research project adheres to any applicable national legislation, professional codes of conduct, institutional guidelines and scientific standards relevant to the specific field of study. Adherence to the following South African legislation is important, if applicable: Protection of Personal Information Act, no 4 of 2013; Children's act no 38 of 2005 and the National Health Act, no 61 of 2003.
6. Only de-identified research data may be used for secondary research purposes in future on condition that the research objectives are similar to those of the original research. Secondary use of identifiable human research data require additional ethics clearance.
7. No fieldwork activities may continue after the expiry date **(14 December 2026).** Submission of a completed research ethics progress report will constitute an application for renewal of Ethics Research Committee approval.

Note:

*The reference number **11383372_CREC_CHS_2021** should be clearly indicated on all forms of communication with the intended research participants, as well as with the Committee.*

Yours sincerely,

Signature: 

Prof. KB Khan
CHS Research Ethics Committee Chairperson
Email: khankb@unisa.ac.za
Tel: (012) 429 8210

Signature: PP 

Prof K. Masemola
Exécutive Dean: CHS
E-mail: masemk@unisa.ac.za
Tel: (012) 429 2298

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ANNEXURE 2: ETHICAL CLEARANCE BOTSWANA

PROTOCOL TITLE: A PROGRAMME FOR MANAGEMENT OF CANCER SERVICES IN BOTSWANA PRIMARY CARE SETTINGS (CLINICS), HRDC#00972

TELEPHONE: 363 2500
FAX: 317 0155
TELEGRAMS: RABONGAKA
TELEX: 2818 CARE BD

Republic of Botswana

MINISTRY OF HEALTH
PRIVATE BAG 0038
GABORONE

REFERENCE NO: HPRD: 6/14/1 **29th November 2022**

Health Research and Development Division

Notification of IRB Review: **New application**

Onalenna Tsima
P.O Box 4631
Gaborone

Dear Onalenna Tsima,

PROTOCOL TITLE: A PROGRAMME FOR MANAGEMENT OF CANCER SERVICES IN BOTSWANA PRIMARY CARE SETTINGS (CLINICS), HRDC#00972

Review Type: Full board/Health Research and Development Committee
Review Date: 15th September 2022
Approval Date: 15th September 2022
Effective Date: 29th November 2022
Expiration Date: 28th November 2023
Risk Determination: Minimal Risk

Thank you for submitting new application for the above referenced protocol. The permission is granted to conduct the study.

This permit does not however give you authority to collect data from the selected sites without prior approval from the management. Consent from the identified individuals should be obtained where applicable.

The research should be conducted as outlined in the approved proposal. Any changes to the approved proposal must be submitted to the Health Research and Development Division in the Ministry of Health for consideration and approval.

Furthermore, you are requested to submit at least one hardcopy and an electronic copy of the report to the Health Research, Ministry of Health within 3 months of completion of the study. Approval is for academic fulfillment only. Copies should also be submitted to all other relevant authorities.

hhealthresearch@gov.bw botshealthresearch@gmail.com

hhealthresearch@gov.bw botshealthresearch@gmail.com

asebaka@gov.bw
kgmmotlhanka@gov.bw

in research.

Yours Sincerely

Asebaka

for/PERMANENT SECRETARY

MINISTRY OF HEALTH
RESEARCH DIVISION
29 NOV 2022
P/BAG 0038, GABORONE
HEALTH POLICY RESEARCH & DEVELOPMENT

BOTSWANA

ANNEXURE 3: PERMISSION LETTER

TELEPHONE:
5443584/5441257
FAX: 5443934

DISTRICT HEALTH
MANAGEMENT TEAM
PRIVATE BAG MK 13
KANYE

REPUBLIC OF BOTSWANA
MINISTRY OF HEALTH

REF: SKDHMT/6/17/1 I (29)

9th December 2022

Onalenna Tsima
P O Box 4631
Gaborone

Dear Sir/Madam

RE: REQUEST FOR PERMISSION TO CONDUCT THE STUDY

Reference is made to your letter dated 12th December 2022 requesting for permission to conduct the study.

Kindly be informed that your request has been approved for Southern-Kanye.

Your are expected to work closely with the facility management and ensure that clients right are respected. Furthermore you will be expected to submit a report of such study to Southern DHMT.

Thank you.

Yours faithfully

C. Chembe
For/Coordinator DHMT

ANNEXURE 4: PERMISSION LETTER

TELEPHONE: 5908000
FAX: 5915065
TELEGRAM: NGAKA

Republic of Botswana

SCOTTISH LIVINGSTONE HOSPITAL
PRIVATE BAG 001
MOLEPOLOLE

Ref: SLH /6/17/1 VII (15)

14/ 12/ 2022

TO: UNIVERSITY OF BOTSWANA
SCHOOL OF NURSING
BLOCK 244 A ROOM 022

ATT: ONALENNA TSIMA

RE: PERMISSION TO CONDUCT PhD STUDY

We have received a request from you to conduct a PhD study in our facilities. Permission and access is hereby granted to conduct the said study. You are advised to carry out the study in the best professional way possible taking into account the ethical handling of data. You are hereby also requested to share your findings with the staff and management of the facility to enable for future improvements.

I wish you success in your career.

Regards

Dr Collen Maipelo
Chief Medical Officer

ANNEXURE 5: PERMISSION RAMOTSWA

TELEPHONE: 390 5792
FAX: 31 88012
TELEGRAMS: RABONGAKA
TELEX: 2818 CARE BD

DISTRICT HEALTH MANAGEMENT TEAM
PRIVATE BAG RW 004
GREATER GABORONE

REF: GGDHMT 6/17/1 III (17)

Date: 30th January 2023

Onalenna Tsima
P O Box 4631
Gaborone

Dear Madam

RE: REQUEST TO CONDUCT STUDY IN GREATER GABORONE DHMT

This serves to let you know that the proposal submitted for review to Greater Gaborone District Health Management team (GGDHMT) to conduct study entitled: **"A programme for management of cancer services in Botswana Primary care setting (Clinics)."** has been granted approval for the research to be done in the Greater Gaborone District Management Team catchment.

This permits you to go into Greater Gaborone DHMT clinics (**Ramotswa Clinics)** to conduct the study during your recruitment in the facilities ensure that patient care services are not disrupted. The approval is valid for 1 year from the date of this letter. **The HRDC guidelines for continuing reports, amendments and reporting must be adhered to and reports also submitted to the GGDHMT.**

By copy of this letter the Nursing Office in Charge for the Greater Gaborone DMHT clinics, Matron in charge Ramotswa (South East), Facility matrons-Ramotswa clinics and other health workers will be informed of your intentions and asked to provide you access and support during your study. At the commencement of the study please introduce yourself to the facility matrons.

Yours Faithfully

Dr T Ookame
Chairperson Research Ethics Committee-GGDHMT

CC: Chief Health Officer – GGDHMT
Matron in charge – South East
Facility Matrons – South East

MINISTRY OF HEALTH & WELLNESS
GREATER GABORONE RHMT
TEL: [illegible]
31 JAN [illegible]
RECORDS/RMU
PRIVATE BAG RW004
GABORONE

ANNEXURE 6: PERMISSION LETTER

TELEPHONE: 3621400
FAX: 3973776
PLOT NO. 1836
HOSPITAL WAY

REPUBLIC OF BOTSWANA

PRINCESS MARINA HOSPITAL
P. O. BOX 258
GABORONE
BOTSWANA

RE: PMH 2/11AII (74)

18 February 2023

Onalenna Tsima
School of Nursing
University of Botswana
Gaborone

Dear Sir/Madam,

RESEARCH APPROVAL – A PROGRAM FOR MANAGEMENT OF CANCER SERVICES IN BOTSWANA PRIMARY CARE SETTINGS

This letter is to inform you that Princess Marina Hospital Ethics and Research Committee has reviewed and **approved** your above-mentioned protocol. The approval period is from 18 February 2023 – 18 February 2024.

This approval is subject to compliance with the following requirements:

1. All changes of amendments, deviations, violations of your protocol are to be submitted for review again and approval by Princess Marina Hospital Ethics and Research Committee before implementation.
2. Only approved documents like informed consents, questionnaires and materials submitted with the protocol will be used.
3. Researcher must not change any aspect of the research without permission from the Princess Marina Hospital Institutional Research Board.
4. Any unforeseen circumstances including termination of the study must be reported to Princess Marina Hospital Research Board immediately.
5. The Princess Marina Hospital Research Board must have access to the on-going study anytime for auditing purposes.
6. After completion of the study, the researcher must submit a hard copy and soft copy of protocol/study report to Princess Marina Hospital Ethics and Research Board.

Wish you prodigious triumph in your study.

Yours faithfully

S.B Mthunzi-Sekano
Secretary PMH REC
For Hospital Superintendent

ANNEXURE 7: QUESTIONNAIRE

Annexa 1: QUESTIONNAIRE FOR CANCER PATIENTS AGED 21 YEARS & ABOVE

Programme for Management of Cancer services in Botswana primary health care settings (clinics)

Dear Respondent,

I am a Ph.D. student exploring health care services provided to cancer patients and the results obtained maybe programme that will improve cancer service delivery in primary health care settings. Your honest response to the questions will be highly appreciated. Your personal information is for the purpose of comparing the results and it traced back to you because no names will be attached to it. Your participation is voluntary, and you do not have questions if you don't feel like answering.

Participant's Code:	
Facility Code:	
Interviewer Code:	
Date of Interview (DD/MO/YEAR):	

Section A: Demographic data

Age (In years)	Gender	Level of Education	Occupation	Religion
21 – 25 ◻	Female ◻	Primary ◻		Christian ◻
26 – 30 ◻	Male ◻	Secondary ◻		Islam ◻
31 – 35 ◻	Non-binary ◻	Tertiary ◻		Other ◻

36 – 40 □				
41 – 45 □				
46 – 50 □				
51 – 55 □				
56 – 60 □				
61 – 65 □				
65 + □				

Section B

#	Items	Strongly Disagree	Disagree	Uncertain	Agree
	Cognitive and Emotional Aspect				
1.	I had information about cancer from the local clinic before I had the condition				
2.	I had information about cancer from elsewhere other the local clinic				
2.	I belief there are other traditional causes of this condition other than biomedical explanations.				
3.	I am always concerned about my condition				
4.	I am always feeling sad and worried				
5	This condition makes me anxious and stressed most of the time				
6.	I have accepted my condition				
7.	I have learned to cope and leave with it				
8.	I have the motivation to overcome this condition				
	Lifestyle factors				
9.	I continuously get information about the importance of diet and exercises from local clinic				
10.	I know the type of food I must eat				

36 – 40 □				
41 – 45 □				
46 – 50 □				
51 – 55 □				
56 – 60 □				
61 – 65 □				
65 + □				

Section B

#	Items	Strongly Disagree	Disagree	Uncertain	Agree
	Cognitive and Emotional Aspect				
1.	I had information about cancer from the local clinic before I had the condition				
2.	I had information about cancer from elsewhere other the local clinic				
2.	I belief there are other traditional causes of this condition other than biomedical explanations.				
3.	I am always concerned about my condition				
4.	I am always feeling sad and worried				
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6.	I have accepted my condition				
7.	I have learned to cope and leave with it				
8.	I have the motivation to overcome this condition				
	Lifestyle factors				
9.	I continuously get information about the importance of diet and exercises from local clinic				
10.	I know the type of food I must eat				

	The following remained the same, improved a little, got better or resolved completely while receiving servi clinic:								
		1	2	3	4	5	6	7	8
27.	Feelings of fear and worry because of the condition								
28.	Inability to take care for self because of frailty from the condition								
29.	Discomfort from side effects of chemotherapy								
30.	Receiving information continuously on cancer prevention, early detection, and management								
31.	Ongoing psychosocial support								
32.	Pain management								
33.	Wound care								
34.	Loss of weight								

THE END: THANK YOU!!

ANNEXURE 8: SETSWANA TRANSLATION

Annexa 1: Dipotso ka Setswana–Balwetse ba kankere(dingwaga tse 21 le

Setlhogo sa ditshekatsheko: Lenaneo la go kaela tlhokomelo ya balwetse b

Go Motsaakarolo,

Leina lame Onalenna Tsima ke moithuti wa dithuto tsa Ph.D, ko University of Sc sireletsegile, dipotso tse di tlhatlhobilwe, ka bo ka fiwa tetla ke ba ofisi ya dipatlisi Ministry of Health & Wellness Health Research and Development Committee, le Hospital, gore ke lobotsolotse ke tlhotlhomisa ka fa ditirelo tsa botsogo tse di fiwa thusiwang ka teng, gore a di aba fitlhelela, ka fa ba ditlhokang ka teng, mme ba f tsa gago di a go thusa go tokafatsa ka fa balwetse ba kankere ba fiwang ditlame ke ka leboga thata fa o ka fa dikarabo ka fa wena oitseng ka teng. Dipotso tse di maduo a tle a tshwantshanngwe, mme ga go na go diriwa maina, gape dikarabo gope. Ke ga telela gore go tsaa karolo gagago mo dipatlisisong tse ga go patelec tsela epe.

Motsaakarolo code:	
Facility Code:	
Mosekaseki Code:	
Letsatsi (DD/MO/YEAR):	

Karolo ya ntlha (Section A): Ka ga Motsaa karolo

Dingwaga	Bong	Dithutego	Pereko
21 – 25 □	Mosadi □	Tse dipotlana □	
26 – 30 □	Monna □	Tse dikgolwane □	
31 – 35 □		Tsa ithutelo Tiro □	
36 – 40 □			
41 – 45 □			
46 – 50 □			
51 – 55 □			
56 – 60 □			
61 – 65 □			
65 + □			

Karolo ya bobedi (Section B)

#	Dintlha tsa go botswa	Strongly Disagree	Disagree
	Ka goitse ka bolwetse jwa kankere le maikutlo ka jone.		
1.	Ke rutilwe ka bolwetse ja kankere mo kokelwaneng pele ga botshwarwa mo go nna		
2.	Kena le tumelo ya gore kankere e ka tswa e bakiwa ke dilo dingwe tse di amanang le setso		
3.	Ke nna ke tshwenyegile ka botsogo ja me		
4.	Ke nna ke utlwile botlhoko ke botsogo jame		
5	Ke nna hela ka maikutlo aa tshwenyegileng/stress		
6.	Ke amogetse seemo sa botsogo jame		
7.	Ke ikamogetse		
8.	Kena le tsholofelo ya go fenya bolwetse jo		
	Mokgwa wa botshelo wa tsatsi le letsatsi		

9.	Ke nna ke hiwa dithuto ka botlhokwa jwa go ja sentle le go itshidila mmele ko kokelwaneng		
10.	Ke itse gore ke tshwanetse go ja jang		
11.	Ke itshidila mmele kgapetsakgapetsa		
12.	Ga ke kgone goitirela tse ke ditlhokang ka lebaka la bolwetse		
	Kalafi e ke tsaayang		
13.	Ditlamorago tsa dkalafi di ama botsogo jame		
14.	Ke nna ke amogela thuso le thotlhoetso ko kokelwaneng fa ke gatelelwa ke ditla morago tsa kalafi		
	Ke kgotsofalela thotloetso e ke fiwang ke ba ba latelang		
15.	Ba lwapa lame		
16.	Masika le ditsala		
17.	Ditlhopha tsa thotloetso tsa Motse (Support groups)		
18.	Baoki ko kokelwana		
19.	Dingaka ko kokelwaneng		
20.	Baboipelego (Social workers)		
21.	Ke tlhakana le batho hela jaaka gale ga goa harologana sepe/chencha		
	Ditirelo tsa botsogo		
22.	Ke kgotsofalela ka fa ke thusiwang ka teng ka tsa botsogo ke ba kokelwana		
23.	Ke bona thuso mo go ba kokelwana le fa kee tloka ko lwapeng		
24.	Ke bona tsa tshidilo maikutlo nako le nako		
25.	Ke fiwa dithuto tsa bolwetse ja kankere tsa thibelo go boelela le go tokafatsa botsogo		
26.	Ga nke ke tlolwa ke nako ya go bona ngaka ko oncology clinic.		

	Karolo ya boraro (section c)				
	Fa sekale mo go tse dilatelang ka ditlamelo tse o difiwang ko koke **Sekale: 1-4 = boleng jo ko tlase thata, 5-6 = boleng ja ditlamelo bo thata**				
	Tse di latelang di ne tsa seka tsa tokafala, tsa tokafala go le gonnye, tsa toka ditlamelo tsa botsogo mo kokelwaneng				
28.	Maikutlo a letshogo le go akanya thata ka bolwetse	**1**	**2**	**3**	**4**
29.	Go latlhegelwa ke go itlhokomela ka mabaka a go koafala ga mmele ke bolwetse				
30.	Mmele o o tlhakatlhakaneng ke ditlamorago tsa kalafi ya kankere				
31.	Go sa fiweng thuto ka tsa bolwetse ja kankere mogo tsa thibelo, go lemoga bolwetse ka nako le tlhokomelo (prevention, early detection and management)				
32.	Go sa sidilwa maikutlo a gogomusiwa ke bolwetse le mathata a botshelo a bakilweng ke go lwala				
33.	Ditlhabi				
34.	Go tlhokomelwa ga dintho				
35.	Go latlhegelwa ke mmele.				

Bokhutlo : Ke a leboga fela thata.

ANNEXURE 9: INTERVIEW GUIDE FOR NURSES

Title: Perceptions of Nurses regarding cancer service delivery in Primary Healthcare clinics

Interviewer Code: _____

Participant's ID: _____

Date of Interview (dd/mm/yy)____/_____/_____

Participants.

I am Onalenna Tsima a PhD student exploring health care services provided to cancer patients in primary care clinics. This information will hopefully be used to develop a programme that will improve cancer service delivery in primary care clinics. Your honest response to the following questions will be highly appreciated. Your personal information like age and gender is for the purpose of comparing the results and it can never be traced back to You because no names will be attached to it. Your participation is voluntary, and You do not have to respond to questions if You don't feel like answering.

You have been providing health care services to cancer patients in Your clinics, please share Your views regarding the services You provide. You are requested to respond to the following questions freely and honesty.

1. What do You understand by cancer service delivery?
2. How do You perceive health care services provided to cancer patients in Your clinic?
3. How is cancer service delivery coordinated, explain the different cancer care pathways and how they are linked.

4. How much did Your training equip You with skills to provide care to cancer patients?
5. What support services to do You provide to cancer patients?
6. How often do nurses check on cancer patients while on home care/palliative care? explain
7. What challenges do You experience when providing care to cancer clients on home care?
8. How do You empower the community with messages geared towards prevention of NCDs? Specifically cancer?
9. What are Your views about a programme that guides cancer service delivery in primary care settings?
    -
    - End of interview!!

ANNEXURE 10: SETSWANA CANCER PATIENT

UNIVERSITY OF SOUTH AFRICA

SCHOOL OF POST GRADUATE STUDIES

DEPARTMENT OF HEALTH SCIENCES

CONSENT TO PARTICIPATE IN THE STUDY

Ethics clearance reference number:

Research permission reference number (if applicable):

PI Version date: 23rd November 2021

Basekaseki bagolo: Onalenna Tsima & Professor Mary Moleki

Aterese: University of Botswana (UB)
Faculty of Health Sciences, School of Nursing
Private Bag 0079
Gaborone, Botswana
Email address: tsimao@ub.ac.bw

Setlhogo sa ditshekatsheko: Lenaneo la go kaela tlhokomelo ya balwetse ba kankere mo dikokelwaneng.

DINTLHA TSA BOTLHOKWA

- Re go kopa go ithaopa go tsenelela tshekatsheko. Tshekatsheko e, e leka go batlisisa ka fa ditirelo tsa botsogo tse di fiwang balwetse ba kankere ka teng kwa dikokelwaneng, gore a di aba fitlhelela, ka fa ba ditlhokang ka teng, mme ba felele ba thusiwa mo ba kgotsofalang.

- O kopiwa go ithaopa go tsaya karolo ka gore o setse o kile wa kopa thuso ya ditirelo kana o ntse o tsweletse o a ya go thusiwa ko kokelwaneng e gaufi le wena, jaanong re tlaa go kopa go araba dipotso tse dimabapi le ditirelo tse o di tsayang, kana tse o kileng wa ditsaa mabapi le bokowa jo onang najo, dikarabo tsa gago di ka thusa go tokafatsa tlhokomelo e ehaphegileng ya balwetse ba kankere mo dikokelwaneng
- Go tsenelela dipatlisiso tse ga go patelediwe, ke goitlhophela gagago, ga go patelediwe. Ka jalo o ka botsa dipotso go go thusa go tlhaloganya le go tsaa tshwetso. Re go kopa gore o tlhaloganye Sengwe le Sengwe se se mo foromomg e pele o tsaa tshwetso.
- Go tsenelela dipatlisiso tse ga go kake ga ama tlhokomelo e o e bonang ko kokelwaneng kana go pe hela mo lephateng la botsogo.
- Ha o tsenelela patlisiso e potsolotso ya go tsaya metsotso e e 45-50.
- Re kopa tiriso ya go gatisa manswe go re re tsee dintlha ka tlhamalalo.
- Dikarabo tsa gago ga di kake tsa amangwa le wena, ka gore ga re dirise maina , go araba ga gago go sephire, go a go tshwarwa ka fa go haphegileng. Ga gona ope ko ntleng ya mmatlisisi mogolo, yo o ka nnang le kamano le dikarabo tse o tlaabong o dirifile kana le tse digatisitsweng. Dikarabo tsa gago dia go bewa sentle mo sebala makgolong se se sa dirisiweng ke mongwe le mongwe. Tse di gatisitsweng tsone dia go bewa mo kobotong e e mo phposing ya mmatlisisimogolo e lotlelwang nako tsotlhe, mmatlisisimogolo ke ena a tsholang senotlholo.
- Re solofela gore dikarabo tsa gago le babangwe di tlaa thusa go tokafatsa ditirelo tsa balwetse ba kankere kwa dikokelwaneng.
- Go tsenelela dipatlisiso tse ga go na go nna le maduo a golebaganeng gone jaana, jaaka ke buile go ka thusa go tla ka kaelo lenaneo la tokafatso dithuso tse di fiwang balwetse mo dikokelwaneng.
- Fa dipotso dingwe di ka se go tsee sentle ka tsela nngwe hela mo maikutlong, ok anna o seke o diarabe, kana waikhutsanyana, kana wa supa go batla go sa tswelele le dipotsolotso nako nngwe le nngwe fela.

MOSOLA WA PATLISISO E KENG?

Patlisiso e go solofela gore:

E ka tla ka dintlha tse dika thusang go dirwa ga Lenaneo la go kaela tlhokomelo ya balwetse ba kankere mo dikokelwaneng le go dumelwang le ka tokahatsa tlhokomelo ya bolwetse tsa kankere, ka jalo go nne le maduo a itumedisang a balwetse, gongwe le a malwetse a mangwe a a sa tshelanweng.

KE ENG KE KOPIWA GO TSENELELA PATLISISO E?

- O kopiwa go tsenelela patlisiso e ka gore o ka nna wa tswa o kile kopa thuso kana o ntse o tsweletse o e kopa ko kokelwaneng e e gaufi le wena ka jalo re go kopa go araba dipotso tse di itebagantSeng le dithuso tse, ha ele gore o ikutlwa o kgona ebile ona le keletso go ka araba, e ke tsela nngwe ya go thusa tokafatso ya ditirelo bogolo jang tsa bolwetse ja kankere mo dikokelwaneg.
    -
- Re tlaa go kopa go tsenelela potsolotso e e tla tsayang sebaka sa metsotso ele 45-50. Dipotso ditlaabo di amana le botsogo ja gago le go kopa thuso ya ditlamelo ko kokelwaneng. Dipotso di tlaabo di remeletse mo go kgoneng ga gago, tsa botshelo ja tsatsi le letsatsi, tsa kalafi, le go sapotiwa ka kakaretso.
- Puisanyo e tlaa nnela fa go haphegileng, le ka letsatsi le o tlileng go bona ngaka ko oncology clinic, e ka nna ya direga oise o tsene mo ngakeng kana fao tswa, fa o na le nako.
- E le ntlha nngwe ya patlisiso e , re kopa go gatisa buisanyo, se se tlaa netefatsa gore re tsaa dintlha ka tlhamalalo, mme o ka kopa gore re emisa kgatiso nako nngwe le nngwe.
    -

GO TSENELA PATLISISO GA ME KE MO GONTSENG JANG?

- Re tlaa bo re solofela gore o rabe dipotso tse di tlaabong di itebantse le botsogo ja gago tsa goitekodisa le di tlamelo tse o ditlhokang ko kokelwaneng kana tse odi fiwang ko kokelwaneng.
- Dipotsolotso di tlaabo di kgaogantswe gararo, karolo ya ntlha ke go goitse, mme re sa kwale leina la gago, karolo ya bobedi, ke tsa botsogo: maikutlo, tsa botshelo ja tsatsi le letsatsi, tsa sapote, tsa kalafi, le tsa ditlamelo ko kokelwaneng.

- Jaaka re tlhalositse dipuisanyo di tlaa tsaa metsotso e 45 – 50.

A NKA KOPA GO SA TSWELELE LE PATLISISO LE FA KE DUMETSE KO TSHIMOLOGONG?

- Go tsenelela patlisiso ke boithaopo, ga o tlamiwe ke sepe to dumela go tsenelela.
- Fa o tsaa tshwetso go tsenelela o tlaa fiwa mokwalo o ne o gore o ipeele, o bo o kopiwa go saena e le se supo sa gore o dumetse go tsenelela ka boithaopo.
- You are free to withdraw at any time and without giving a reason and You will not be penalised nor victimized for doing so.
- Di emela maina (Codes) ditlaa dirisiwa boemong ja maina, se se tlaa netefatsa gore dikarabo tsa gago ga di kake tsa tshwaragangwa le wena kana ope fela yoo tlaa tsayang karolo, le goikgethela go tswa go ntse go tsweletswe o ka go dira ka nako nngwe le nngwe.

TSHOLOFELO YA BOMOSOLA WA GO TSENELELA PATLISISO E MO GO NNA KE ENG?

Go tsenelela patlisiso e go ka tswa go sena maduo a a golebaganyeng mo bo gompienong , mme dikarabo tsa gago le go arogana le rona dikarabo tsa gago go ka thusa babangwe mo nakong e e tlang ka go thusa go tla ka lenaneo la go kaela tlhokomelo ya balwetse ba kankere mo dikokelwaneng, lenaneo le le ka thusa go tokafatsa ditlamelo le tlhokomelo ya balwetse ba kankere, ka jalo gotofatse go bo go ba fe natla go lwantsha bolwetse, gongwe le ba lephata la botshogo ba ka tsaa ditshwetso tsa tokafatso ba labile maduo a dipatlisiso.

A GO NA LE DITLA MORAGO TSE DI DIPHATSA HA NKA TSAA KAROLO MO PATLISISONG e?

Dipuisanyo ga dina go dirwa nako ya fa o thosiwa mogofaphegileng(procedure) kana go ne hela hoo o fetsa go thusiwa. Puisanyo e tlaa dirwa ha o bona go go siametse Ba ba ka nnang le maikutlo aa kukegang, tomagano le mogolwane wa kokelo e tlaa dirwa go re bo ne tshidilo maikutlo.

A PUISANYO YAME LE MMATLISISI E TLAA TSHWARWA KA TSHIRELETSEGO?

Jaaka re tlhalositse tshireletsego ya puisanyo le dikarabo tseo di refileng di tlaa tshwarwa ka mokgwa o latelang:

- Dikarabo tsa gago ga rena go difa leina, re tlaa dirisa nomore/kana seemela leina ka nako tsotlhe.
- Ka jalo mmatlisisi mogolo, le moitsaanape wa statistics le (motlhatlhelela mmatlisisi mogolo, fela fa go tlhokega), ke bone batlaa nnang le kamano le dirakabo tsa lona. Kajalo bobedi bo tlaa tlhokega go saena tumalano ya go tshegetsa sephirir.
- Dikarabo tsa gago di ka lebelelwa ke baitsaanape ba ba kgethilweng go diragatsa gore patlisiso e e dirwa ka mo go tshwanetSeng, jaaka moitsaanape wa statistics, bangwe ba Research Ethics Review Committee, le fa gontse jalo ga go na sepe se ka amanyang le karabo tsa gago.
- Go patlaladiwa ga maduo a patlisiso a sena go sekasekiwa jaaka go publisher, le go presenta mo conferences ga go na go amamgwa le wena ka tsela epe.

BABATLISISI BA YA GO SIRELETSA DIKARABO TSA RONA JANG?

Dikarabo tsa gago le tsa babangwe dia go tsenngwa di bo di bewa mo sebalamakgolong se se sa kgonegaleng go dirisiwa ke mongwe le mongwe ka se bulwa ka fa gohaphegileng. Tiriso ya maduo a a bolokilweng go ya pele e ka kanokiwa gape ke ba komiti ya Research Ethics Review ha go tlhokega.

Dikarabo tse di kwaletsweng mo dipampiring di tlaa bewa mo sebolokelong se se lotlelwang mo phaposing ya mmatlitlisi mogolo mo 244 A/22, School of Nursing go fitlha nako ya ngwaga tse tlhano, go ne kwa mmatlisisi mogolo a berekang teng mo University of Botswana.

Dimpampiri tse di nang le dikarabo le sebeelo sa sebalamakgolo ditlaa Sengwaa fa disa tlhole di tlhokega.

A KE TLAA FIWA TUELO KANA PHIMOLO DIKELEDI YA GO TSENELELA PATLISISO E?

Ga go na go nna le tuelo, le ha ele ditatlhegelo dibe mo go lona, ka gore potsolotso ya go nna ko Oncology clinic nako e le tlaabong le tlile go bona babo ngaka. Mmatlisisi o tlaa le kopa nakonyana e e metso e 45-50 go le botsolotsa ha le dumalane. Mo tokafatsong ditlamelo kana ditirelo tse le difiwang ko dikokelwaneng, go maleba gore

le nne bontlha nngwe ja go ntsha megopolo gore ditirelo di ka tofadiwa jang, sone se patlisiso e, e lekang go se dira.

A TSHEKATSHEKO E FILWE TETLA KE MAKGOTLA A TSAMAISO YA MAPHATA A DIPATLISISO

Tshekatsheko e e kanokilwe ke Makgotla a Tsamaiso ya Maphatla a dipatlisiso, a a kanokang dithuto tsa ditshatsheko tsa batho. Makgotla a a ka go thusa fa o na le dipotso, matshwenyego kgotsa dingongora patlisiso/ tshekatsheko e. Fa go tlhokafala o ka ikgolaganya le Lekgotla la Tsamaiso ya Dipatlisiso la University of Botswana; University of Botswana IRB, Phone: +267 355-2900, E-mail: research@mopipi.ub.bw, Telefax: +267 395-7573; or the Princess Marina Hospital Research & Ethics Committee, Phone: +267362278, Telefax: +267 3973776.

KE A GOITSISIWE JANG KA MADUO A TSHEKATSHEKO E?

Maduo a tshekatseko e a phatladiwa mo dikokelwaneng, Lephata la Botsogo le mo dikgobokanong tsa dipatlisiso(conferences) le go gasa ka mekwalo ya diptlisiso e e faphegileng(scientific publications). Maduo a tshekatsheko a tla lebaka la ngwaga tse lesome (10 years).

HA O NA LE DIPOTSO KA TSHEKATSHEKO E, OKA TSHWARA BA BA LATELANG.

Mosekaseki mogolo: Onalenna Tsima on +26772245603/ 3552357 or onnietsima@gmail.com.

Fa o sa kgone go tshwara Mosekaseki mogolo mme o tlhokana le go bua le mongwe, o ka leletsa; University of Botswana IRB (+267 355-2900).

GO BAA SAKANO MO MOKWALONG O GO RAYA ENG?

Go saena fa, go raya gore o badile se se kwaleng fa sotlhe, o nnile le nako ya botsa dipotso, jaanong o dumalana to tsenelela tshekatsheko e. Go saena tumalano, ga go ree gore ditshwanelo tsa gago di tlaa gatakiwa.

RE TLAA GO FA MORITI WA FOROMO E.

_____ _____ _____

Sekano sa Motsaakarolo (Kwala leina) Letsatsi/nako

_____

Sekano sa Mosekaseki mogolo (Kwala leina) Letsatsi/ nako

_____

Sekano (Mosupi) (Kwala leina) Leina/nako

ANNEXURE 11: CONSENT FORM FOR NURSES

UNISA university of south africa

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APPENDIX 5 ¶

UNIVERSITY OF SOUTH AFRICA SCHOOL OF GRADUATE STUDIES ¶

DEPARTMENT OF HEALTH SCIENCES ¶

CONSENT TO PARTICIPATE IN THE STUDY (nurses) ¶

Ethics clearance reference number: ¶

Research permission reference number (if applicable): ¶

PI Version date: 23rd November, 2021 ¶

Study Title: Programme for management of cancer services in Botswana primary care ¶

settings ¶

Dear Prospective Participant ¶

Student research project ¶

My name is Onalenna Tsima and I am doing research with Professor Mary Moleki, in Department of Health Studies, Collage of Human Science, towards a doctoral degree (Ph.D. Nursing) at the University of South Africa. ¶

- We are inviting you to participate in a study entitled; "***Programme for management of cancer services in Botswana primary care settings***" ¶
- Your participation in this study is voluntary. ¶
- You are being asked to join this study because you are a nurse in primary care settings either in Ramotswa, Molepolole, & Kanye and you provide nursing care to cancer patients ¶
- It is your choice to join the study. You can ask as many questions as you need to help you make your decision. Please review everything in this form before you decide. ¶
- Your participation in this study will not lead to any victimization or affect your job in anyway. ¶
- If you join, we will ask you to take part in an interview that will take up to 45- 50 minutes of your time. ¶
- In order for us to not miss any information, the interview will be audio recorded. ¶
- Any information that you provide will not be identifiable, it will be confidential – your answers will not be connected to your name. No one other than the researcher will have access to either information collected or the audio recordings. The information will be entered into a password protected computer and the audio recorders will be kept in a

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PO Box 392 UNISA 0003 South Africa
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www.unisa.ac.za

lockable cabinet in the researcher office and no one other than the researcher accesses this cabinet.¶

- We hope that the information that you and others share with us will help us improve cancer service delivery in primary care settings. There are no direct benefits to you from being part of this study, but it is hoped that the findings may inform a programme that will guide comprehensive nursing care to cancer patients in clinics.¶
- If some questions may make you feel uneasy, you are free to refuse to answer them take a break, or stop taking part in this study at any time.¶

¶

WHAT IS THE PURPOSE OF THE STUDY?¶

This study is expected to:¶

- inform the development of a programme that could guide and improve cancer service delivery for adults aged 21years and above in primary care settings, and this could lead to better client outcomes and improved health care services to cancer clients and maybe even for other chronic conditions.¶

WHY AM I BEING INVITED TO PARTICIPATE? ¶

- You are being invited to join this study because you are a nurse in clinics and providing nursing care to cancer clients among others and we would ask you to respond to a set of statements related to services you provide to cancer patients, if you are willing to share, this is one way of reflecting on service delivery and in particular cancer service delivery in the clinics.¶
- You will participate in an interview that will last up to 45-50 minutes. We will ask you to respond questions that open ended followed by probes and would request you to explain the best way you can regarding services provided to cancer patients at your clinic. The interview will take place in private location in the clinic and on a day and time convenient to you.¶
- As part of this study, we would like to audio record what we discuss to make sure that we have captured your answers correctly. You may ask us to stop audio recording at any time.¶

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WHAT IS THE NATURE OF MY PARTICIPATION IN THIS STUDY?

Describe the participant's actual role in the study.

- → Participants are expected to respond to an interview guide to explore your perceptions regarding cancer services in your clinics.
- → The interview guide is in two parts, section A is the demographic variables and section B are open ended questions on cancer service delivery in your clinics.
- → The interview is expected to take 45-50 minutes.

CAN I WITHDRAW FROM THIS STUDY EVEN AFTER HAVING AGREED TO PARTICIPATE?

- → If you do decide to take part, you will be given this information sheet to keep and be asked to sign as evidence that you are taking part in this study voluntarily.
- → You are free to withdraw at any time and without giving a reason and you will not be penalised nor victimized for doing so.
- → Codes will be used instead of names so information collected cannot be traced back to any participant, and the decision to withdraw can be taken at any stage and at any time.

WHAT ARE THE POTENTIAL BENEFITS OF TAKING PART IN THIS STUDY?

Although there may not be any direct benefit for taking part in the study, however, the information you share may help improve service delivery for cancer patients, as it may inform development of a programme that will guide cancer services in primary care settings, and this will help improve the quality of services, promote better client outcomes, inform policy, and may promote cancer survivorship.

ARE THERE ANY NEGATIVE CONSEQUENCES FOR ME IF I PARTICIPATE IN THE RESEARCH PROJECT?

None, this will not interfere with your work schedules, you choose time most convenient for you.

WILL THE INFORMATION THAT I CONVEY TO THE RESEARCHER AND MY IDENTITY BE KEPT CONFIDENTIAL?

As already explained, confidentiality will be maintained through the following:

- → Your responses will be given a code number and will be captured and referred to in this way in the data, any publications, or other research reporting methods.
- → Only the researcher, the supervisor, and the co-coder will have access to the data. These individuals will be required to sign a confidentiality agreement.
- → Your answers may be reviewed by people responsible for making sure that research is done properly, such as the researcher, and members of the Research Ethics Review Committee, however the data can never be in any way be traced back to you.

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The participants will also be informed that data collected will be solely for the purpose of the study, and there will be no identifier's that can link them to the data. Any publications and reports arising from the study or sharing of study findings during conferences will not be linked to them in anyway.

HOW WILL THE RESEARCHER(S) PROTECT THE SECURITY OF DATA?

Electronic information will be stored in a password protected computer. Future use of the stored data will be subject to further Research Ethics Review and approval if applicable.

Hard copies of your answers will be stored by the researcher for a minimum period of five years in a locked cupboard/filing cabinet in the researcher's office in block 244 A/office 022 School of Nursing University of Botswana, where the researcher is currently employed as a lecturer.

Hard copies will be shredded and/or electronic copies will be permanently deleted from the hard drive of the computer when no longer needed.

WILL I RECEIVE PAYMENT OR ANY INCENTIVES FOR PARTICIPATING IN THIS STUDY?

There will be no payment or any incentives because participants will not bear any costs, which may warrant compensation or payment, because they will be interviewed at their workplace at a time convenient for the, which does not interfere with their work schedules.

HAS THE STUDY RECEIVED ETHICS APPROVAL

This study has been reviewed by an Institutional Review Board/s (IRBs), a group of people that reviews research. The IRB can help you if you have questions, concerns, or complaints about this research study.° If needed, you may contact the University of Botswana IRB, Phone: +267 355-2900, E-mail: research@mopipi.ub.bw, Telefax: +267 395-7573; or the Princess Marina Hospital Research & Ethics Committee, Phone: +267362278, Telefax: +267 3973776.

HOW WILL I BE INFORMED OF THE FINDINGS/RESULTS OF THE RESEARCH?

The findings will be shared with health facilities, ministry of health and during conferences and scientific publications. The findings are accessible for 10 years.

WHAT SHOULD YOU DO IF YOU HAVE QUESTIONS ABOUT THE STUDY?

Should you require any further information or want to contact the researcher about any aspect of this study; contact: Onalenna Tsima on +26772245603/ 3552357 or onnietsima@gmail.com. If you cannot reach the investigator or wish to talk to someone else, call the University of Botswana IRB (+267 355-2900).

WHAT DOES YOUR SIGNATURE ON THIS CONSENT FORM MEAN?

By signing this form, it means that you have read the information in this form, you have had a chance to ask questions, and you agree to join the study. You are not giving up any rights by signing this consent form.

WE WILL GIVE YOU A COPY OF THIS FORM

_____

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Signature of Participant → → → → (Print Name) → → → → Date/Time

Signature of Person Obtaining Consent → → (Print Name) → → → → Date/Time

Signature (Witness) → → ..... (Print Name) → → → → Date/Time

UNISA university of south africa

¶

APPENDIX 5¶

UNIVERSITY OF SOUTH AFRICA SCHOOL OF GRADUATE STUDIES¶

DEPARTMENT OF HEALTH SCIENCES¶

CONSENT TO PARTICIPATE IN THE STUDY (nurses)¶

Ethics clearance reference number: ¶

Research permission reference number (if applicable): ¶

PI Version date: 23rd November, 2021 ¶

Study Title: Programme for management of cancer services in Botswana primary care¶

settings ¶

Dear Prospective Participant ¶

Student research project ¶

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- We are inviting you to participate in a study entitled; "***Programme for management of cancer services in Botswana primary care settings***"¶
- Your participation in this study is voluntary. ¶
- You are being asked to join this study because you are a nurse in primary care settings either in Ramotswa, Molepolole, & Kanye and you provide nursing care to cancer patients¶
- It is your choice to join the study. You can ask as many questions as you need to help you make your decision. Please review everything in this form before you decide.¶
- Your participation in this study will not lead to any victimization or affect your job in anyway.¶
- If you join, we will ask you to take part in an interview that will take up to 45- 50 minutes of your time. ¶
- In order for us to not miss any information, the interview will be audio recorded.¶
- Any information that you provide will not be identifiable, it will be confidential – your answers will not be connected to your name. No one other than the researcher will have access to either information collected or the audio recordings. The information will be entered into a password protected computer and the audio recorders will be kept in a

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lockable·cabinet·in·the·researcher·office·and·no·one·other·than·the·researcher·accesses·this·cabinet.·¶

- → We·hope·that·the·information·that·you·and·others·share·with·us·will·help·us·improve·cancer·service·delivery·in·primary·care·settings.··There·are·no·direct·benefits·to·you·from·being·part·of·this·study,·but·it·is·hoped·that·the·findings·may·inform·a·programme·that·will·guide·comprehensive·nursing·care·to·cancer·patients·in·clinics.··¶
- → If·some·questions·may·make·you·feel·uneasy,·you·are·free·to·refuse·to·answer·them·take·a·break,·or·stop·taking·part·in·this·study·at·any·time.¶

¶

WHAT·IS·THE·PURPOSE·OF·THE·STUDY?·¶

This·study·is·expected·to:¶

- → inform·the·development·of·a·programme·that·could·guide·and·improve·cancer·service·delivery·for·adults·aged·21years·and·above·in·primary·care·settings,·and·this·could·lead·to·better·client·outcomes·and·improved·health·care·services·to·cancer·clients·and·maybe·even·for·other·chronic·conditions.¶

WHY·AM·I·BEING·INVITED·TO·PARTICIPATE?·→ ¶

- → You·are·being·invited·to·join·this·study·because·you·are·a·nurse·in·clinics·and·providing··nursing·care·to·cancer·clients·among·others·and·we·would·ask·you·to·respond·to·a·set·of·statements·related·to·services·you·provide·to·cancer·patients,·if·you·are·willing·to·share,·this·is·one·way·of·reflecting·on·service·delivery·and·in·particular·cancer·service·delivery·in·the·clinics.¶
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- → As·part·of·this·study,·we·would·like·to·audio·record·what·we·discuss·to·make·sure·that·we·have·captured·your·answers·correctly.·You·may·ask·us·to·stop·audio·recording·at·any·time.¶

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ANNEXURE 12: LANGUAGE AND TECHNICAL EDITING CERTIFICATE

I, the undersigned, declare that I have edited the **DPhil thesis of ONALENNA TSIMA**, titled:

DEVELOPMENT OF A PROGRAM TO MANAGE CANCER SERVICE DELIVERY IN PRIMARY HEALTH CARE CLINICS IN BOTSWANA

I have read the thesis and made suggestions regarding the layout and use of UK English. I have also verified that all sources listed in the list of references were cited correctly in the thesis and that all in-text references are accounted for in the list of references. While I tried to work as carefully as possible, some errors may have been overlooked, and I may also have made mistakes during the editing process.

Where figures in the thesis were inserted as images, I was unable to make any corrections to them. I also refrained from correcting the English translations of interviewees' citations, since these quotations had to reflect the language and diction of the interviewees.

I consulted the guide for doctoral students from the Department of Health Studies at UNISA and attempted to comply with the required regulations. Please note that the correct abbreviation for et al. is with a period, not et al as the guide states.

I changed the American spellings of words to the British equivalents, except for the references to titles and names in USA English.

I cannot be held responsible for changes made to the thesis after editing was completed and before it was submitted in its final form for examination, or for submission into the UNISA repository.

Signed: 

Prof (emeritus) P.J. Botha
(Member of the South African Translators' Institute, no. 1000048.)
Date: 30th January 2026

ANNEXURE 13: TURNITIN REPORT

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