DETERMINANTS OF NON-ADHERENCE TO CHEMOTHERAPY AMONG PATIENTS WITH BREAST CANCER AT KENYATTA NATIONAL HOSPITAL

PATRICIA SUMATI

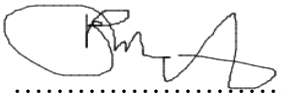
H56/38469/2020

THE DISSERTATION IS SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE CONFERMENT OF THE DEGREE OF MASTER OF SCIENCE IN NURSING (ONCOLOGY NURSING) OF UNIVERSITY OF NAIROBI

NOVEMBER, 2022

DECLARATION

This research project is my own work and has not been submitted in any other institution for examination or award of credit.

Signature  Date 24/11/2022

Patricia Sumati

Reg. no: H56/38469/2020

CERTIFICATE OFAPPROVAL

The research work presented herein is offered for review with our authority as the University supervisors.

Signature ..... Date 24/11/2022

Dr. Irene G. Mageto (BScN, MScN, PhD)

Clinical Mental Health & Forensic Nursing Specialist

Lecturer, Department of Nursing Sciences

University of Nairobi

Signature ..... Date 24/11/2022.

Dr. Eunice A. Omondi

Lecturer

Department of Nursing Sciences

University of Nairobi

Signature..... Date 25-11-2022

Dr. E. Matheka

The Chair

Department of Nursing Sciences

University of Nairobi

DEDICATION

I dedicate this project to my son Tsogolo Nathaniel, siblings and grandmother for their love and sacrifice to see me succeed.

ACKNOWLEDGEMENT

I thank God Almighty for the provision of power of mind that gave me success in my project. I also thank my supervisors DR I. Mageto and DR E. Omondi for their tireless effort in helping me carry out this research. Special thanks to all staffs from Kenyatta National Hospital Oncology clinic for invaluable assistance in gathering field data.

Special thanks to my sponsors the Malawi government for their financial support throughout my studies. I extend my gratitude to Mario Emmanuel Nyirenda, Linda Richard Mkhola and Janet Chagwa Kapito, for the support, prayers and help you rendered to me.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABBREVIATIONS AND ACRONYMS

COM-B	Capability Opportunity Motivation - Behaviour
ERC	Ethics and Research Committee
GBCI	Global Breast Cancer Initiative
HCPs	Health Care Providers
HICs	High Income Countries
ISPOR	International Society for Pharmaceutical Economics and Outcome Research
KNH	Kenyatta National Hospital
LMICs	Low- and Middle-Income Countries
MARS-5	Medication Adherence Report Scale-5
SPSS	Statistical Package for Social Sciences
UoN	University of Nairobi
US	United States
WHO	World Health Organization

OPERATIONAL DEFINITION OF TERMS

Adult A person aged 18 years and above.

Cancer A complex group of diseases characterized by the growth of abnormal cells beyond their usual boundaries that can then invade the adjoining parts of the body and/or spread to other parts of the body or organs.

Breast cancer Cancer that forms in the cells of the breasts.

Breast cancer patient Is an individual, either a man or woman, who has been diagnosed with breast cancer.

Chemotherapy A mode of cancer treatment that uses one or a combination of medicines that causes cell death through interruption of cell division.

Metastasis Is the process through which cancer cells spread from their site of origin to adjoining parts of the body and to other body organs.

Non-adherence For the purpose of this study refers to any patient diagnosed with breast cancer who has been reported to have missed one or more doses of chemotherapy regimen prescribed by their health care team, and which is marked by lower scores on the MARS-5 scale.

Patient related determinants Are factors relating to the individual patient that contributes to their failure to follow the prescribed chemotherapy treatment.

Therapy related determinants Are factors relating to the prescribed mode of treatment that contributes to breast cancer patients' failure to follow the prescribed treatment.

Hospital related determinants	Are factors relating to the centers of care that contribute to breast cancer patients' failure to follow the prescribed chemotherapy treatment.

ABSTRACT

Background: Breast cancer is the most common cancer and the most common cause of cancer death in women worldwide. It exerts a huge burden in form of significant physical, emotional and financial strain on individuals, families, communities and health systems across the globe. Optimal treatment adherence is a critical pillar for the attainment of WHO Global Breast Cancer Initiative of significantly reducing the global breast cancer mortality by 2040. However, attainment of this noble cause is threatened by pervasive non-adherence to chemotherapy among patients diagnosed with breast cancer world over.

Objective: To assess the determinants of non-adherence to chemotherapy among breast cancer patients attending oncology clinic at Kenyatta National Hospital. **Methods:** This was a descriptive cross sectional study that was conducted among 60 adult patients diagnosed with breast cancer who were non-adherent to chemotherapy treatment at the oncology clinic of Kenyatta National Hospital. The study participants were selected using census method. An interviewer-administered questionnaire was used as the data collection instrument. The questionnaire contained questions elicit information on the research subject guided by the study objectives. The study tool was pre-tested at Kenyatta University Teaching and Referral Hospital, using 6 questionnaires. The study data was analyzed through descriptive statistics using the Statistical Package for Social Sciences (SPSS, version 25) and presented through percentages and frequencies. Association between the study's independent and dependent variables were evaluated using the chi-square test at 95% confidence interval.

Result: Findings on patient related determinants; age ($\chi2= 5.583$; $p<.05$), gender($\chi2= 0.136$; $p<.05$), education level($\chi2= 3.148$; $p<.05$), mode of administration ($\chi2= 51.00$; $p<.05$), inaccessibility to cancer treatment ($\chi2= 23.528$; $p<.05$) and availability of medications have significant association with non-adherence to chemotherapy treatment ($\chi2= 27.824$; $p<.05$).

Conclusion: The current study concluded that age, gender, education, mode of administration, inaccessibility to cancer treatment and availability of medications have significant association with non-adherence to chemotherapy treatment.

Recommendation: Proper health education on chemotherapy non-adherence among age groups and level of education, hospitals should stock enough chemotherapy medications and more cancer centers should be set at county levels and properly equipped and staffed.

CHAPTER ONE: BACKGROUND INFORMATION

1.1 Introduction

This chapter presents the background of the study, problem statement, study justification, research questions and study objectives, hypothesis and significance of the study.

1.2 Background Information

Cancer is a generic term for a large group of diseases that can affect any part of the body and characterized by the development of abnormal cells that divide uncontrollably and have the ability to invade adjoining parts of the body and/or spread to other organs (Wild, 2019). Cancer is a leading cause of death worldwide. In 2020, it caused an estimated 10 million deaths, or nearly one in six deaths, making it the second leading cause of death globally after cardiovascular diseases (WHO, 2021).Breast cancer is cancer that forms in the cells of the breasts. It can occur in both men and women, but it's far more common in women. It arises in the lining cells (epithelium) of the ducts (85%) or lobules (15%) in the glandular tissue of the breast and most commonly presents as a painless lump in the breast, though it may present in many other ways(Waks & Winer, 2019; Murphy et al., 2021).

Breast cancer is the most common cancer and the most common cause of cancer death in women worldwide. In 2020, there were 2.3 million women diagnosed with breast cancer and it caused 685,000 deaths globally making it the fifth cause of cancer related mortality overall after lung, colorectal, liver and stomach cancers. It also causes more disability-adjusted life-years lost by women than any other cancer (WHO, 2021). In Kenya, breast cancer accounts for 16.1% of all reported cancer cases and 25.6% of all female cancers. It is the most common cancer among females in the country and ranks a close second in terms of mortality after cervical cancer. In 2020, there were 6,799 breast cancer cases in Kenya and 3,107 breast cancer deaths(MoH, 2021).The burden of breast cancer is disproportionally larger in Low and Middle

Income countries(LMICs)than in high income countries (HICs) (AlOmeir, Patel &Donyai, 2020).

Chemotherapy is a common treatment modality among patients diagnosed with breast cancer. It is the use of drugs, referred to as cytotoxics, to kill or slow the growth of cancer cells. It is considered as a primary treatment for cancer of which no effective alternative treatment is available or when the alternative treatment is less than optimal(Moon et al., 2019). It is given prior to the standard primary therapeutic approach, usually surgery, in patients with locally advanced disease, though it can also be given as the primary treatment modality, in a similar manner as surgery or radiation therapy (Finitsis, Vose, Mahalak, &Salner, 2019). Non-adherence to chemotherapy denotes a cancer patient's failure to take chemotherapy drugs as prescribed or to follow the prescribed chemotherapy treatment regimen (Wako, Mengistu, Dinegde, Asefa & Wassie, 2022).

According to WHO, the average non-adherence rate to chemotherapy among patients with breast cancer globally is 50%, though the non-adherence rates in developing countries are estimated to be much higher (WHO, 2021). For instance, studies by Ingwu et al. (2019) and Anyanwu, Egwuonwu and Ihekwoaba (2011) noted that only about 20% of patients diagnosed with breast cancer were adherent to their prescribed chemotherapy treatment in Nigeria; non-adherence rates to chemotherapy were also as high as 50% in assessed patients in south Africa as reported by Kepkey, Coetzee, Edge and Kagee (2022). Non-adherence rates to chemotherapy of 50 - 70% were also reported among breast cancer patients in Ethiopia (Degu & Kebede, 2021; Wako et al., 2022), in Uganda (Achieng et al., 2021; Nakaganda et al., 2021) as well as in Kenya (Bosire, 2019).

These studies clearly denote that non-adherence to chemotherapy among breast cancer patients remains a significant challenge in the continent. However, while these studies reported on adherence to chemotherapy among breast cancer patients, they did not explore the associated determinants, hence a research gaps exists. Further, in light of the fact that chemotherapy is a potentially life-saving and/or life-prolonging cancer therapy, it is surprising that non-adherence to this therapy is so prevalent (Sella &

Chodick, 2020). Consequently, the current study seeks to evaluate the determinants of non-adherence to chemotherapy among breast cancer patients in the local context.

1.3 Problem Statement

Non-adherence to chemotherapy treatment is a core challenge among breast cancer patients attending oncology clinic at KNH. Health records at the Oncology Unit of Kenyatta National Hospital (KNH) indicate that a significant proportion of patients diagnosed with breast cancer fail to comply with recommended chemotherapy treatment and that the treatment non-adherence problem among these patients has been on the rise. This is as evidenced by the following data captured in the hospital's oncology clinic reports as depicted in Table 1

Table1 Chemotherapy treatment non-adherence rates among breast cancer patients at KNH

	July 2021	August 2021	September 2021	October 2021	November 2021	December 2021
Number of breast cancer patients seen	77	80	80	84	86	90
Documented number of breast cancer patients who failed to adhere to prescribed chemotherapy treatment	37	40	42	45	48	56
Treatment non-adherence rates (%)	48.1	50.0	52.5	53.6	55.8	62.2
Remark	This represents a consistent rise in non-adherence to chemotherapy among patients diagnosed with breast cancer seen in the hospital over the period.					

Source: KNH Oncology Clinics Report, 2021

This unfortunate state of affairs was also affirmed by the researcher's observation while working in KNH's oncology unit that over half of the patients undergoing chemotherapy for breast cancer fail to adhere to prescribed treatment recommendations. Non-adherence to chemotherapy among patients diagnosed with breast cancer is also a recurrent theme on the hospital's oncology unit regular audits reports and staff meetings. Left unattended, this trend risks reversing the gains made in the fight against breast cancer in the country with the attendant unnecessary loss of life. The documented reasons for the high non-adherence rates to chemotherapy among patients diagnosed with breast cancer at KNH are not clear, hence the need for this study.

1.4 Study Justification

Non-adherence to chemotherapy treatment is associated with poor health outcomes among breast cancer patients. It is widely acknowledged that treatment non-adherence is a leading contributor to higher mortality and morbidity among breast cancer patients. Improving these patients' adherence to chemotherapy would thus help to improve survival rates and overall health outcomes in this patient population. Breast cancer is associated with significant economic burden, in form of health care associated costs, both at the patient and societal level. Non-adherence to treatment among breast cancer patients exacerbates this financial burden. Addressing the challenge of non-adherence to chemotherapy among these patients would help to greatly reduce the associated healthcare costs burden on individual patients, their families and on health systems via reduced physician visits, fewer hospitalization rates, shorter hospital stays and better disease management.Optimizing adherence to prescribed chemotherapy medication is essential to maximize treatment effectiveness. This is especially crucial in light of the appreciation that a major consequence of treatment non-adherence is sub-optimal drug efficacy that can result in worse patient outcomes including decreased survival and poor quality of life. Further, the WHO Global Breast Cancer Initiative (GBCI) aims to reduce global breast cancer mortality by 2.5% per year, thereby averting 2.5 million breast cancer deaths globally between

2020 and 2040. Optimal treatment adherence, as a component of comprehensive breast cancer management, is a critical pillar for the attainment of this noble objective.

1.5 Research Questions

1. What are the patient related determinants of non-adherence to chemotherapy among breast cancer patients attending oncology clinic KNH?
2. What are the therapy related determinants of non-adherence to chemotherapy among breast cancer patients attending oncology clinic at KNH?
3. What are the hospital related determinants of non-adherence to chemotherapy among breast cancer patients attending oncology clinic at KNH?

1.6 Study Objectives

1.6.1 Broad Objective

To assess the determinants of non-adherence to chemotherapy among breast cancer patients attending oncology clinic at KNH

1.6.2 Specific Objectives

1. To assess patient related determinants of non-adherence to chemotherapy among breast cancer patients attending oncology clinic at KNH.
2. To evaluate therapy related determinants of non-adherence to chemotherapy among breast cancer patients attending oncology clinic at KNH.
3. To determine hospital related determinants of non-adherence to chemotherapy among breast cancer patients attending at oncology clinic at KNH.

1.7Significance of the Study

Insights derived from this study may inform or influence policy review on treatment adherence among with breast cancer patients at KNH through focused attention on any determinants contributing to their treatment non-adherence. The study findings may also inform cancer care teams' practices with respect to enhancing adherence to chemotherapy treatment among breast cancer patients at KNH through greater emphasis on addressing any factors impeding the patients' adherence to the prescribed chemotherapy treatment. The findings may also inform oncology nursing education with insights generated from the study acting as a basis for formulation of oncology nurses training tools and guides on fostering adherence to chemotherapy treatment among breast cancer patients attending KNH's oncology clinic. Further, the findings from this study may also inform research by acting as a reference point and a basis for further research on the study subject among other scholars and academicians.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter presents a review of literature as guided by the study objectives. The chapter begins with an overview of non-adherence to chemotherapy among patients diagnosed with breast cancer. It also contains review of empirical literature on the patient, therapy and hospital related determinants of non-adherence to prescribed treatment among these patients. The chapter also includes a summary of the reviewed empirical literature and also presents the study's theoretical and conceptual frameworks.

2.2 Non-Adherence to Chemotherapy among Breast Cancer Patients

Treatment adherence, according to the WHO, refers to the extent to which a patient's behaviour, in aspects such as taking medication, following a diet, and/or executing lifestyle changes, corresponds with agreed recommendations from a health care provider. The emphasis here being that treatment adherence requires the patient's agreement to HCP's recommendations as patients should be active partners with health professionals in their own care (Sabate, 2021).Non-adherence, therefore, is when a patient fails to take their treatment medications as prescribed or the patient's failure to follow the prescribed treatment regimen(Gast & Mathes, 2019).Non-adherence to treatment may be intentional or non-intentional.

Evidence from existing empirical literature indicates that non-adherence to long-term therapy remains a persistent challenge among cancer patients including those diagnosed with breast cancer. It is undeniable that many patients diagnosed with breast cancer experience difficulties in following the prescribed treatment modalities(Gast&Mathes, 2019).For instance, in a study evaluating adherence levels to chemotherapy based treatment among women diagnosed with breast cancer in Ethiopia, non-adherence to the therapy was reported in over 60% of surveyed patients (Wako et al., 2022). Similarly, sub-optimal levels of adherence to prescribed therapy

among patients diagnosed with breast cancer were also established in an Indian study undertaken by Kumar et al. (2020).

In a study conducted among survivors of breast cancer in the US, appropriate levels of adherence to chemotherapy treatment were only reported in 45% of surveyed participants, denoting that non-adherence to treatment remained a serious challenge (Zheng & Chagpar, 2022). In a similar study performed in the US as well, less than half of the surveyed patients were also found to have appropriate levels of adherence to prescribed chemotherapy treatment regimen. The study concluded that non-adherence to treatment was a major factor impeding improvement in care outcomes among the participating patients (Spencer et al., 2020). Similarly, in a study on facilitators and barriers to medication adherence among women treated with breast cancer, Tan et al. (2021) reported non-adherence to treatment among 59% of surveyed patients.

Numerous other studies have also highlighted the challenge of non-adherence to treatment among cancer patients. For instance, Paranjpe et al. (2019) noted adequate adherence rates to treatment in less than 30% of interviewed survivors of breast cancer. Similarly, in a systematic review done focusing on adherence to adjuvant hormonal therapy among breast cancer survivors in clinical practice, on average, adherence rates of less than 40% were reported (Murphy et al., 2021). Inadequate levels of adherence to treatment among most of the surveyed patients diagnosed with breast cancer were also reported in studies by Arriola et al. (2014), Bouwman et al. (2017), Chlebowski et al. (2019) and Lin et al. (2017). It is clear therefore that non-adherence to treatment remains a pervasive challenge among many of the patients diagnosed with breast cancer in the various diverse settings.

Patient, therapy and hospital related attributes have been cited as being predictors of non-adherence to chemotherapy among patients diagnosed with breast cancer. These are discussed in the subsequent sections.

2.3Patient Related Determinants of Non-adherence to Chemotherapy among Breast Cancer Patients

2.3.1 Age

One of the patient related factors associated with adherence to chemotherapy treatment among breast cancer patients is their age. There are however mixed findings with studies reporting higher or lower non-adherence rates among older patients. For instance, in studies performed by Lambert et al. (2018) and AlOmeir, Patel and Donyai (2020) evaluating adherence to chemotherapy among breast cancer patients, increasing with older age was identified as a positive predictor of better adherence to prescribed treatment among surveyed participants. The positive association between older age and better treatment adherence was attributed to their greater apprehension of the possible adverse consequences of treatment non-adherence to their health status and survival.

In contrast, Bright et al. (2016) observed poorer adherence levels to treatment among older breast cancer patients compared to their younger counterparts and hence concluded that increasing age was a predictor of non-adherence to treatment among this patient population. This was also the case with Gambalunga et al. (2018) who also reported decreasing adherence to treatment with increasing age among patients diagnosed with breast cancer with Ingwu et al. (2019), Moon et al. (2019) and Tan et al. (2021) reporting similar findings. These studies attributed the poorer adherence rates among older breast cancer patients to forgetfulness, frailty, poor support from family and their increased vulnerability to drug related side effects.

2.3.2 Education Level

The education level of patients is another commonly identified determinant associated with their level of adherence to treatment and this applies to breast cancer patients as well. There is agreement among most of the empirical studies that low education level positively correlates with poor adherence to chemotherapy treatment among breast cancer patients. This was so reported in a study by Skrabal Ross et al. (2020) who

identified low education background as a significant factor that influenced non-adherence to oral antineoplastic drugs among surveyed breast cancer patients. Similarly, studies by Finitsis et al. (2019) and Yusufov et al. (2021) also cited illiteracy as a major risk factor for non-adherence to prescribed therapies among breast cancer patients, sentiments also shared by Greer et al. (2016) and Kumar et al. (2020).The low adherence rates to treatment among breast cancer patients with low education background was linked to their lack of or poor understanding of treatment related instructions and their possible low appreciation of the significance of missing treatment to their health and well-being.

2.3.3 Marital Status

Various studies have also reported variance in treatment adherence levels among patients diagnosed with breast cancer on the basis of their marital status. In these studies, being married was cited as being a positive determinant of these patients' better compliance with prescribed treatment. For instance, Lambert et al. (2018) established that being married positively related with higher adherence level to treatment among patients with breast cancer than being unmarried. Similarly, better adherence rates to treatment were reported among married breast cancer patients compared to their unmarried counterparts in a study conducted by Montagnaet al. (2021). In their studies, Muluneh et al. (2018) also established being married as a positive predictor of better adherence to treatment among their participants. These studies attributed the higher adherence rates to treatment among the married breast cancer patients to the social, psychological and emotional support that the patients received from their spouses including help in form of reminders on when to take medication. The studies also noted that, in most incidences, spouses of patients diagnosed with breast cancer served as their immediate carers at home and offered the patients essential support towards adhering to the prescribed treatment regimen.

2.3.4 Household Income Status

The average cost of chemotherapy treatment based on available literature is a range of $1,000 to $12,000 a month depending largely on the type of medication being used.

Literature also identifies patients' household income status/level as also a determinant in their compliance with prescribed treatment and this has also been reported among breast cancer patients. In a study evaluating the predictors of non-adherence to chemotherapy treatment among breast cancer patients in Nigeria, poor adherence to chemotherapy was established to positively correlate with patients' low household income status (Ingwu et al., 2019). Clancy et al. (2020) while reviewing the adherence to chemotherapy treatment experiences among breast cancer patients, also cited patients' household income status as one the variables that influenced their treatment adherence levels.

Similarly, in studies by Bouwman et al. (2017) and Gambalunga et al. (2018), poverty or low household income status was identified as a major factor contributing to low compliance rates with treatment among surveyed breast cancer patients. Chemotherapy treatment, world over, is relatively expensive and low household incomes imply that patients are unable to afford the treatment in turn fueling the non-adherence rates. This is especially more evident in low resource countries where governments are unable to subsidize the cost of chemotherapy treatment which in turn makes this treatment out of reach for many of the cancer patients. This is also evident in settings where treatment needs have to compete with other pressing basic needs such as food, clothing and shelter over inadequate household financial resources.

2.3.5 Attitude towards the Prescribed Therapy

The attitude of patients with breast cancer towards chemotherapy has also been identified as another determinant of their level of compliance with the treatment. As noted by Sella and Chodick (2020), having the right attitude towards prescribed treatment is an important element in any patient's treatment journey. According to studies by Greer et al. (2016), D'Amato (2018) and Paranjpe et al. (2019), positive perception towards the prescribed therapy among surveyed breast cancer patients positively influenced their adherence to treatment while negative attitude towards the prescribed therapy was seen to adversely influence their treatment adherence. This view was also affirmed in studies by Chlebowski et al. (2019) and Krikorian et al. (2019) which also identified negative attitude towards the prescribed therapy among

breast cancer patients as one of the factors that contributed to their low adherence to prescribed cancer therapy.In these studies, patients' perception of the efficacy of the prescribed therapy influenced their attitude towards the treatment with high perceived treatment efficacy leading to positive attitude while low perceived treatment efficacy leading to negative attitude towards the prescribed treatment.

2.4Therapy Related Determinants of Non-adherence to Chemotherapy among Breast Cancer Patients

2.4.1 Mode of Administration

Chemotherapy drugs can be administered in various ways with the main modes being oral, intravenous and injections, though they may also be administered via other mechanisms such as intrathecal (into the cerebrospinal fluid via spinal cord), intra-arterial, intra-peritoneal, intravesical, intrapleural as well as subcutaneous and intra-muscular treatments (Murphy et al., 2021). The manner and ease with which cancer medication is administered is one of the variables identified by literature as influencing adherence to treatment among breast cancer patients. Regarding the mode of administration, studies by Tan et al. (2021) and Yusufov et al. (2021) reported higher adherence rates to treatment among patients whose medication was orally administered in form of pills compared to those whose medication was administered through the injection mode. Similar findings were reported by Toivonen et al. (2020) who established oral administration of cancer medication as being associated with better adherence to treatment compared to other hospital based modes of administration such as intravenous modes. As averred by Murphy et al. (2021) and supported by Spencer et al. (2020), the greater the ease and flexibility of a given mode of medication administration, the higher the likelihood of better compliance levels to the treatment and vice-versa.

2.4.2 Side Effects of Treatment

Chemotherapy treatment has been shown to have a wide range of side effects among cancer patients utilizing it including hair loss, weight loss, fatigue, pain, insomnia,

nausea, poor appetite, dry mouth, and constipation. It may also result in bleeding, infection, cognitive changes, problems with sexual function and fertility, skin and nail changes, fluid retention, and damage to the central nervous system and heart (Chlebowski et al., 2019). These side effects may have a toll on the patients (Montagna et al. 2021). Studies have established association between poor adherence to chemotherapy treatment with the experience of these side effects among patients. For instance, a study by Muluneh et al. (2018) cited chemotherapy side effects as a pertinent barrier towards compliance with the treatment among surveyed cancer patients. Studies by AlOmeir et al. (2020) and Gast and Mathes (2019) also established the adverse side effects attributable to chemotherapy treatment such as fatigue, hair loss, nausea and vomiting, infections, sexual dysfunction and fertility problems, which impaired their normal daily functioning in physical, social and sexual spheres, led to low treatment adherence levels among patients diagnosed with breast cancer, sentiments also echoed by Finitsis et al. (2019).

2.4.3 Duration of Treatment

The duration of chemotherapy treatment constitutes another identified variable that influences breast cancer patients' adherence to the therapy. For early-stage breast cancer, chemotherapy treatments last 3 - 6 months on average while chemotherapy treatments for advanced breast cancer often continue beyond 6 months to several years. Each cycle of chemotherapy treatment contains multiple treatment sessions performed once a day, week, or month. The length of treatment for metastatic breast cancer depends on how well it is working and nature of side effects the patient experiences (Kumar et al., 2020; Tan et al., 2021). The patients also undergo blood work which includes red blood cell (RBC), white blood cell (WBC) and platelet counts before they go for the next cycle of treatment (Waks & Winer, 2019). There is concurrence among various studies findings that shorter treatment durations correspond with better treatment adherence rates among patients and vice-versa(Neugut et al., 2016).

In a study performed in Israel exploring adherence levels to adjuvant hormonal therapy and associated factors among in early-stage patients with breast cancer, higher

treatment adherence levels were seen among patients under short-term treatment regimen compared to those under long-term forms of treatment (Sella&Chodick, 2020). Wako et al. (2022) did also establish the long term nature of cancer treatments as a major barrier to treatment adherence among surveyed women who had breast cancer. Studies by Bright, et al. (2016) and Gambalunga et al. (2018) also pointed to the long term duration of chemotherapy regimens as one of the factors contributing to low treatment adherence rates among patients diagnosed with breast cancer. The association between long treatment duration and higher treatment non-adherence rates among the breast cancer patients was largely attributed to a phenomenon referred to as '*treatment fatigue* in which patients become tired and disoriented of following a prescribed therapy over a prolonged time period.

2.4.4 Affordability of Treatment

Another therapy related attribute that has been associated with levels of adherence to treatment among patients diagnosed with breast cancer is the affordability of treatment or cost of treatment. In many settings, the high cost of chemotherapy coupled by many patients' inability to afford it is cited as a significant barrier to these patients' adherence with the treatment. For instance, in a study undertaken in Nigeria, Ingwu et al. (2019) identified the high cost of chemotherapy treatment of N600,000 - N1.5 million compared to the basic wage of N30,000 as one of the leading factors that contributed to these patients' not adhering to the treatment. Similar findings were reported by Paranjpe et al. (2019) and Kumar et al. (2020) who established the average cost of chemotherapy in India of approximately Rs. 75,600 relative to the basic wage of about Rs. 176 to be a leading barrier to breast cancer patients' adherence to the treatment. Similar sentiments were shared by Bouwman et al. (2017) who also cited the high cost of treatment for breast cancer as a major predictor of the low treatment compliance rates among affected patients. High chemotherapy treatment costs remain largely unaffordable to many of the cancer patients who need the treatment particularly in low resource countries and this contributes to treatment non-adherence among these patients.

2.5Hospital Related Determinants of Non-adherence to Chemotherapy among Breast Cancer patients

2.5.1 Inaccessibility of Cancer Treatment

Inaccessibility of cancer treatment due to few cancer treatment centres located often in urban areas only is one of the hospital related factors commonly identified as being a determinant of cancer patients' adherence to treatment. For instance, patients with breast cancer in Nigeria had to incur huge transportation costs to seek chemotherapy treatment in the country's major cities where the service is available in Government hospitals. And even after getting to the few available cancer treatment facilities, they had to endure long waits for treatment due to the hospital's inadequate staffing and oncology infrastructure (Ingwu et al., 2019).Few number of breast cancer chemotherapy treatment centres and their concentration mainly in large urban centres also impeded accessibility to chemotherapy treatment among breast cancer patients who resided in rural and remote areas of US as reported by Bright et al. (2016).

Similar findings were reported by Krikorian et al. (2019) who also identified poor accessibility of chemotherapy treatment owing to few treatment centres and their biased location in relatively higher income or urbanized areas was one of the leading challenges that adversely influenced adherence to chemotherapy among patients diagnosed with breast cancer particularly those who resided in rural and remote areas. These views were also shared by Lambert et al. (2018), Moon et al. (2019) and Skrabal Ross et al. (2020).In these studies, the requirement for patients with breast cancer to travel long distances, usually at considerable costs/expense in the face of huge financial constraints, to access chemotherapy treatment centres often led to their non-adherence with the treatment.

2.5.2 Nature of Patient-Provider Relationship

The nature of relationship between the patient and the health care providers constitute another important hospital related determinant of treatment adherence among patients diagnosed with breast cancer. A good patient-health care provider relationship

characterised by empathy, open and effective communication and shared decision-making is instrumental to treatment adherence among patients with breast cancer (Gast & Mathes, 2019). Studies by Clancy et al. (2020) and Murphy et al. (2021) showed that a positive and constructive interaction between breast cancer patients and their care providers, in the form of mutual respect, shared decision-making and regular, open communication regarding the patient's health status, led to better compliance with treatment among the surveyed breast cancer patients.Similarly, studies by Toivonen et al. (2020) and Tan et al. (2021) also found poor patient-healthcare providers relations characterised by poor communication, lack of trust and HCPs' lack of empathy, as contributing to poor adherence to chemotherapy treatment among surveyed patients with breast cancer, an observation also supported by Arriola et al. (2014).

2.5.3 Timing of Clinic Schedules

Timing of clinic schedules is another factor that has been identified as being an important determinant of treatment adherence among patients diagnosed with breast cancer. Timing of clinic schedules denotes the number and frequency of required patient visits to a healthcare facility or physician for treatment needs, and how well this fits into the patient's normal schedule(Finitsis et al., 2019). Studies by Chlebowski et al. (2019) and Kumar et al. (2020)showed that breast cancer patients who received weekly chemotherapy sessions adhered better to treatment compared to those on monthly chemotherapy sessions. The better adherence in shorter chemotherapy cycles was attributed to regular patient-HCP contacts which offered a better opportunity for the HCPs to monitor and constantly remind the patients of the importance of strict observance of the prescribed therapy.

Similarly, studies by Gast and Mathes (2019) and Muluneh et al. (2018) also found better adherence to chemotherapy treatment among breast cancer patients with shorter chemotherapy cycles marked by one or two chemotherapy sessions each week compared to those with longer cycles requiring a single or few chemotherapy sessions each month, sentiments also echoed by Puts et al. (2014) and Spencer et al. (2020). On the overall, a more flexible and patient conscious chemotherapy clinic schedule

correlates with better compliance with treatment among surveyed breast cancer patients while a more rigid clinic schedule relates to higher levels of non-compliance to the treatment module.

2.5.4 Availability of Medications

Availability of medications is also one of the hospital related variables that has been cited as influencing adherence to treatment among persons diagnosed with cancer. This was so reported by Paranjpe et al. (2019), Kumar et al. (2020) and Wako et al. (2022) who in studies on adherence to chemotherapy and its associated factors in women diagnosed with breast cancer identified the unavailability of cancer medications, particularly in rural local settings hence forcing these patients to either miss the treatment or to travel long distances in search of the treatment, was a major factor that contributed to poor treatment adherence among the surveyed patients. Clancy et al. (2020) in a review of adherence experiences among patients with breast cancer receiving chemotherapy also noted that low availability of cancer drugs in local health centres hence requiring the patients to travel long distances to find the treatment did significantly impede these patients' compliance with prescribed treatment.

2.6 Summary of Literature Reviewed

The above reviewed empirical literature indicates that a wide range of patient, therapy and hospital related factors did contribute to non-adherence to treatment among patients diagnosed with breast cancer across the diverse settings. According to the literature, the main deterrents to adherence to chemotherapy treatment among patients diagnosed with breast cancer included low education level, low household income status, poor patient attitude towards the treatment, high cost of the treatment and its related side effects, inaccessibility of the treatment, poor patient-healthcare provider relationships and poor availability of the chemotherapy medications. Further, out of the 31 studies reviewed, 23 were from the developed countries in Europe and North America; 7 were from the developing countries in Asia and Latin America and 1 was from the sub-Saharan region. None had been done in Kenya. This clearly illustrates

that the reviewed empirical studies were conducted in other countries whose healthcare settings and systems differ from that of Kenya. Hence, it is desirable to validate their findings in the local context. It is evident from the literature reviewed that there is paucity of local empirical studies on determinants of non-adherence to chemotherapy among patients diagnosed with breast cancer. Consequently, to address this existing research gap, the current study aims to evaluate the determinants of non-adherence to chemotherapy among patients diagnosed with breast cancer attending Kenyatta National Hospital's oncology clinic.

2.7 Conceptual Framework

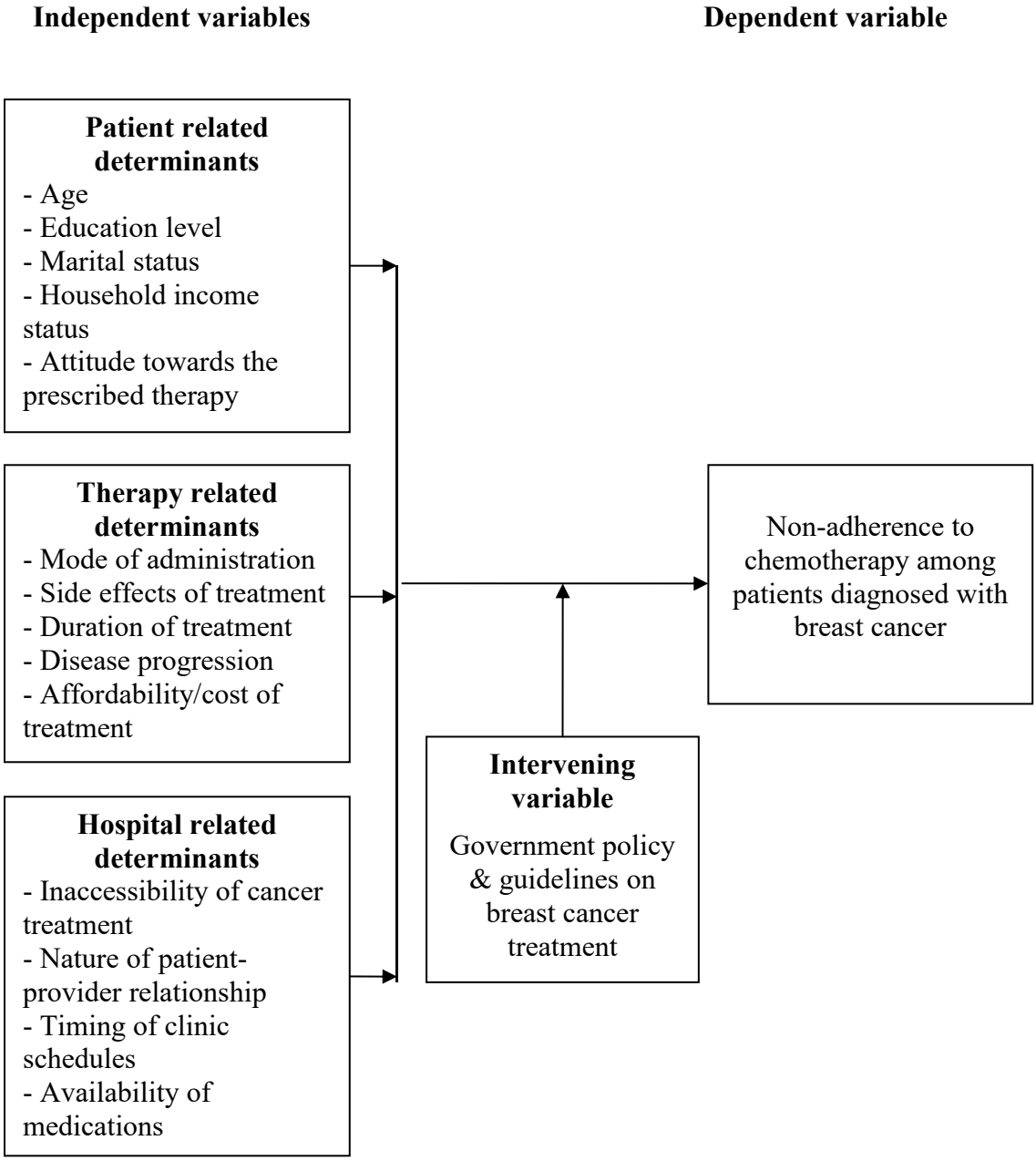


Figure 2 Conceptual framework

Source: Researcher, 2022

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes the research materials and methods that were applied by the researcher in order to attain the objectives of the study. The chapter thus outlined the study design, study area, study population, the criteria for inclusion and exclusion, sample size and sampling technique, the instruments of data collection, procedures for data collection, pretesting, the research tool validity and reliability, data analysis, dissemination of study findings, ethical considerations and study limitations.

3.2 Study Design

This was a descriptive cross sectional study. This research design presents facts concerning variables being investigated as they existed at the time of study as well as trends that are emerging. The descriptive method was preferred because it ensures complete and accurate description of a situation, ensuring that there is minimum bias in the collection of data (Kothari, 2010).

3.3 Study Area

Kenyatta National Hospital (KNH) Oncology Unit was the site where this research study was conducted. KNH is the oldest and largest teaching and referral hospital in Kenya. It was founded in 1901 with 40 patients with the hospital having grown over the years to its current bed capacity of about 2,000. It is located about four kilometers from the Nairobi city center, off Ngong road on Hospital road. The facility offers a wide range of specialized in and out-patient health care services. The specialized health-care services provided at KNH include, heart surgery, neurosurgery, oncology, diabetic, renal dialysis and kidney transplant operations, plastic and reconstructive surgery, orthopedic surgery and burns management among others. The hospital also facilitates medical training and research and participates in national healthcare planning. KNH's oncology unit is the largest in the country and serves patients with different kinds of cancers from across the country on a referral basis. The oncology

unit at KNH has 2 major departments namely radiotherapy and chemotherapy. Patients diagnosed with breast cancer and undergoing chemotherapy are seen within the unit's chemotherapy department. Approximately 90breast cancer patients are currently undergoing chemotherapy in the hospital's oncology clinic.

Kenyatta National Hospital was an appropriate area of study for this research as it has a wide catchment area from which it draws its clients. It is also a leading centre of care for cancer patients in the country and beyond. The hospital had also been selected because non-adherence to chemotherapy treatment among patients diagnosed with breast cancer remains a challenge at the facility, yet the determinants for the non-adherence to treatment among this cohort in the hospital remains unclear.

3.4 Study Population

The study population consisted of adult patients diagnosed with breast cancer who were undergoing chemotherapy treatment at KNH's oncology clinic. Hospital records indicated that there are 60 adult patients with breast cancer on monthly average who were non-adherent to chemotherapy in the oncology clinic of KNH (KNH Oncology Unit Records, 2021). This constituted the study population.

3.5 Inclusion and Exclusion Criteria

3.5.1 Inclusion Criteria

The study included all adult patients diagnosed with breast cancer, reported to have missed one or more doses of chemotherapy treatment who voluntarily consented by signing to participate in the study were recruited.

3.5.2 Exclusion Criteria

The study excluded;

- adult patients diagnosed with breast cancer, who reported to have missed one or more doses of chemotherapy with mental health disorders

- adult patients diagnosed with breast cancer, who reported to have missed one or more doses of chemotherapy who were critically ill
- adult patients diagnosed with breast cancer, who reported to have missed one or more doses of chemotherapy who had not voluntarily consented

3.6 Sample Size and Sampling Technique

The researcher used census method whereby all adult patients diagnosed with breast cancer and documented or classified as defaulters/non-adherers of chemotherapy treatment in patients' records at the oncology clinic of KNH were recruited to form the study sample. This is in accordance with Kothari (2004) who postulated that a sample of 100% of the target population is used when the target population is small. As such, the study sample comprised of the 60 adult patients diagnosed with breast cancer and who were documented as defaulters of chemotherapy treatment at KNH's oncology clinic excluding adult patients diagnosed with breast cancer, who reported to have missed one or more doses of chemotherapy who had not voluntarily consented.

3.6 Data Collection Instrument

The data collection instrument for this study was an interviewer-administered questionnaire (Appendix 3). The questionnaire contained questions based on the objectives of the research study. The questionnaire was structured into 4 parts. Section A contained questions on the patient related determinants of non-adherence to chemotherapy among the respondents. Section B contained questions on the respondents' non-adherence to chemotherapy treatment (which was assessed using the MARS-5 scale, a validated questionnaire commonly applied to assess patients' medication adherence. Each of the 5 items of the tool were scored from 1 to 5 [1 = always, 5 = never] resulting into a minimum sum score of 5 and a maximum sum score of 25. The lower the score, the less adherent is the patient) (Bouwman et al.,

2017). Section C contained questions on therapy related determinants of non-adherence to chemotherapy among the respondents. Section D contained questions on the hospital related determinants of non-adherence to chemotherapyamong the respondents.

3.7.1 Pretesting of the Study Tool

Pretesting of the study tool was carried out among patients diagnosed with breast cancer at the Kenyatta University Teaching and Referral Hospital. Six (6)questionnaires representing 10% of the study sample were used. Mugenda and Mugenda (2003) asserted that 10% of the sample size is adequate for purposes of pre-testing the research tools. Upon completion of pretesting, the study tool was modified where applicable and a final validated version of the study tool was made.

3.7.2 Validity and Reliability of the Study Tool

Validity refers to the degree to which an instrument measures what it is supposed to measure (Kothari, 2010) or whether the findings obtained from the analysis of the data represent the phenomena under study (Denscombe, 2014). The study tool was availed to the supervising lecturers and peers who helped establish its content and construct validity to ensure that the items were adequately representative of the study subject.

Reliability is the ability of a research instrument to produce consistent findings on repeated trials (Nsubuga, 2006). The reliability of the study tool was evaluated using both the test-retest reliability method as well as using the Cronbach's Alpha Coefficient. The Cronbach's Alpha Coefficient is a measure of internal consistency of the study tool's items**.** Test-retest reliability is a measure of consistency between measurements of the same construct administered to the same sample at two different points in time (Kothari, 2010). This was achieved by administering the study tool to the pretesting sample on two occasions within a time lapse of 2 weeks and then

comparing correlation of the results of the two tests. The tool was reliable since correlation between the two sets of test since observed had not changed substantially.

3.8 Participants' Recruitment and Consenting Procedures

Following ethical approval from KNH-UoN ethics and authorization from KNH Medical research department, the researcher got permission from in-charge from Oncology clinic to access details of patients with breast cancer that were attending Oncology clinic and had missed one or more doses of chemotherapy treatment from patients' records at Oncology clinic. The researcher then reached out to the identified patients where she provided them with brief about the study and requested for their permission to participate in the study. During initial contact the researcher introduced herself; informed the participants the purpose of the study. The briefing was not more than 5 minutes. During this brief encounters, the researcher offered important points about the study emphasized on the selection criteria and disclosed where the researcher could be found for further details within Oncology clinic. Those patients who met inclusion criteria were requested to meet/see the researcher at Oncology clinic's Confidential Counselling Office at their convenience time for in-depth information and procedure of participation

As part of the participation procedure, the patients gave their informed consent prior to participation in the study. This entailed signing the study's informed consent document. This was however after they were adequately briefed by the researcher about the study. The considerations of the consenting environment included; voluntary participation, respect for the dignity and autonomy of the participants, ensuring confidentiality of any information provided and ensuring that the study participants felt at ease during the data collection exercises. Those who declined participation in the study were allowed to do so without victimization.

3.9 Data Collection Procedures

The data collection process began with the participants providing their informed consent by signing. The study tool was interviewer-administered on the respondents.

As such, the respondents were allowed to give responses to the study tool's questions. The data collection exercise was conducted through researcher assisted questionnaire. The data collection was held in confidential counseling office within KNH's Oncology clinic. Therefore questionnaires responded were safely kept prior to its analysis. The data collection exercise took approximately 2weeks.

3.10 Data Storage

The responded to study tools and informed consents was safely locked in a cupboard accessed only by the researcher. The data in the filled-in questionnaires was entered into Ms Excel and stored in a password protected computer only used by the researcher. Further, a copy of the data was saved in a password protected flash disk kept by the researcher as back-up. All these were done to ensure safety of the study data.

3.11 Data Analysis

Data cleaning and entry preceded analysis. The study data was analyzed through descriptive statistics using the Statistical Package for Social Sciences (SPSS version 25.0) and presented through frequencies and percentages. Further, association between the study's independent and dependent variables was assessed using the chi-square test at 95% confidence interval. Study findings were presented in tables, graphs and charts.

3.12 Ethical Considerations

The study observed the following ethical principles;

Justice: This was observed through ensuring that all the participants were treated equally without bias, and in a manner that was consistent with the laws governing research. The participants were also subjected to the same inclusion and exclusion criteria ensuring fairness in the sample selection process.

Beneficence: This was observed by ensuring that at all time the intent of the study was to do good to the participants. Findings from this study informed development of necessary strategies and interventions to improve adherence to chemotherapy treatment among patients diagnosed with breast cancer at KNH. However, no inducements or any form of financial compensation or rewards was given to the participants to join the study. As the principal researcher used the researcher assisted questionnaire on patients attending Oncology clinic at KNH who met inclusion criteria, so there was no extra cost to the participants

Non-maleficence: This was observed by ensuring that this research study did not cause harm to the participants. There was no any intended health risk or any other harm to participants for participating in this study. However, in the event that the study participant suffered emotional or psychological distress for participating in this study, the researcher referred them to a counselor for appropriate help. The researcher liaised with the Counseling Unit within KNH's Oncology Clinic that expressed readiness and willingness to provide counseling services to any participants who may be in need. Therefore, participants experienced any emotional and/or psychological distress were linked with the Counseling Unit at KNH's Oncology Clinic for appropriate help.

Autonomy: This was observed by ensuring that participants made their own choices about their own thoughts, intentions, and actions. In this study, only willing respondents were recruited to participate in the study. The identities of all respondents were kept anonymous by ensuring the use of codes and not names or any personal identifiers. Participation in the study was on a voluntary basis and participant's thoughts, wishes and actions were respected at all times.

Ethical approvals: Ethical approval for the study was sought from the KNH-UoN ERC followed by NACOSTI. In addition, authority to conduct the research was obtained from KNH medical research department. The researcher sought permission to access study participants from in-charge of the Oncology clinic.

Consenting: All participants gave their informed consent prior to participation in the study. This entailed signing the study's informed consent document. This was however after they were adequately briefed by the researcher about the study. The researcher responded to any queries or concerns that a participant might had about the study. The considerations of the consenting environment included voluntary participation, respect for the dignity and autonomy of the participants, ensuring confidentiality of any information provided and ensuring that the study participants felt at ease during the data collection exercises. Those who declined to participate in the study were allowed to do so without victimization.

3.13 Study Limitations

The researcher/study may not receive 100% response rate from the target respondents thus limiting the available data for analysis. To address this limitation, the researcher accorded the respondents sufficient time to respond to the questionnaire in order to enhance the response rate. A contingency margin of 10% of the study sample size was added to the sample size.Some respondents were hesitant to participate in the study due to fear of victimization and sensitivity of the issue under study. To address this limitation, the respondents were assured of confidentiality of information provided and that the information given is used for academic purposes only and responded to the tool anonymously.

3.14Study Findings Dissemination Plan

The study findings will be disseminated through forwarding a copy of the final dissertation report to the department of nursing sciences of University of Nairobi, to the university's library and to Kenyatta National Hospital's oncology clinic. The researcher also endeavored to present the findings in appropriate academic and scientific workshops and conferences. The work will also be published in a relevant peer-reviewed journal

CHAPTER FOUR

DATA ANALYSIS AND FINDINGS

4.1 Introduction

This chapter presents analysis of data collected at oncology clinic at KNH. It begins by analyzing data as per the research questions which guided the study. The study was guided by three objectives which were; to assess patients related determinants of non-adherence to chemotherapy, to evaluate therapy related determinants and to determine hospital related determinants of non-adherence to chemotherapy among breast cancer patients.

4.2 Patients related determinants of non-adherence to chemotherapy among breast cancer patients

4.2.1 Age

The study showed that the mean age of the respondents was 46. The minimum age among the respondents was 22, while the maximum age was 79. Therefore, the respondents' age ranges were 22-79. Of the 54 patients: 4% (n=2) were in 21-30 years; 28% (n=14) were in 31-40 years; 48% (n=24) were in 41-50 years; 10% (n=5) were in 51-60 years; 10% (n=5) were in 61-70 years and 8% (n=4) were in 71-80 years.

Table 2: Age

Age	respondents	Percentage (%)
20-30	2	4
30-40	14	28
40-50	24	48
50-60	5	10
61-70	5	10
71-80	4	8
Total	54	100

Age had a significant association with non-adherence to chemotherapy among patients diagnosed with breast cancer ($\chi 2 = 5.583$; $p<0.05$). This shows that patients in 30's and 40's have higher non-adherence to chemotherapy

Table 3: relationship between age and non-adherence to chemotherapy

	miss out a dose			
Age	**Sometimes**	**Never**	**Chi-square value**	**p-value**
20 – 30	2	0	5.583	0.014
31 – 40	10	4		
41 – 50	22	2		
51 – 60	5	0		
61 – 70	3	0		
71 – 80	2	0		

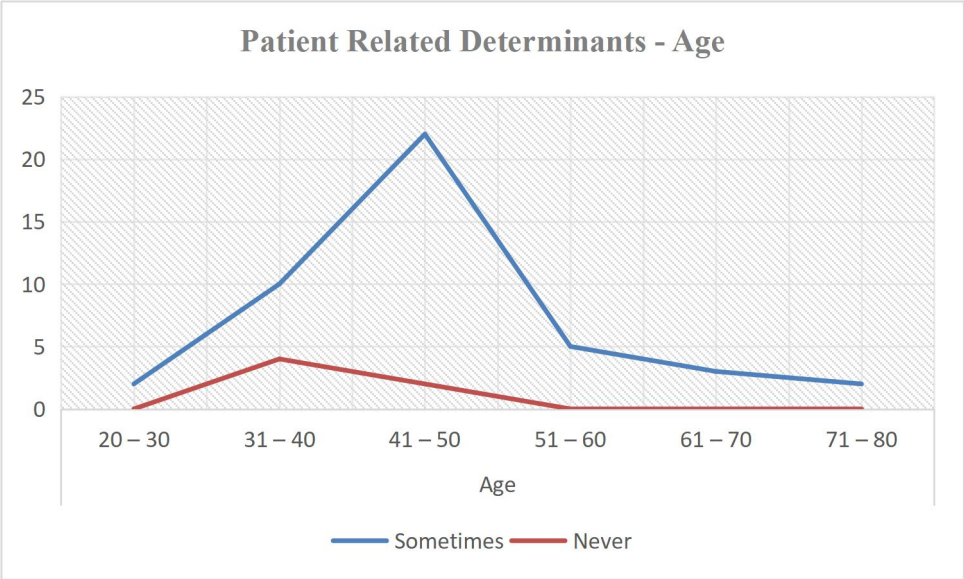


Figure 2; Patient non-adherence, age

4.2.2 Gender of Respondents

Majority of the respondents were females than males. The female respondents were 98.1% (n=53) and male respondents were only 1.9% (n=1). This shows that there were more females than male among the study participants

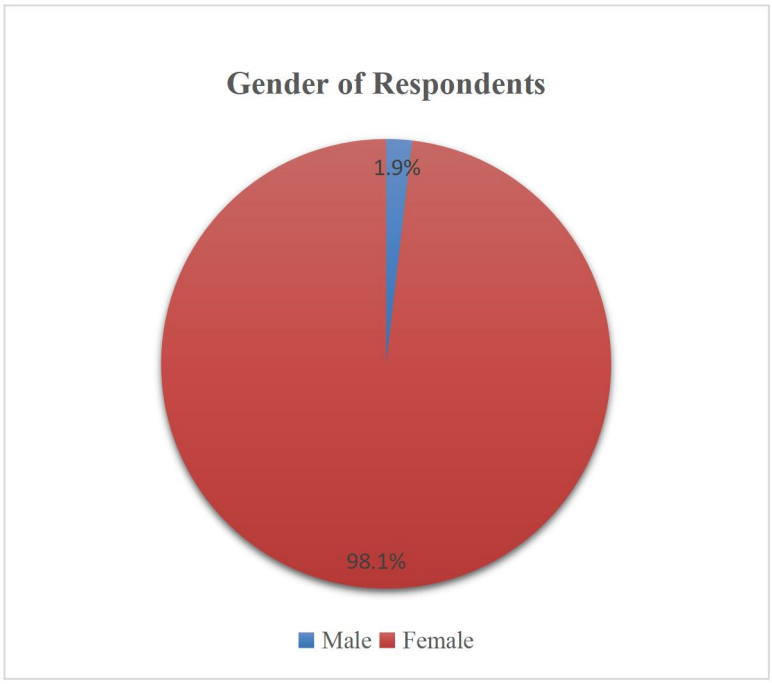


Figure 3; Gender of Respondents

Gender showed had a significant association with non-adherence to chemotherapy among breast cancer patients with ($\chi 2$= 0.136; $p<0.05$).

Table 4: relationship between gender and non-adherence to chemotherapy

Gender	miss out a dose			
	Sometimes	**Never**	**Chi-square value**	**p-value**
Male	1	0	0.136	0.000
Female	44	6		

4.2.2 Education Level

The study results showed 33.3% (n=18) had attained a secondary education, 31.3%(n=17), primary education,18.5%(n=10) had no formal education, and 16.7%(n=9) had attained tertiary education. The study showed most patients attended secondary schools are non-adherence to chemotherapy.

Table 5; Education level

Level of Education	Count of Respondents	Percent(%)
No formal education	10	18.52
Primary education	17	31.48
Secondary education	18	33.33
Tertiary education	9	16.67
Total	**54**	**100.00**

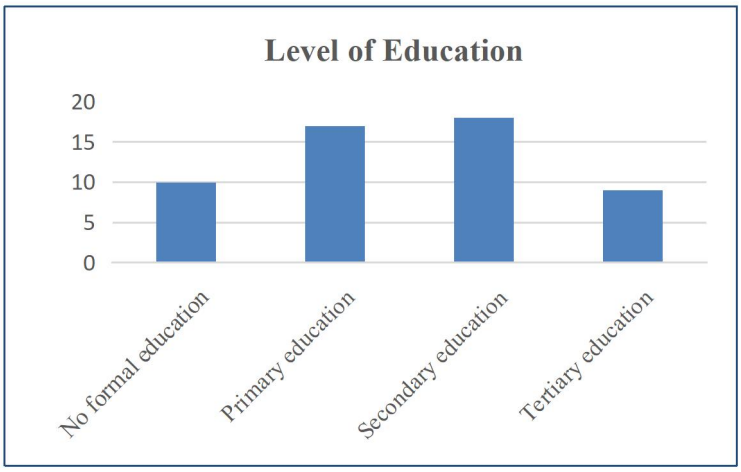


Figure 4; Level of Education

The level of education showed a significant association with of non-adherence to chemotherapy among breast cancer patients with ($\chi 2$= 3.148; $p<0.05$). Most of those who were not adhered to treatment had secondary level

Table 6 relationship between education level and non-adherence to treatment

	miss out a dose			
Education level	**Sometimes**	**Never**	**Chi-square value**	**p-value**
No formal education	8	0	3.148	0.017
Primary education	14	3		
Secondary education	16	1		
Tertiary education	7	2		

4.2.3 Marital Status

The study results showed that 43.1%(n=22) of the respondents were married, 27.5%(n=14) were divorced, 17.6%(n=9) were widowed, and 9.8%(n=5) were separated while 2%(n=1) single.

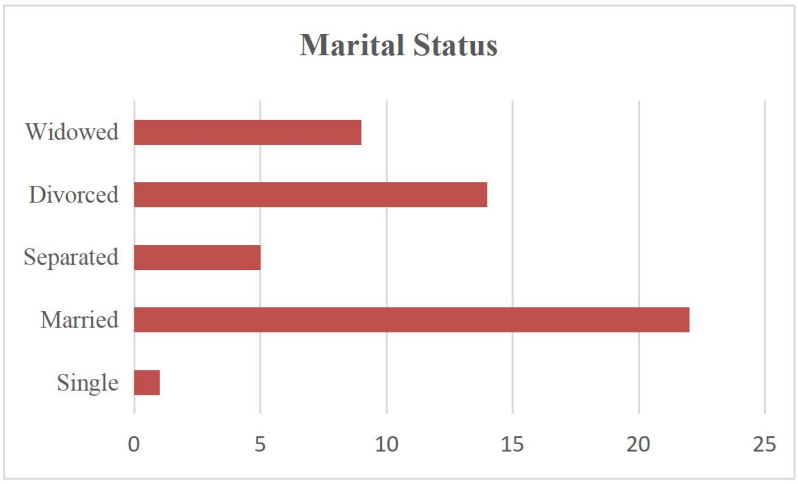


Figure 5; Marital Status

The study results showed that marital status had no significant association with non-adherence to chemotherapy treatment ($\chi 2 = 0.436$; $p > 0.05$)

4.2.4 Livelihood

Further, the study results showed that 37.9%(n=20) earned their livelihood from farming, 25.9% (n=14) were doing business and a similar number, 25.9%(n=14) were employed in various capacities including, teaching, waiting staff and caretaker of building. In addition, 9.6%(n=5) of the respondents were housewives and 1.9%(n=1) were students.

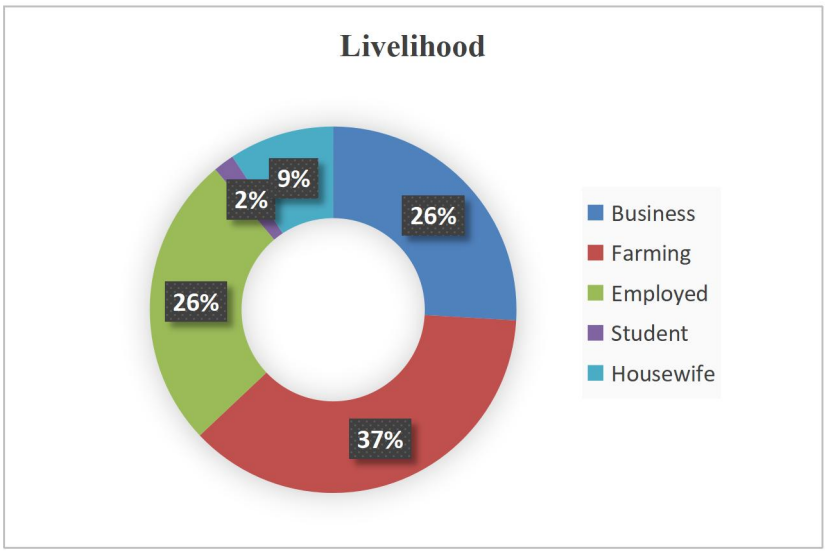


Figure 6; Livelihood

Further the study results showed respondents household income status had no significant association with of non-adherence to chemotherapy among breast cancer patients among patient ($\chi 2 = 4.366$; $p > 0.05$).

Table 7: Relationship between household Income Status and non-adherence to chemotherapy

	miss out a dose			
Household Income Status	**Sometimes**	**Never**	**Chi-square value**	**p-value**
$5,000	12	0	4.366	0.737
$7,000	1	0		
$8,000	2	0		

$10,000	19	3		
$12,000	3	1		
$15,000	5	1		
$18,000	1	0		
$20,000	2	1		

4.2.5 Chemotherapy helpful to health condition

The study results showed that most of the respondents 96.2%(n=51) indicated that chemotherapy was highly helpful to their health condition while only 3.8%(n=3) did not consider chemotherapy was highly helpful to their health condition. These results are contained in figure 7.

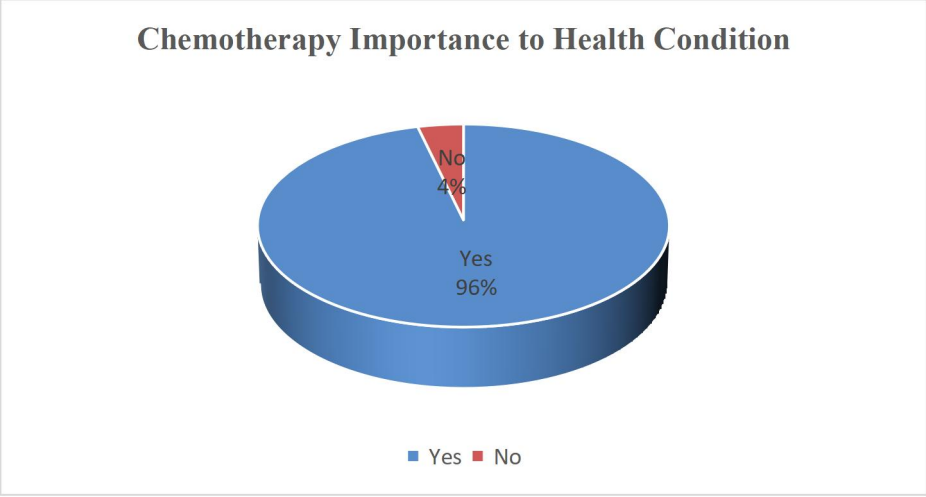


Figure 7; Chemotherapy Importance to Health Condition

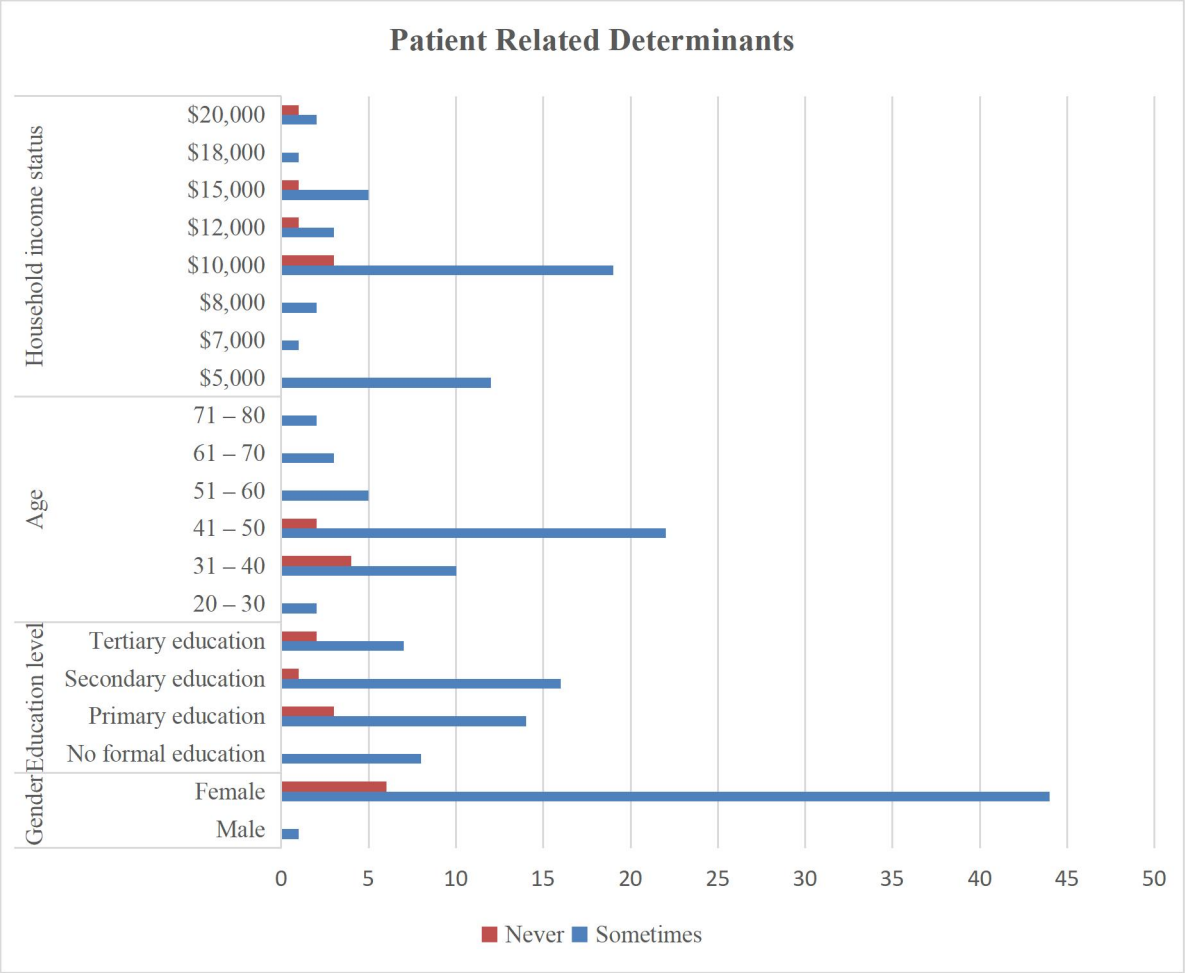


Figure 8; relationship between patient related determinants and non-adherence to chemotherapy

4.3 Non-adherence to Chemotherapy

Findings showed that most of the respondents, 86% (n=43) indicated that they never forget to take their prescribed chemotherapy treatment, however 14% (n=7) sometimes forget. According to results almost all of the respondents, 98% (n=48) stated that have never alter their prescribed chemotherapy treatment dose while 2%

(n=1) stated that they have rarely altered their prescribed chemotherapy treatment dose. According to results almost all of the respondents, 96.1% (n=49) stated that they have never stopped taking prescribed chemotherapy treatment dose for a while, and only 3.9%(n=2) stated that for sometimes they stopped taking prescribed chemotherapy treatment dose for a while. Further, majority of the respondents, 88.2%(n=45) said that they sometimes decide to miss out prescribed chemotherapy treatment dose but 11.8%(n=6) have never decide to miss out prescribed chemotherapy treatment dose. Lastly, most of the respondents, 93.9%(n=46) indicated that have never taken less than instructed chemotherapy treatment dose, however 4.1%(n=2) rarely taken less than instructed chemotherapy treatment dose and 2%(n=1) sometimes take taken less than instructed chemotherapy treatment dose.

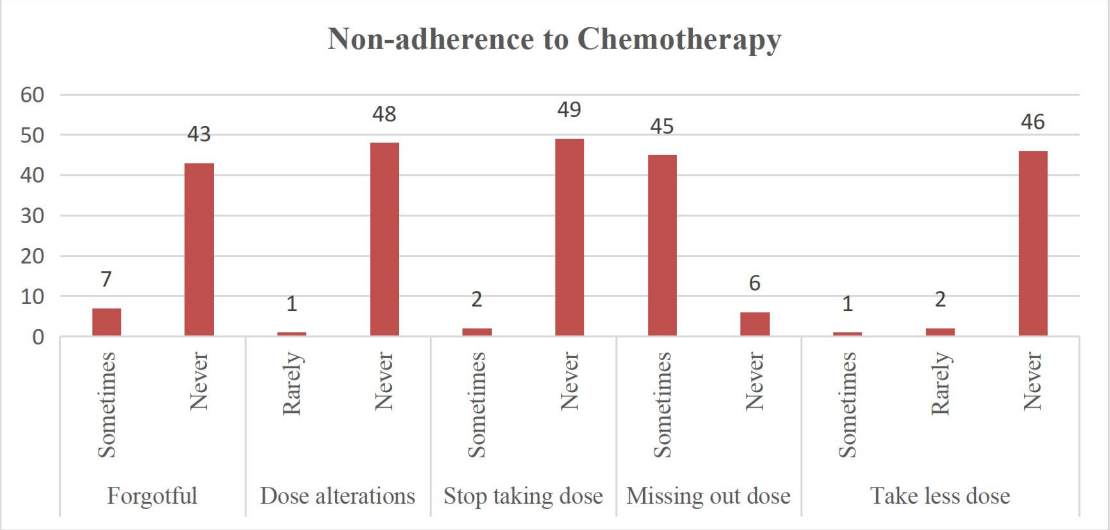


Figure 9;Non-adherence to Chemotherapy

4.4 Therapy Related Determinants of Non-adherence to Chemotherapy among Breast Cancer patients

4.4.1 Mode of Administration

Mode of administration of chemotherapy had a significant association with of non-adherence to chemotherapy among breast cancer patients ($\chi 2 = 51.0$; $p<0.05$).

Table 8: relationship between mode of administration and non-adherence to chemotherapy

	miss out a dose			
Mode of administration	**Sometimes**	**Never**	**Chi-square value**	**p-value**
Orally	0	9	51.000	0.000
Injected	45	0		

4.4.2Duration of Treatment

Duration of the chemotherapy treatment had no significant association with of non-adherence to chemotherapy among breast cancer patients ($\chi 2 = 0.38$; $p>0.05$).

Table 9: relationship between duration of treatment and non-adherence

	miss out a dose			
Mode of administration	**Sometimes**	**Never**	**Chi-square value**	**p-value**
Yes	21	2	0.38	0.538
No	24	4		

4.4.3Affordability

The study results showed that affordability of the thermotherapy treatment had no significant association with of non-adherence to chemotherapy among breast cancer patients ($\chi 2= 1.428$; $p>0.05$).

Table 10: relationship between affordability and non-adherence to chemotherapy

	miss out a dose			
Affordability	**Sometimes**	**Never**	**Chi-square value**	**p-value**
Yes	43	5	1.428	0.232
No	2	1		

4.5 Hospital Related Determinants of Non-adherence to Chemotherapy among Breast Cancer Patients

This study sought to establish the hospital related determinants of non-adherence to chemotherapy among breast cancer patients. Patient related determined examined include, inaccessibility to cancer treatment, nature of patient-provider relationship, timing of clinic schedule, and availability of medicine

4.5.1 Inaccessibility to Cancer Treatment

The study results showed that inaccessibility to cancer treatment had a significant association with non-adherence to chemotherapy among breast cancer patients ($\chi 2$= 23.528; p<.05).

Table 11: relationship between inaccessibility to Cancer Treatment and non-adherence to chemotherapy

Inaccessibility to cancer treatment	**miss out a dose**			
	Sometimes	**Never**	**Chi-square value**	**p-value**
Yes	3	5	23.528	.000
No	42	1		

4.5.2Nature of Patient-Provider Relationship

Nature of Patient-provider relationship had no significant association with non-adherence to chemotherapy among patients diagnosed with breast cancer ($\chi 2$= 1.599; p>.05).

Table 12: relationship between nature of Patient-Provider relationship and non-adherence to chemotherapy

Nature of Patient-Provider Relationship	**miss out a dose**			
	Sometimes	**Never**	**Chi-square value**	**p-value**
Excellent	2	1	1.599	0.449
Good	40	5		
Not good and not bad	2	0		

4.5.3Timing of Clinic Schedule

Timing of the clinic schedule showed that had no significant association with non-adherence to chemotherapy among patients diagnosed with breast cancer ($\chi 2= 2.932$; $p>.05$).

Table 13: relationship between Timing of Clinic Schedule and relationship and n0n-adherence to chemotherapy

Timing of Clinic Schedule	**miss out a dose**			
	Sometimes	**Never**	**Chi-square value**	**p-value**
Yes No	1 44	1 5	2.932	0.087

4.5.4Availability of Medications

Availability of medications showed that had a significant association with non-adherence to chemotherapy among patients diagnosed with breast cancer ($\chi 2= 27.824$; $p<.05$).

Table 14: relationship between availability of medications and non-adherence to chemotherapy

Availability of Medicine	**miss out a dose**			
	Sometimes	**Never**	**Chi-square value**	**p-value**
Yes No	2 43	5 1	27.824	.000

4.6 Chapter summary

This chapter has presented the data analysis and results. The study sought to determine the patient related determinants, therapy related determinants, and hospital related determinants of non-adherence to chemotherapy among patients diagnosed with breast cancer attending Kenyatta National Hospital's oncology clinic. The study results showed that among patient related determinants; age, gender and education levels have a significant association with adherence to chemotherapy. Findings on therapy related determinants showed that mode of administration had a significant association with breast cancer patient non-adherence to chemotherapy treatment dose. Findings on hospital related determinants revealed that inaccessibility to cancer treatment and availability of medicine had a significant association with non-adherence to chemotherapy treatment dose

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATION

5.1 Introduction

This chapter presents a discussion of the study results guided by study questions. The aim of this study was to assess the determinants of non-adherence to chemotherapy among breast cancer patients. It also presents the conclusions and recommendations drawn from the study results.

5.2 Discussion

5.2.1 Patient Related Determinants of Non-adherence to Chemotherapy among Breast Cancer patients

This study sought to establish the patient-related determinants of non-adherence to chemotherapy among breast cancer patients.

5.2.1. Age

The study results showed that age had significant determinants of non-adherence to chemotherapy ($\chi 2= 5.583$; $p<0.05$). Most of the patients were between the ages of 30-40 years (28%) and the ages of 40-50 years (48%). The two age groups formed approximately three quarter of the total patients sampled with combined percentages of 76%. Contrary to the results, Bright et al. (2016) observed poorer adherence levels to treatment among older breast cancer patients compared to their younger counterparts and hence concluded that increasing age was a predictor of non-adherence to treatment among this patient population. This was also the case with Gambalunga et al. (2018) who also reported decreasing adherence to treatment with increasing age among patients diagnosed with breast cancer.

The poorer adherence rates among these age groups were probably because of forgetfulness, frailty, poor support from family, and their increased to drug-related side effects.

5.2.2 Gender

The study results showed that gender has significant association with non-adherence to chemotherapy among patients diagnosed with breast cancer ($\chi 2= 0.136$; $p<0.05$). Similarly to the study results, Siegel RL et al (2018) in their studies observed that more females non-adhere to chemotherapy because females tend to experience more adverse reactions than males hence they opt to miss treatment. Another study done by Chen et al (2014) revealed that male patients adhere more effectively to medications than female patients do, factors associated with adherence in male patients included less casual attribution to culture, fewer symptoms and uncertain symptoms.

The poorer adherence rates among females breast cancer patients were because they are care takers of the family as a result they may forget to take good care of themselves and also may lack support.

5.2.3 Marital status

Marital status showed no significant determinant of non-adherence to chemotherapy among patients diagnosed with breast cancer($\chi 2= 0.436$; $p>0.05$): in contrast to the findings, Muluneh et al. (2018) and Puts et al. (2014) in their studies observed that being married was a positive predictor of better adherence to treatment among their participants. These studies attributed the higher adherence rates to treatment among married breast cancer patients to the social, psychological, and emotional support that the patients received from their spouses including help in form of reminders on when to take medication.

Similarly, Montagna et al. (2021) noted that better adherence rates to treatment were reported among married breast cancer patients compared to their unmarried counterparts

5.2.4 Education level

The study results show that education level has significant determinant of non-adherence to chemotherapy ($\chi 2= 3.148$; $p<0.05$); similar with these findings, Ross et al. (2020) identified low education background as a significant factor that influenced non-adherence to oral antineoplastic drugs among surveyed breast cancer patients.

Similarly, studies by Finitsis et al. (2019) and Yusufov et al. (2021) also cited illiteracy to be a major risk factor for non-adherence to prescribed therapies among patients diagnosed with breast cancer, sentiments also shared by Greer et al. (2016) and Kumar et al. (2020).

The low adherence rates to treatment among breast cancer patients with low education background were linked to their lack of or poor understanding of treatment-related instructions and their possible low appreciation of the significance of using treatment to their health and well-being.

5.2.5 Household income

Findings showed that household income has no significant determinant of non-adherence to chemotherapy among breast cancer patients ($\chi 2= 4.366$; $p>.05$). contrast with study results, Ingwu et al. (2019) observed in their study evaluating the predictors of non-adherence to chemotherapy treatment among patients diagnosed with breast cancer in Nigeria, that poor adherence to chemotherapy was established to positively correlate with patients' low household income status.

Further, Clancy et al. (2020) while reviewing the adherence to chemotherapy treatment experiences among patients diagnosed with breast cancer, also cited patients' household income status as one of the variables that influenced their treatment-adherence levels. In a similar perspective, in studies were done by Bouwman et al. (2017) and Gambalunga et al. (2018), poverty or low household income status was identified as a major factor contributing to low compliance rates with treatment among surveyed breast cancer patients.

The results are contrary to the literature maybe because of NHIF cover, a health insurance in Kenya which covers medical services including chemotherapy treatment.

5.3 Therapy Related Determinants of Non-adherence to Chemotherapy among Patients Diagnosed with Breast Cancer

This study sought to establish the therapy-related determinants of non-adherence to chemotherapy among breast cancer patients.

5.3.1 Mode of administration

The study results showed that the mode of administration had a significant association with breast cancer patient non-adherence to chemotherapy treatment dose ($\chi 2= 51.00$; $p<.05$). In line with findings, studies done by Tan et al. (2021) and Yusufov et al. (2021) on the mode of chemotherapy administration reported higher adherence rates to treatment among patients whose medication was orally administered in form of pills compared to those whose medication was administered through the injection mode. Similar findings were reported by Toivonen et al. (2020) who established oral administration of cancer medication as being associated with better adherence to treatment compared to other hospital-based modes of administration such as intravenous modes. Further, Murphy et al. (2021) and Spencer et al. (2020) in their studies noted that the greater the ease and flexibility of a given mode of medication administration, the higher the likelihood of better compliance levels to the treatment and vice-versa.

This is maybe the patients find it easy to take oral chemotherapy and also they take drugs at home at their convenient time. It may also be patients worried and afraid of pain once they have been injected. They may also find that injectable chemotherapy have serious side effects

5.3.2 Duration of treatment

The study results revealed that the duration of treatment ($\chi 2= 0.38$; $p>.05$) did not show a significant association with non-adherence to chemotherapy treatment doses.

Parallel to these findings, Sella and Chodick (2020) noted that higher treatment adherence levels were seen among patients under short-term treatment regimens compared to those under long-term forms of treatment. Similarly, Wako et al. (2022) established the long-term nature of cancer treatments as a major barrier to treatment adherence among surveyed women who had breast cancer. In addition, contrary to the findings, Bright, et al. (2016) and Gambalunga et al. (2018) also pointed to the long-term duration of chemotherapy regimens as one of the factors contributing to low treatment adherence rates among patients diagnosed with breast cancer. The association between long treatment duration and higher treatment non-adherence rates among breast cancer patients was largely attributed to a phenomenon referred to as '*treatment fatigue*' in which patients become tired and disoriented from following a prescribed therapy over a prolonged time.

5.3.3 Affordability

The study results showed that affordability ($\chi 2 = 1.428$; $p > .05$) did not show a significant association with non-adherence to chemotherapy treatment doses. Contrary to the results, Ingwu et al. (2019) identified the high cost of chemotherapy treatment of N600,000 - N1.5 million compared to the basic wage of N30,000 as one of the leading factors that contributed to these patients' not adhering to the treatment. Similar findings were reported by Paranjpe et al. (2019) and Kumar et al. (2020) who established the average cost of chemotherapy in India of approximately Rs. 75,600 relative to the basic wage of about Rs. 176 is a leading barrier to breast cancer patients' adherence to the treatment.

In a similar observation, Bouwman et al. (2017) also cited the high cost of treatment for breast cancer as a major predictor of the low treatment compliance rates among affected patients. High chemotherapy treatment costs remain largely unaffordable to many of the cancer patients who need the treatment, particularly in low-resource countries and this contributes to treatment non- adherence.

This is contrary to the study results because many patients are on medical insurance cover called NHIF hence enhance adherence.

5.4 Hospital Related Determinants of Non-adherence to Chemotherapy among Breast Cancer Patients

This study sought to establish the hospital-related determinants of non-adherence to chemotherapy among breast cancer patients.

5.4.1 Inaccessibility to cancer treatment

Findings showed that inaccessibility to cancer treatment had a significant association with non-adherence to chemotherapy treatment dose ($\chi 2= 23.528$; $p<.05$). Findings showed that inaccessibility to cancer treatment had a significant association with non-adherence to chemotherapy treatment dose ($\chi 2= 23.528$; $p<.05$). In line with these results, Bright et al. (2016) argued that few breast cancer chemotherapy treatment centers and their concentration mainly in large urban centers also impeded accessibility treatment among breast cancer patients who resided in rural and remote areas of US. Similarly, Krikorian et al. (2019) noted that poor accessibility of chemotherapy treatment owing to few treatment centers and their biased location in relatively higher income or urbanized areas was one of the leading challenges that adversely influenced adherence to chemotherapy among patients diagnosed with breast cancer, particularly those who resided in rural and remote areas.

Further, Lambert et al. (2018), Moon et al. (2019) and Skrabal Ross et al. (2020) in their studies found that the requirement for patients with breast cancer to travel long distances, usually at considerable costs/expense in the face of huge financial constraints, to access chemotherapy treatment centers often led to their non-adherence with the treatment.

The inaccessibility of cancer treatment maybe because of few chemotherapy centres in the country. Many patients come from far; as a result each and every visit they need money to cover the cost hence opted to miss doses of chemotherapy

5.4.2 Availability of medications

Availability of medications had a significant association with non-adherence to chemotherapy treatment dose ($\chi 2 = 27.824$; $p < .05$). In congruence with the results, Paranjpe et al. (2019), Kumar et al. (2020) and Wako et al. (2022) in their studies noted that the unavailability of cancer medications, particularly in rural local settings. Hence forcing these patients to either miss the treatment or to travel long distances in search of the treatment, was a major factor that contributed to poor treatment adherence among the surveyed patients. In correspondence with the findings, Clancy et al. (2020) noted that the low availability of cancer drugs in local health centers hence requiring the patients to travel long distances to find the treatment did significantly impede these patients' compliance with prescribed treatment.

This happens when chemotherapy is out of stock at KNH hence patients are sent back or told to buy if they have money. Those who have no money they miss doses.

5.4.3 The timing of clinic schedule

The timing of schedules did not have a significant association with non-adherence to chemotherapy treatment dose ($\chi 2 = 2.932$; $p > .05$). In contrast to these findings, Chlebowski et al. (2019) and Kumar et al. (2020) in their studies revealed that breast cancer patients who received weekly chemotherapy sessions were adhered better to treatment compared to those on monthly chemotherapy sessions. The better adherence in shorter chemotherapy cycles was attributed to regular patient-HCP contacts which offered a better opportunity for the HCPs to monitor and constantly remind the patients of the importance of strict observance of the prescribed therapy. Similarly, Gast and Mathes (2019) and Muluneh et al. (2018) in their studies discovered better adherence to chemotherapy treatment among breast cancer patients with shorter chemotherapy cycles marked by one or two chemotherapy sessions each week compared to those with longer cycles requiring a single or few chemotherapy sessions each month. Generally, a more flexible and patient-conscious chemotherapy clinic schedule correlates with better compliance with treatment among surveyed breast

cancer patients while a more rigid clinic schedule relates to higher levels of non-compliance to the treatment module.

Many patients in this study were happy maybe because they were receiving chemotherapy drugs 3 weeks apart hence make their body to gain the strength and some side effects resolve during the break.

5.4.4 The nature of patients-provider relationship

The nature of patient-provider relationship also did not have a significant association with non-adherence to chemotherapy treatment dose ($\chi 2 = 2.932$; $p > .05$). Parallel to these findings, Clancy et al. (2020) and Murphy et al. (2021) in their studies showed that a positive and constructive interaction between breast cancer patients and their care providers in the form of mutual respect, shared decision-making and regular, open communication regarding the patient's health status, led to better compliance with treatment among the surveyed breast cancer patients. In a similar perspective, Toivonen et al. (2020) and Tan et al. (2021) in their studies discovered that poor patient-healthcare providers relations characterized by poor communication, lack of trust, and HCPs' lack of empathy, as contributing to poor adherence to chemotherapy treatment among surveyed patients with breast

5.5 Conclusion

This study concluded that among patient related factors, age, gender and education level have significant association with non-adherence to chemotherapy.

Among therapy related determinants, mode of administration has a significant association with non-adherence to chemotherapy among patients diagnosed with breast cancer

It was also concluded that among hospital related determinants, inaccessibility to cancer treatment and availability of medications are significant associated with non-adherence to chemotherapy treatment.

5.6 Recommendations

The recommendations of this study can be summed up based on the WHO guideline which characterizes 'Adherence' as a multidimensional phenomenon composed of patient, disease/condition, therapy, health systems and social economic factors (WHO, 2014)

I Patient related determinants of non-adherence

This study recommends close monitoring to female patients in order to prevent treatment disruptions. Further research studies should be done to ascertain the reasons why female patients and certain age groups show high non-adherence to chemotherapy

II Therapy related determinants of non-adherence

This study recommends that each and every visit patients should be reminded of side effects of chemotherapy, duration of treatment, mode of administration and attending any issues raised by the patients concerning the chemotherapy treatment

III Hospital related determinants non-adherence

This study recommends that the healthcare system should establish appropriate models/centres that would facilitate breast cancer patients to easily access chemotherapy treatment.

Hospitals should stock enough chemotherapy medications to avoid situation where patients are turned away due to lack of chemotherapy drugs. NHIF can also be used to buy chemotherapy drugs outside KNH once the Oncology clinic is run out of chemotherapy medications

More cancer centers should be set up at county levels and properly equipped and staffed to prevent movement of persons from counties to KNH to receive chemotherapy. This would bring down the problem of inaccessibility to treatment hence improve non-adherence.

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APPENDICES

Appendix 1: Participants' Informed Consent Form

Title of Study: Determinants of non-adherence to chemotherapy among patients diagnosed with breast cancer attending oncology clinic at Kenyatta National Hospital

Principal Investigator\and institutional affiliation: Patricia Sumati, University of Nairobi

Supervisors: Dr. Irene Mageto &Dr. Eunice Omondi, University of Nairobi

Introduction

My name is Patricia Sumati student at the University of Nairobi pursuing a Masters of Science Degree in Oncology Nursing. I am carrying out a research study on: determinants of non-adherence to chemotherapy among patients diagnosed with breast cancer attending oncology clinic at Kenyatta National Hospital.

Purpose of the study

The purpose of this study is to assess the determinants of non-adherence to chemotherapy among patients diagnosed with breast cancer attending oncology clinic at Kenyatta National Hospital.

Research description

I am requesting for your participation in this study by giving your views and opinions on the research subject through responding to the study tool. Before you can respond to the study tool, you will be required to offer your informed consent to take part in this study. Both your consent and response to the study tool will be written. The questions you will respond to seek to gather information on any patient, therapy and hospital related factors hindering you from effectively adhering to chemotherapy treatment, in line with the study objectives.

Confidentiality

All information provided will be handled and processed with utmost confidentiality. All information given herein will only be used for purposes of the research study. Your name or anything else that may identify you will not appear anywhere in the study.

Autonomy

This will be observed by ensuring that participants make their own choices about their own thoughts, intentions, and actions. In this study, only willing respondents will be recruited to participate in the study. The identity of all respondents will be kept anonymous by ensuring the use of codes and not names or any personal identifiers. Participation in the study will be on a voluntary basis and participant's thoughts**,** wishes and actions will be respected at all times.

Right of withdrawal

Should you feel/wish to terminate your participation in this study, you have the right to do so at any time without facing any consequences/penalties.

Benefit

This research work is for academic purposes only and if you agree to participate, the information that you will provide will be of great importance in informing development of necessary strategies and interventions to improve adherence to chemotherapy treatment among patients diagnosed with breast cancer at KNH. However, there will be no monetary gains or any other form of payment for participating.

Risks

There is no any intended health risk or any other harm to participants for participating in this study. However, in the event that the study participant suffers emotional or psychological distress for participating in this study, the researcher will refer them to

a counselor for appropriate help. The researcher has liaised with the Counselling Unit within KNH's Oncology Clinic that has expressed readiness and willingness to provide counselling services to any participants who may be in need. Therefore, participants that will experience any emotional and/or psychological distress will be linked with the Counselling Unit at KNH's Oncology Clinic for appropriate help.

Contacts

For any queries regarding this research study, kindly contact;

Principal researcher: Patricia Sumati, Cell: 0714527 880, Email: psumati@students.uonbi.ac.ke

OR

Principal supervisor: Dr. Irene G. Mageto, Cell: 0724 205419, Email: igmageto@uonbi.ac.ke

OR

Secretary, Ethics and Research Committee of KNH/UON, Telephone: 020-2726300, Email: uonknh_erc@uonbi.ac.ke, P.O. Box 19676 - 00202Nairobi

Respondent's Declaration

I have been fully informed about the nature of the study, I know the benefits, and understand that there are no risks involved. I hereby give my consent to participate in this study.

Signature of participant ……. Date …….

Researcher's Declaration

I have fully disclosed all the relevant information concerning this study to the study respondent.

Signature of researcher ……. Date ……

Appendix 2: Fomu ya Utoaji wa Idhini ya Kushiriki

Kichwa cha Utafiti: Mambo yanayochangia kutofuata matibabu ya chemotherapy miongoni mwa wagonjwa wa saratani ya matiti wanaohudhuria kliniki ya saratani katika Hospitali Kuu ya Kenyatta

Mtafiti mkuu\nataasisi shiriki: Patricia Sumati, Chuo Kikuu cha Nairobi

Wasimamizi: Dkt. Irene Mageto na Dkt. Eunice Omondi, Chuo Kikuu cha Nairobi

Utangulizi

Jina langu niPatricia Sumatimwanafunzi katika Chuo Kikuu cha Nairobi. Ninafanya masomo ya Shahada ya Uzamili ya Sayansi katika Uuguzi wa Saratani. Hivyo basi, ninafanya utafitikuhusu mambo yanayochangia kutofuata matibabu ya chemotherapy miongoni mwa wagonjwa wa saratani ya matiti wanaohudhuria kliniki ya saratani katika Hospitali Kuu ya Kenyatta.

Lengo la utafiti

Kusudi la utafiti huu ni kutathminimambo yanayochangia kutofuata matibabu ya chemotherapy miongoni mwa wagonjwa wa saratani ya matiti wanaohudhuria kliniki ya saratani katika Hospitali Kuu ya Kenyatta.

Maelezo ya utafiti

Ninaomba kushiriki kwako katika utafiti huu kwa kutoa maoni yako kuhusu hoja/swala linalochunguzwa kupitia kutoa majibu kwa dodoso la utafiti huu. Ikiwa utashiriki, mtafiti atakuuliza ujibu maswali kadhaa kulingana na malengo ya utafiti.

Usiri

Habari zote utakazotoa zitashughulikiwa kwa usiri mkubwa. Habari hizo zitatumika tu kwa madhumuni ya utafiti huu. Jina lako au taarifa zingine zozote zinazoweza kukutambulisha hazitaonekana popote kwenye utafiti.

Ushiriki wa hiari

Kushiriki kwako katika utafiti huu ni kwa hiari yako binafsi bila kulazimishwa.

Haki ya kujiondoa

Iwapo utajihisi kusitisha ushiriki wako katika utafiti huu, una haki ya kufanya hivyo wakati wowote na hakutakuwa na athari yoyote.

Faida

Utafiti huu ni kwa ajili ya kujiendeleza kielimu na hivyo basi ikiwa utashiriki kwenye utafiti huu, habari zote utakazotoa zitaarifu uundaaji wa mikakati na hatua muhimu za kuimarisha na kuboresha ufuataji wa matababu ya chemotherapy miongoni mwa wagonjwa wa saratani ya matiti wanaohudhuria kliniki ya saratani katika Hospitali Kuu ya Kenyatta. Hata hivyo, hakutakuwa na faida ya malipo ya kushiriki.

Hatari

Hakukusudiwi kuwa kutakuwa na hatari yoyote kwako kwa kushiriki katika utafiti huu. Hata hivyo, ukiwa utapata matatizo yoyote ya kihisia na kisaikolojia, basi mtafiti atakuelekeza kwa mshauri wa kisaikolojiakwa usaidizi ufaao.

Mawasiliano

Kwa maswali yoyote kuhusu utafiti huu, tafadhali wasiliana na;

Mtafiti mkuu: Patricia Sumati, Simu: 0714527 880, barua pepe: psumati@students.uonbi.ac.ke

au

Msimamizi mkuu: Dkt. Irene G. Mageto, Simu: 0724 205419, barua pepe: igmageto@uonbi.ac.ke

au

Katibu, Kamati ya maadili na utafiti ya KNH na UoN, Simu: 020-2726300 Ugani 44355, barua pepe: uonknh_erc@uonbi.ac.ke, sanuku la posta: P.O. Box 19676 – 00202 Nairobi

Tamko la mshiriki

Nimefahamishwa kikamilifu kuhusu utafiti huu, naelewa manufaa yake na naelewa kuwa hakuna hatari yoyote itokanayo na kushiriki katika utafiti huu. Hivyo basi, natoa idhini yangu kushiriki katika utafiti huu.

Sahihi ya mshiriki ……. Tarehe …….

Tamko la mtafiti

Nimetoa maelezo yote muhimu kuhusiana na utafiti huu kwa mshiriki.

Sahihi ya mtafiti ……. Tarehe ……

Appendix 3:Questionnaire

Study title: Determinants of non-adherence to chemotherapy among patients diagnosed with breast cancer attending oncology clinic at Kenyatta National Hospital

Code ……. **Date** …….……..

Instructions;

- Do not write your name or any personal identification on the questionnaire.
- Answer all the questions by putting a tick (√) in the preferred box.
- Information obtained will be handled and processed in strict confidence.

Section A: Patient related determinants

1. What is your gender? Male ( ) Female ( )

2. What is your age (in completed years)? ….……

3. What is your education level?

No formal education ( ) Primary education ( )

Secondary education ( ) Tertiary education ( )

4. What is your marital status?

Single ( ) Married ( ) Separated ( )

Divorced ( ) Widowed ( )

5. What do you do for livelihood? ……..…….……

6. What is the approximate monthly income of your family? …….

7. Where do you live? ……

8. In your view, do you think chemotherapy is highly helpful to your health condition?

Yes ( ) No ( )

If yes, kindly elaborate

……
……
……

If no, why?

……
……
……

Section B: Non-adherence to chemotherapy

9. With respect to your prescribed chemotherapy treatment, indicate how often you do the following treatment related activities. Use a scale of 1 - 5 where 1 - always, 2 - often; 3 - sometimes; 4 - rarely; 5 - never.

Item	Always	Often	Sometimes	Rarely	Never
I forget to take them	1	2	3	4	5
I alter the dose	1	2	3	4	5
I stop taking them for a while	1	2	3	4	5
I decide to miss out a dose	1	2	3	4	5
I take less than instructed	1	2	3	4	5

Section C: Therapy related determinants

10. For how long have been under chemotherapy treatment? ……

11. Which is the mode of administration of the chemotherapy drugs you are currently using?

Orally ( ) Injection ( )

Others (indicate) ……

12. Indicate the number of chemotherapy sessions you undergo every month?

……..…

13.

a) Do you experience any adverse side effects from the chemotherapy medications you use?

Yes ( ) No ( )

b) If yes, which ones (specify)

……
……
……

14. Has the duration you have been undergoing chemotherapy treatment influence your adherence to the treatment?

Yes ( ) No ( )

If yes, in which ways?

……
……
……

15.

a) Do you experience financial strain in meeting the cost of your treatment?

Yes ( ) No ( )

b) If yes, does it impede your adherence to the chemotherapy treatment?

Yes ( ) No ( )

Kindly elaborate

……
……

Section D: Hospital related determinants

16. Are the chemotherapy medications you use readily available?

Yes ( ) No ( )

17. Have you had any problems accessing your prescribed chemotherapy drugs?

Yes ( ) No ( )

Kindly elaborate your answer

……
……
……

18. If any, has treatment accessibility problems impeded your adherence to prescribed treatment?

Yes ( ) No ( )

If yes, kindly elaborate

……
……
……

19. How would you rate your relationship with the health care providers who serve you when you seek treatment?

Excellent ( ) Good ( )

Not good and not bad ( ) Poor ( )

Very poor ( )

Kindly elaborate your response

……
……
……

20. In which ways does your relationship with the medical care team influence your adherence to the chemotherapy treatment?

……
……
……

21.

a) Do you have a problem with the timing of your chemotherapy clinic schedules?

Yes ( ) No ( )

b) If yes, kindly explain why?

……
……
……..

b) Does your chemotherapy clinic schedules impede your adherence to the prescribed treatment?

Yes ( ) No ( )

If yes, in which ways (kindly elaborate)

……
……
……

22. What other challenges impede your adherence to the prescribed chemotherapy regimen?

……
……
…….

End

Thank you

Appendix 4: Dodoso

Kichwa cha utafiti: Mambo yanayochangia kutofuata matibabu ya chemotherapy miongoni mwa wagonjwa wa saratani ya matiti wanaohudhuria kliniki ya saratani katika Hospitali Kuu ya Kenyatta

Nambari……. **Tarehe** …….……..

Maagizo;

- Usiandike jina lako au kitambulisho chochote cha kibinafsi kwenye dodoso.
- Jibu maswali yote kwa kuweka tiki (√) kwenye kisanduku unachopendelea.
- Taarifa zitakazopatikana zitashughulikiwa na kushughulikiwa kwa usiri mkubwa.

Sehemu ya A: Viashiria vinavyohusiana na mgonjwa

1. Jinsia yako ni gani? Kiume ( ) Kike ( )

2. Je, umri wako, kimiaka, ni ngapi? ….……

3. Kiwango chako cha elimu ni kipi?

Sina elimu rasmi ( ) Elimu ya msingi ( )

Elimu ya upili ( ) Elimu ya chuo ( )

4. Hali yako ya ndoa ni ipi?

Sijaoa/sijaolewa ( ) Nimeoa/nimeolewa ( )

Tuliachana ( ) Tulitalakiana ( )

Nimefiwa ( )

5. Unafanya nini ili kupata riziki? ……..…….……

6. Mapato ya familia yako ya kila mwezi, kwa wastani, ni? …….

7. Unaishi wapi? ……

8. Je, kwa mtazamo wako, unafikiri matibabu ya chemotherapy yana manufaa kwa hali yako?

Ndio ( ) La ( )

Ikiwa nindio, tafadhali fafanua

……
……
……

Ikiwa ni la, kwa nini?

……
……
……

Sehemu ya B: Kutofuata matibabu ya chemotherapy

9. Kuhusiana na matibabu unayopokea ya chemotherapy, onyesha ni mara ngapi unafanya shughuli zifuatazo zinazohusiana na matibabu hayo. Tumia kipimo cha 1 - 5 ambapo 1 -kila wakati, 2 -mara nyingi; 3 -wakati mwingine; 4 -mara chache; 5 - sio kamwe.

Kipengee	Kila wakati	Mara nyingi	Wakati mwingine	Mara chache	Sio kamwe
Nasahau kuzikunyua	1	2	3	4	5
huwa nabadilisha dozi	1	2	3	4	5
huwa naacha kuzikunyua kwa muda	1	2	3	4	5
huwa naamua kukosa dozi	1	2	3	4	5
huwa nakunywa idadi ya chini kuliko ilivyoelekezwa	1	2	3	4	5

Sehemu ya C: Viashiria vinavyohusiana na matibabu

10. Ni kwa muda gani umekuwa chini ya matibabu ya chemotherapy?

……

11. Matibabu unayopata ya dawa za chemotherapy unayapata kwa njia ipi?

Kwa kinywa ( ) Kwa njia ya sindano ( )

Njia zingine (taja) ……

12. Idadi ya vipindi vya chemotherapy unavyovipitia kila mwezi ni ngapi?

……..…

13.

a) Je, unapata madhara yoyote kutoka kwa dawa za chemotherapy unazozitumia?

Ndio ( ) La ( )

b) Ikiwa nindio, ni madhara yepi unayopata (taja)

……
……
……

14. Je, muda ambao umekuwa ukipata matibabu ya chemotherapy huathiri ufuatiliaji wako wa matibabu hayo?

Ndio ( ) La ( )

Ikiwa ni ndio, kwa njia zipi?

……
……
……

15. Je, ugonjwa wa saratani ya matiti unaougua uko kwenye kiwango kipi?

Cha kwanza ( ) Cha pili ( ) Cha tatu ( ) Cha nne ( )

16.

a) Je, unapata matatizo ya kifedha katika kukidhi gharama ya matibabu yako?

Ndio ( ) La ( )

b) Ikiwa nindio, je matatizo haya ya kifedha huchangia kutofuata kwako kwa matibabu yachemotherapy?

Ndio ( ) La ( )

Tafadhalifafanua

……
……

Sehemu ya D: Viashiria vinavyohusiana nahospitali

17. Je, dawa unazozitumia za chemotherapy zinapatikana kwa urahisi?

Ndio ( ) La ( )

18. Je, umekuwa na changamoto zozote katika kupata dawa za chemotherapy ulizoagiziwa?

Ndio ( ) La ( )

Tafadhali fafanuajibu lako

……
……
……

19. Iwapo yapo, matatizo ya upatikanaji wa matibabu yamezuia ufuatiliaji wako wa matibabu uliyoagiziwa?

Ndio ( ) La ( )

Ikiwa nindio, tafadhali fafanua

……
……
……

20. Je, unaweza kukadiria vipi uhusiano wako na wahudumu wa afya wanaokuhudumia unapotafuta matibabu?

Bora zaidi ( ) Mzuri ( )

Sio mzuri na sio mbaya ( ) Mbaya ( )

Mbaya kabisa ( )

Tafadhali fafanua jibu lako

……
……
……

21. Ni kwa njia zipi uhusiano wako na wahudumu wa afya wanaokuhudumia huathiri ufuatiliaji wako wa matibabu ya chemotherapy?

……
……
……

22.

a) Je, una tatizo na muda wa ratiba zako za kliniki za chemotherapy?

Ndio ( ) La ( )

b) Ikiwa ni ndio, tafadhali eleza kwa nini?

……
……
……..

b) Je, mpangilio wa ratiba zako za kliniki za matibabu ya chemotherapy huathiri ufuatiliaji wako wa matibabu haya?

Ndio ( ) La ( )

Ikiwa nindio, kwa njia zipi (tafadhalifafanua)

……
……
……

23. Je, ni changamoto zipi zingine zinazozuia ufuatiliaji wako mzuri wa matibabu ya chemotherapyuliyoagiziwa?

……
……
…….

Mwisho

Asante sana

Appendix 5:Letter to KNH-UoN Ethics and Research Committee

Patricia Sumati,

Reg. No.: H56/38469/2020,

Department of Nursing Sciences,

Faculty of Health Sciences,

University of Nairobi.

The Secretary,

KNH/UoN - Ethics and Research Committee,

P.O. Box 20723-00202,

Nairobi.

Dear Sir/Madam,

RE: <u>Approval To Conduct A Research Study</u>

My name is Patricia Sumati student at the University of Nairobi's Department of Nursing Sciences undertaking a Masters of Science Degree in Oncology Nursing. I am hereby requesting for your approval to carry out a research study on "determinants of non-adherence to chemotherapy among patients diagnosed with breast cancer attending oncology clinic at Kenyatta National Hospital", as a requirement in partial fulfillment for the award of the said degree.

Thank you in advance.

Yours faithfully,

Patricia Sumati

Appendix 6: Letter to the Head of Department -Oncology Unit of KNH

Patricia Sumati,

Reg. No.: H56/38469/2020,

Department of Nursing Sciences,

Faculty of Health Sciences,

University of Nairobi.

The Head of Department,

Oncology Unit - KNH,

Nairobi.

Dear Sir/Madam,

RE: <u>Authority To Carry Out A Research Study at KNH Oncology Clinic</u>

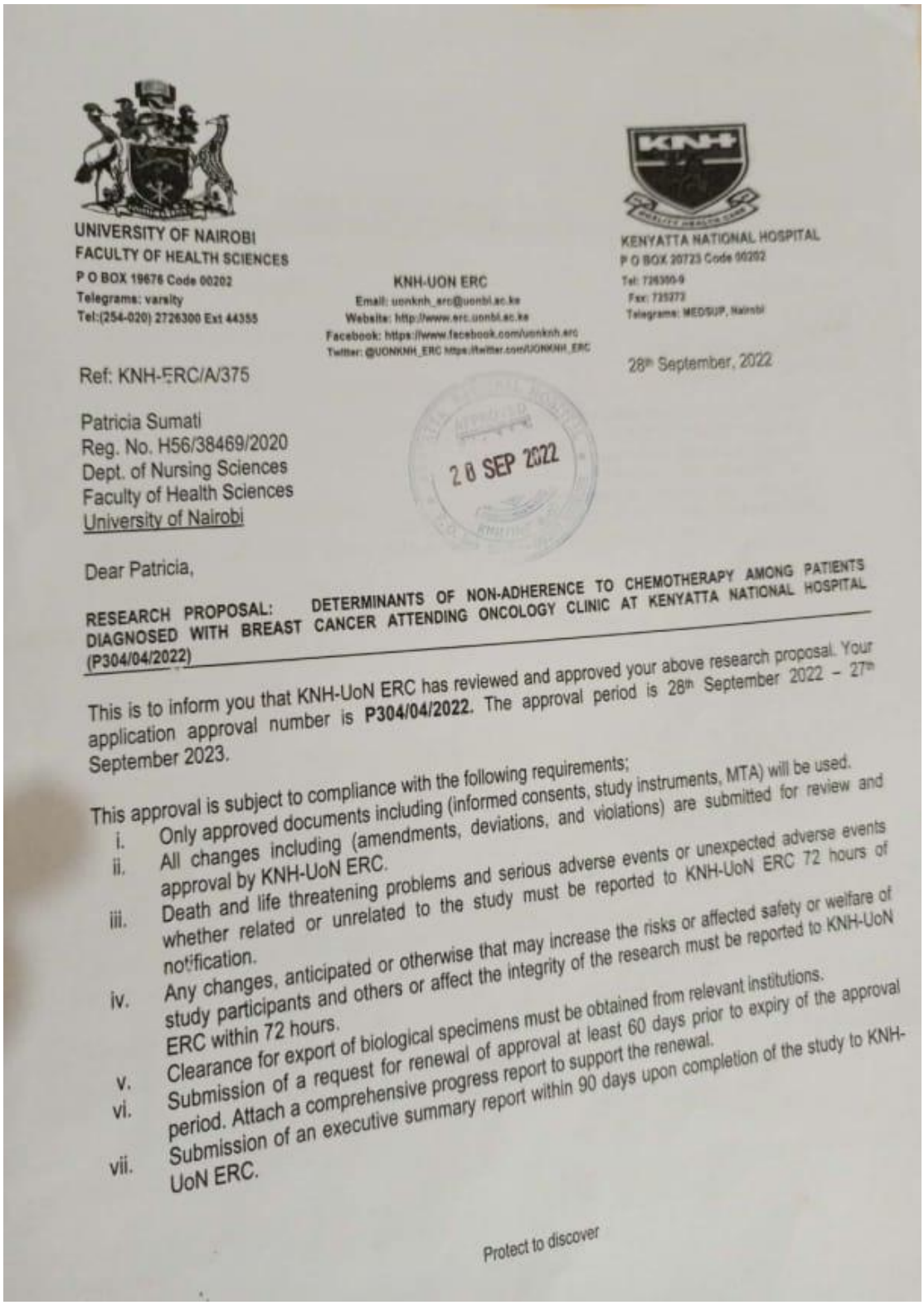
My name is Patricia Sumati student at the University of Nairobi's Department of Nursing Sciences undertaking a Masters of Science Degree in Oncology Nursing. I am undertaking a research study on "determinants of non-adherence to chemotherapy among patients diagnosed with breast cancer attending oncology clinic at Kenyatta National Hospital", as a requirement in partial fulfillment for the award of the said degree.

Iam therefore hereby requesting for your authorization to conduct data collection among patients diagnosed with breast cancer at the Oncology Clinic of KNH.

Yours faithfully,

Patricia Sumati

Appendix 7: Approval letter from Ethics and Research Committee



UNIVERSITY OF NAIROBI
FACULTY OF HEALTH SCIENCES
P O BOX 19676 Code 00202
Telegrams: varsity
Tel:(254-020) 2726300 Ext 44355

KNH-UON ERC
Email: uonknh_erc@uonbi.ac.ke
Website: http://www.erc.uonbi.ac.ke
Facebook: https://www.facebook.com/uonknh.erc
Twitter: @UONKNH_ERC https://twitter.com/UONKNH_ERC

KENYATTA NATIONAL HOSPITAL
P O BOX 20723 Code 00202
Tel: 726300-9
Fax: 725273
Telegrams: MEDSUP, Nairobi

Ref: KNH-ERC/A/375

28th September, 2022

20 SEP 2022

Patricia Sumati
Reg. No. H56/38469/2020
Dept. of Nursing Sciences
Faculty of Health Sciences
University of Nairobi

Dear Patricia,

RESEARCH PROPOSAL: DETERMINANTS OF NON-ADHERENCE TO CHEMOTHERAPY AMONG PATIENTS DIAGNOSED WITH BREAST CANCER ATTENDING ONCOLOGY CLINIC AT KENYATTA NATIONAL HOSPITAL (P304/04/2022)

This is to inform you that KNH-UoN ERC has reviewed and approved your above research proposal. Your application approval number is **P304/04/2022**. The approval period is 28th September 2022 – 27th September 2023.

This approval is subject to compliance with the following requirements;

i. Only approved documents including (informed consents, study instruments, MTA) will be used.
ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by KNH-UoN ERC.
iii. Death and life threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to KNH-UoN ERC 72 hours of notification.
iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to KNH-UoN ERC within 72 hours.
v. Clearance for export of biological specimens must be obtained from relevant institutions.
vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.
vii. Submission of an executive summary report within 90 days upon completion of the study to KNH-UoN ERC.

Protect to discover

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) https://research-portal.nacosti.go.ke and also obtain other clearances needed.

Yours sincerely,

DR. BEATRICE K.M. AMUGUNE
SECRETARY, KNH-UoN ERC

c.c. The Dean, Faculty of Health Sciences, UoN
The Senior Director, CS, KNH
The Assistant Director, Health Information Dept., KNH
The Chairperson, KNH- UoN ERC
The Chair, Dept. of Nursing Sciences, UoN
Supervisors: Dr. Irene G. Mageto, Dept. of Nursing Sciences, UoN
Dr. Eunice A. Omondi, Dept. of Nursing Sciences, UoN

Protect to discover

Appendix 8 Approval letter from Head of Oncology clinic

KNH/R&P/FORM/01

KENYATTA NATIONAL HOSPITAL
P.O. Box 20723-00202 Nairobi

Tel.: 2726300/2726450/2726565
Research & Programs: Ext. 44705
Fax: 2725272
Email: knhresearch@gmail.com

Study Registration Certificate

1. Name of the Principal Investigator/Researcher
   Patricia Sumati
2. Email address: psumati@students.uonbi.ac.ke Tel No. +254 714527830
3. Contact person (if different from PI)..........
4. Email address: .... Tel No. ....
5. Study Title
   Determinants of non-adherence to Chemotherapy among patients diagnosed with breast cancer attending Oncology clinic at Kenyatta National Hospital

[redacted]ent where the study will be conducted CTC
(Please attach copy of Abstract)

7. Endorsed-by KNH Head of Department where study will be conducted.

Name: DR C Nyongesa Signature [signature] Date 4/10/22

8. KNH UoN Ethics Research Committee approved study number P304/04/2022
   (Please attach copy of ERC approval)

9. I Patricia Sumati commit to submit a report of my study findings to the Department where the study will be conducted and to the Department of Medical Research.

Signature [signature] Date 04/10/2022

10. Study Registration number (Dept/Number/Year) CTC / 160 / 2022
    (To be completed by Medical Research Department)

11. Research and Program Stamp

[Stamp: KENYATTA NATIONAL HOSPITAL HEAD OF DEPARTMENT]
[Stamp: KENYATTA NATIONAL HOSPITAL 04 OCT 2022]

All studies conducted at Kenyatta National Hospital must be registered with the Department of Medical Research and investigators must commit to share results with the hospital.

Appendix 9: Research License from NACOSTI

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **434519**

Date of Issue: **21/November/2022**

RESEARCH LICENSE

This is to Certify that Miss.. Patricia Fexter Sumati of University of Nairobi, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Nairobi on the topic: Determinants of non-adherence to chemotherapy among patients diagnosed with Breast cancer attending oncology clinic at Kenyatta National Hospital for the period ending : 21/November/2023.

License No: **NACOSTI/P/22/21438**

434519

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

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See overleaf for conditions