

**ADHERENCE TO RADIATION THERAPY AMONG CERVICAL CANCER PATIENTS  
AT CANCER DISEASES HOSPITAL IN LUSAKA, ZAMBIA**

**By**

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I, **Dr. Patricia Katowa-Mukwato**, having supervised and read this dissertation is satisfied that this is the original work of the author under whose name it is being presented. I confirm that the work has been completed satisfactorily and approved for final submission.

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**CERTIFICATE OF APPROVAL**

The University of Zambia approves this dissertation on Adherence to Radiation Therapy treatment among cervical cancer patients at Cancer Diseases Hospital in Lusaka Zambia in a partial fulfillment of the Master Science Degree in Clinical Nursing.

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**Examiner II**

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**Examiner III**

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## **ABSTRACT**

**Background:** Radiation therapy has the potential to improve the cure rates and provide palliative relief for cervical cancer patients. Despite adherence to radiation therapy being a key treatment modality, patients rarely follow prescriptions. Poor adherence to radiation therapy is associated with low survival rates and high mortality rates. This study therefore sought to investigate the levels of adherence and factors influencing adherence to radiation therapy among cervical cancer patients being treated at Cancer Diseases Hospital.

**Methods:** A cross-sectional analytical study design was used, 142 patients were selected from the Out-patient department using a fishbowl sampling method. A structured interview schedule was used to collect data. Data was entered and analyzed using SPSS, the binary logistic regression was used to predict levels of adherence to treatment as well as to identify factors associated with adherence to RT among cervical cancer patients.

**Results:** The findings showed that, 93% of the participants adhered to radiation therapy and only 7% had not adhered to treatment. Majority of the patients 77.1% had experienced side effects of radiation therapy. About 28% of patients had severe psychological distress. Using binary logistic regression there was a statistically significant association between adherence and perceived quality of health care services ( $p = 0.001$ ). The analysis showed that patients who perceived poor quality of health care services were 0.005 (99.5%) times less likely to adhere to radiation therapy. The other independent variables were not statistically significant despite being associated to adherence among cervical cancer patients.

**Conclusions and recommendations:** The findings showed that patients who perceived good quality of health care services had higher chances of adherence compared to those who perceived poor quality of health care services. There is therefore need for quality service provision which could include good maintenance of radiation machines. Furthermore there is need to develop guidelines for follow up in case of any disease outbreak to avoid interference with patient's treatment schedules and appointments for reviews.

**Key words:** Cervical cancer, Adherence to Radiation Therapy, Psychological distress, Health care systems, Side effects, Economic status and Stage of the disease.

## **DEDICATION**

I dedicate this dissertation to:

The Almighty GOD for his unfailing kindness, love, grace and abundant favor upon my life. I also dedicate this to my ever loving and cheering parents for their continued support and encouragement given to me throughout my life and to my beloved husband Andrew Nalishuwa Mukubesa for his unfailing continued support, patience and love. Not forgetting my lovely and adorable children, Moses and Sibeso for their sacrifice, unweathering love and support to enable me to complete this study successfully and my siblings, sister and brother in-laws for their encouragement, continued support and love. Lastly, I dedicate this to Mr Mwale Alex, Sr Justina Moyo and the entire Male Ward 2 Nurses at Cancer Diseases Hospital for their support, encouragement and love.

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## ACRONYMS

AIDS	Acquired Immuno deficiency Syndrome
ACS	American Cancer society
CaCx	Cervical Cancer
CDH	Cancer Diseases Hospital
CFCRA	Conceptual Framework for Consideration of Radiotherapy Access
CSO	Central Statistical Office
FIGO	International Federation of Gynecological Obstetrics
GLOBACAN	Global Cancer Incidence, Mortality and Prevalence
HIV	Human Immuno deficiency Virus
IEC	Information, education and communication
NCCN	National Comprehensive Cancer Network
NHRA	National Health Research Authority
OPD	Out Patient Department
RT	Radiation therapy treatment
SPSS	Statistical Package for Social Sciences
SSA	Sub-Saharan Africa
UNZA	University of Zambia
UNZABREC	University of Zambia Biomedical Research and Ethics Committee
MDT	Multidisciplinary team
WHO	World Health Organization

## **CHAPTER ONE**

### **1.1 INTRODUCTION**

Radiation therapy is an important mode of treatment among cervical cancer patients and it helps to improve patient's quality of life as well as increasing higher chances of survival rates. It is cardinal that cervical cancer patients adhere to prescribed fractions of radiation therapy (Kamnda, 2017). This chapter therefore presents an overview of factors influencing adherence to radiation therapy among cervical cancer patients. It outlines the background information to the study problem, research justification for conducting this study as well as research objectives, research questions used in the study and the research variables which were measured in the study.

### **1.2 BACKGROUND INFORMATION**

Cervical Cancer (CaCx) is one of the most common female cancers in the world; this disease ranks as the fourth most frequently diagnosed cancer and the fourth leading cause of cancer deaths in women (Thapa et al., 2018). It is a critical public health issue in sub-Saharan Africa (SSA), where it is the second leading cause of cancer among women and the leading cause of female cancer / deaths (Black and Richmond, 2018). The highest regional incidence and mortality rates are seen in Africa with rates elevated in Southern Africa i.e. Swaziland, Malawi and Zimbabwe (Bray et al., 2018). In sub-Saharan Africa, CaCx incidence has also been influenced by the high prevalence of HIV/AIDS infection, which has been found to promote progression of cancerous lesions (Black and Richmond, 2018).

A study conducted by Kalubula et al., (2018) indicated that Zambia is one of the Sub-Saharan African countries that have not been spared by the increasing burden of cancers, among which the prevalence rate of cervical cancer has been 97.1 per 100,000 females and represents 34.3% of all cancers in Zambia. The study further asserted that CaCx peak age was 40-49 years. In Zambia cervical cancer is the commonest among women with the highest mortality rate (Muntanga and Silwanga, 2019). The GLOBACAN statistics shows that the annual reported new cases in Zambia 2018 were 2994 with 1839 deaths (Bray et al., 2018).

It is estimated that every year, more than 14 million new cases of cancer are diagnosed globally, of which radiation therapy (RT) has the potential to improve the rates of cure in 3.5 million cases and to provide palliative relief for another 3.5 million people worldwide (Torre et al., 2016). This conservative estimate is based on the fact that approximately 50 percent of all cancer patients can benefit from RT in the management of their disease (Cho and Chun, 2018). Although there are three main treatment modalities for cancer including surgery, chemotherapy and radiation therapy, RT has been indicated as one of the most common treatments for most cancers worldwide (Beavis et al., 2017). RT uses high-energy particles such as x-rays, gamma rays, electron beams and protons, to destroy cancer cells (Beavis et al., 2017). RT has been shown to be one of the most cost-effective ways to treat patients on a curative and palliative basis. It is generally indicated for more than 50% of all cervical cancer patients (Kamnda, 2017). On the other hand, a combination of chemotherapy and radiation therapy is often recommended for patients with extra pelvic metastatic cervical cancer or in cervical cancer patients with recurrent disease who are not candidates for radiotherapy or extensive surgery (Vora and Gupta, 2018). The use of concurrent chemotherapy and RT has been shown to significantly improve tumor eradication and survival in a number of cancers including CaCx. It may improve local control, result in organ preservation, and eradicate distant microscopic metastases.

Despite the documented role of RT in improving cure rate and palliation for cervical cancer cases, its effectiveness is highly dependent on the level of adherence (Moelle et al., 2018). Cervical cancer patient's adherence to medical advice and procedures is crucial for successful treatment as not adhering might lead to poor prognosis of the disease which may even result in death (Kamnda, 2017). According to the World Health Organization (WHO), adherence is a person's behavior concerning taking medication / treatment, following a diet, and making changes in lifestyle in accordance with a medical or non-medical health professional recommendations (Rubinsak et al., 2019). Moelle *et al.*, (2018), indicated that Patients who adhered to guideline-conforming RT had optimum survival.

According to Berry *et al*, (2015), low adherence is the primary cause of a decreased clinical condition, and health workers often ignore this problem by not making follow ups on patients who miss treatment appointments and reviews. This factor is relevant because it can increase the risk of relapse after treatment and reduce effectiveness of anti-cancer therapies (Berry *et al*, 2015). Some other factors which may reduce adherence to radiation therapy include educational barriers due to a poor understanding of the nature of the disease and the treatment as well as socioeconomic barriers and psychosocial barriers due to logistics and lack of appropriate counseling respectively (Rangarajan and Jayaraman, 2017). Kamnda, (2017) also indicated that the poor adherence to RT among cervical cancer patients in low and middle-income countries can be attributed to a variety of factors. This includes inadequate cancer diagnostic and treatment facilities as well difficulties in accessibility. Lack of trained personnel who should work in a multidisciplinary team also contributes to non-adherence to RT. Late presentation which often necessitates more intense treatment increases the risk of treatment related mortality. Most of the patients also have a lot of comorbidities, including hypertension, diabetes and HIV/AIDS which increase the rates of toxicity as well as death (Kamnda, 2017). This study was therefore designed to investigate the levels of adherence and factors that influence adherence to radiation therapy treatment among cervical cancer patients being treated at Cancer Diseases Hospital.

### **1.3 STATEMENT OF THE PROBLEM**

Adherence to radiation therapy is very cardinal in the recovery process of a patient, it can also be a determining factor to the prognosis of patient's disease (Kamnda, 2017). Despite the importance of adherence to RT, many patients rarely follow treatment schedule as prescribed due to social-economic factors, side effects of the treatment and poor health care services (Moelle *et al*., 2018). The consequences of poor adherence to RT are usually poor prognosis, high recurrence rates, high hospitalization rates, and overall deaths (Gizaw *et al*., 2017). According to the 2020 CDH annual report, there was a steady increase in the number of CaCx patients being admitted and treated with RT from 2018 to 2020. Regardless of the increase in the number of CaCx patients being prescribed with RT there was a significant increase in the number of patients dying from

CaCx in 2019 and 2020 compared to 2018 as can be seen in figure 1.1. The slight reduction in 2020 was attributed to the Covid 19 outbreak as some of the patients are believed to have died from home without being captured due to Covid 19 restrictions (Muntanga and Silwanga, 2020). It was against this background that the researcher embarked on a study to assess the level of adherence and factors influencing adherence to RT among CaCx patients. Erratic adherence to treatment has contributed to anticancer drug resistance and worsened clinical condition, other negative consequences for failing to adhere to treatment include; decreased survival, higher recurrence treatment failure rates and increasing health care costs (Gizaw et al., 2017). This study therefore sought to assess the level of adherence and factors influencing adherence to radiotherapy treatment by cervical cancer patients at cancer diseases hospital.

**TABLE 1.1: Number of patients' admitted at CDH and the mortality rate per year.**

<b>Year</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>
<b>CaCx patients admitted at CDH</b>	501	703	856
<b>Mortality rate for CaCx patients at CDH</b>	100 (20%)	229 (33%)	200 (23%)

**Source: CDH 2020 Annual Report, (Muntanga and Silwanga, 2020)**

There was no documented data on adherence to radiation therapy among cervical cancer patients at CDH to show the magnitude of the problem, to this effect the number of patients been admitted and prescribed on RT as well as the mortality rate was used to better show the magnitude of the problem of adherence to RT among cervical cancer patients at CDH.

#### **1.4 STUDY JUSTIFICATION**

Cancer treatment adherence is crucial to obtain optimal health outcomes, such as cure or improvement in quality of life (Kamnda, 2017). Not adhering to recommended treatment

modalities has been shown to have negative clinical outcomes leading to decreased survival rates, lack of adherence have negative impacts on both curative and palliative goals of treatment, and adversely affect the quality of life of patients and health economics of the nation (Moelle et al., 2018). Even if more emphasis is being placed on preventive measures and screening strategies in the fight towards cervical cancer. Measures to improve adherence of treatment strategies equally play an important role in the therapeutic management of cervical cancer. In Zambia, literature regarding adherence to radiation therapy among cervical cancer patients is almost none existence. This study was conducted to assess the level of adherence and identify how demographic factors, health care system and psychological distress as well as side effects of the treatment and the stage of the disease affect adherence to radiation therapy treatments among cervical cancer patients in Zambia. This study has therefore added to the body of knowledge and provided recommendations to Cancer Diseases Hospital and other stakeholders, on how adherence to radiation therapy can be improved. The recommendations provided may also help formulate strategies on how to promote adherence to RT and highlight the challenges being faced by CaCx patients receiving RT. Furthermore, the information may be used to develop Information, Education and Communication (IEC) materials for nurses to utilize in teaching patients on adherence.

## **1.5 CONCEPTUAL FRAMEWORK**

The Conceptual framework which guided this study was the conceptual framework for consideration of radiotherapy (RT) access. It was developed by Sundenesan *et al.*, (2016), to define optimal radiation therapy utilization rates in the management of cancer patients (Sundaresan et al., 2016). Due to the difficulties experienced to access an exact conceptual framework specifically on adherence to RT. This conceptual framework was borrowed and modified to study how different variables do affect adherence to RT.

### **1.5.1 CONCEPTUAL FRAMEWORK FOR CONSIDERATION OF RADIOTHERAPY (RT) ACCESS (CFCRA).**

This conceptual framework for consideration of radiation therapy (RT) access was developed in order to identify factors reported to affect RT utilization faced by patients with cancer. According to Sundenesan *et al.*, in 2016, issues impacting on opportunity for RT availability services included presence of health service infrastructure such as the facility, equipment and staff required for the delivery of Radiation therapy services. The core elements of CFCRA as they relate to radiation therapy utilization and factors influencing utilization adherence in cancer patients is described below; **Equity**; RT Utilization, Service level factors, **Candidacy**; Consumer level, factors Referrer level factors, **Opportunity for RT**; Availability, Affordability, Acceptability, Adequate of RT services.

### **1.5.2 APPLICATION OF THE CFCRA IN THIS STUDY**

In this study, the researcher utilized the model to understand how its core elements relate to the study variables and how they will influence adherence to radiation therapy among cervical cancer patients.

### **1.5.3 OPPORTUNITY FOR RT**

**Availability:-** Service availability in this study was related to the perceived quality of health care system i.e. presence of health service infrastructure such as facility, equipment and staff required for the delivery of RT services and how they may affect adherence to radiation therapy among cervical cancer patients.

**Adequacy: -** Adequacy in this study focused on perceived quality of health care system which looks at the availability of modern technologies at Cancer Diseases Hospital and practice types, as well as the quality of RT offered. This helped the researcher to assess the potential impact of service adequacy on adherence to radiation therapy among cervical cancer patients.

**Affordability: -** Affordability in this study referred to the economic status i.e. it takes several financial considerations for patients making decisions regarding

adherence to RT i.e. financial pressure which may arise from costs, such as transport, accommodation where relocation was necessary, cost of care arrangements for dependents, work productivity and time costs. Families were care givers required time off work to travel with the patient for physical and psychological support may face additional losses to family incomes. Therefore the researcher assessed how all those factors may influence the patient's adherence towards radiation therapy.

**Acceptability:** - In this study acceptability was related to the stage of the disease and side effects of radiations therapy. This referred to how well cervical cancer patients had accepted the stage of the disease, the type of treatment (RT) and the side effects that they will experience as a result of receiving RT and their eagerness to seek and receive RT. Hence the researcher assessed how this factor may certainly affect the adherence to RT among cervical cancer patients.

#### 1.5.4 CANDIDACY

**Consumer level factors:** - This element was related to demographic factors such as occupation and economic status. RT typically consists of daily outpatient treatments given over weeks. It is likely that the practicalities of transport concern patients and their carers during RT related decision making. The need to travel and relocate may affect the adherence to radiation therapy uptake of cancer treatments.

**Unmet psychosocial needs:** - In this study the element was related to psychological distress. Cancer patients experience high levels of unmet needs, especially in the psychological domain. In this study unmet psychological needs referred to how psychological distress from diagnosis and need for treatment, separation from family and support networks, forced changes to family roles, disruption to work and family routines may affect adherence to radiation therapy among cervical cancer patients.

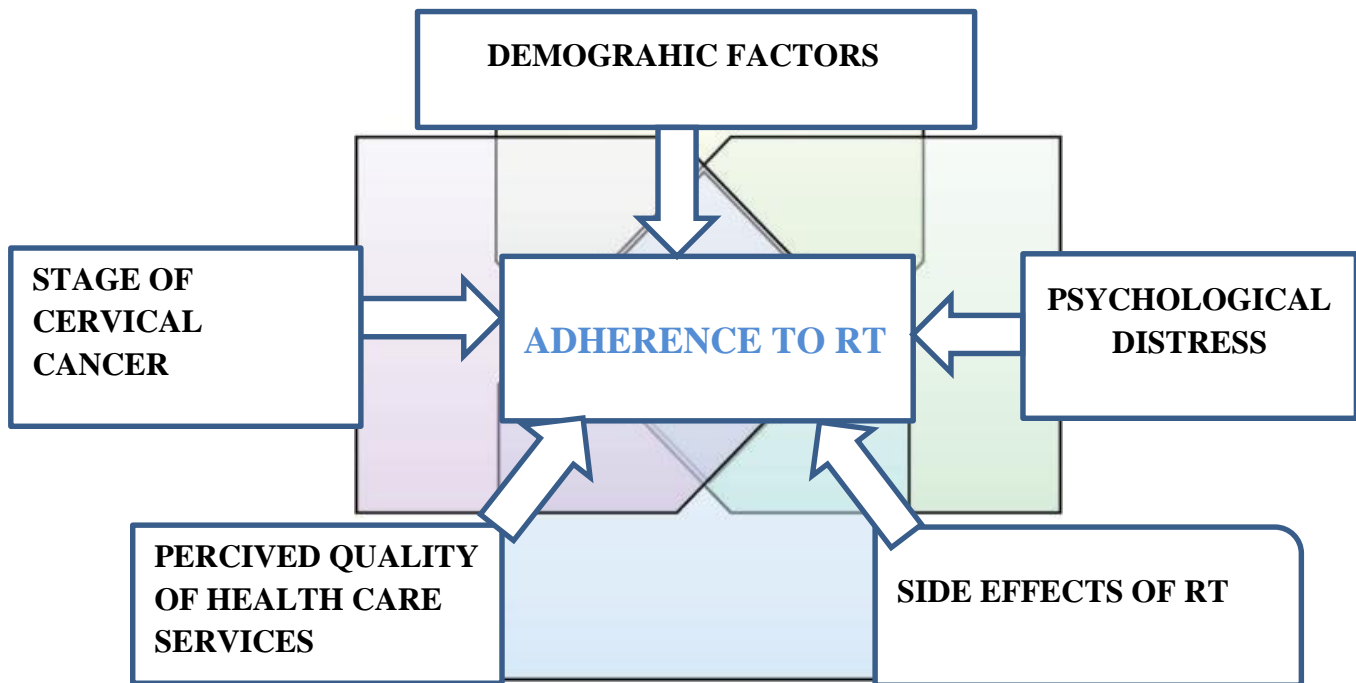
**Consumer's medical comorbid status:** - Consumers medical comorbid status in this study was related to the stage of the disease and psychological distress. This

referred to how the presence of other diseases can worsen the patient's physical and psychological condition thereby influencing the adherence to radiation therapy among cervical cancer patients e.g., HIV/AIDS, Diabetes and Hypertension.

**Consumer perceptions of RT-related inconvenience:-** In this study the patient's perceptions was related to perceived quality of health care system which referred to how the time and inconvenience in receiving RT may have affected adherence to radiation treatment decisions. Given the need for daily treatment over many weeks, attendance for RT can be inconvenient.

**Presence and effectiveness of multidisciplinary teams:-** In this study multidisciplinary team (MDT) was also related to Perceived quality of health care system which referred to the meetings that provide a forum for discussing patient's cases with input from various specialists and provide the opportunity to overcome barriers relating to issues influencing adherence to radiation therapy among cervical cancer patients.

### 1.5.5 CONCEPTUAL FRAMEWORK FOR CONSIDERATION OF RADIOTHERAPY (RT) ACCESS 2015



**Figure 2.0; Modified Conceptual Framework for Consideration of Radiotherapy (RT) Access (Sundenesan et al, 2016).**

#### 1.6 RESEARCH QUESTION

1. What is the level of adherence to radiation therapy treatment and what factors influence adherence among cervical cancer patients?

#### 1.7 GENERAL OBJECTIVE

To assess the level of adherence and factors influencing adherence to radiation therapy in cervical cancer patients at Cancer Diseases Hospital.

#### 1.8 SPECIFIC OBJECTIVES

- i. To determine the levels of adherence to radiation therapy by cervical cancer patient.

- ii To identify factors associated with adherence to radiation therapy among cervical cancer patients

**1.9 VARIABLES**

**1.9.1 DEPENDENT VARIABLE**

Adherence to radiation therapy treatment

**1.9.2 INDEPENDENT VARIABLES**

- i. Demographic factors which include; Age, Marital status, Level of education and Church denomination.
- ii. Psychological distress
- iii. Perceived quality of health care services including availability of health facility equipment’s and qualified health care providers.
- iv. Stage of cervical cancer
- v. Side effects of radiotherapy e.g. cystitis, diarrhea, pain etc.

**1.9.3 TABLE OF RESEARCH VARIABLES AND CUT OFF POINTS**

**TABLE 1.2: Research variables and cut of points**

<b>DEPENDENT VARIABLES</b>	<b>INDICATOR</b>	<b>CUT OF POINT</b>	<b>QUESTION NUMBERS</b>
Adherence to radiation therapy treatment.	Adherence	If patient scores above 3 on adherence out of 7.	Question 24 to 30
	Non adherence	If patient scores 3 or less on adherence out of 7.	
<b>INDEPENDENT VARIABLES</b>			
Demographic variables (Income)	High >(K5000)	If patient is employed/ doing business and comes from a premium residential area and earns more than K5000 per month.	Question 5 to question 8
	Medium (K3000-K5000)	If a patient is employed or not employed, doing business and comes from medium residential area and earns between K3000 and K5000 per month.	

	Low <(K3000)	If the patient is employed, not employed, doing business and comes for a low class residential area and earns less than K3000 per month.	
Psychosocial factors	No distress	If the patient received RT with minimal to no psychological distress.	Question 9 to question 18
	Mild distress	If patient was distressed psychologically but still managed to complete the prescribed RT.	
	Severe distress	If the patient was distressed psychologically and could not complete the prescribed treatment.	
Perceived quality of health care services	Good	If the client reported experiencing quality health care (perceiving that the facility had equipment, drugs and qualified health care providers).	Question 19- question 23
	Poor	If the client reported experiencing inadequate health care services (perceiving inadequate equipment, drugs and qualified health care providers).	
Stage of cervical cancer	Early	Stage I- stage I B	Question 31 to 34.
	Late	Stage II B to stage IV	
Side effects of radiotherapy	Severe	If patient experienced major side effects such as pain and radiation cystitis.	Question 34-37
	Moderate	If patient experienced moderate side effects such as fatigue, skin problems, low blood cell counts	
	Mild	If patient experienced minor side effects such as vomiting, nausea, diarrhoea.	

## 1.10 DEFINITION OF TERMS

### 1.10.1 CONCEPTUAL DEFINITIONS

**Adherence:** Adherence to therapy is defined as the extent to which a person's behavior in taking medication, following a diet, and/or executing lifestyle changes, corresponds with agreed recommendations from a healthcare provider (Antonio et al., 2018).

**Non Adherence:** This is the resulting condition when a patient does not stick or stay with a prescribed therapeutic regime (Antonio et al., 2018).

**Cancer:** Is the common term for all malignant tumors and can be defined as a group of diseases characterized by uncontrolled cell division (Duska, 2016).

**Cervical cancer:** Is a type of cancer that occurs in the cells of the cervix, the lower part of the uterus that connects to the vagina (Kamnda, 2017).

**Stage of cancer:** This is the description on how far the cancer has grown and spread at the time of diagnosis e.g. stage I were the carcinoma is strictly confined to the cervix i.e. extension to the uterine corpus should be disregarded (Bhatla et al., 2018).

**Radiotherapy:** Radiation therapy (also called radiotherapy) is a cancer treatment that uses high doses of radiation to kill cancer cells and shrink tumors (Chanda et al., 2019)

**Side Effects:** An unpleasant effect of a drug that is independent of the mechanism of action of the drug, it happens in addition to the main effect (Degu et al., 2017).

**Income:** Involving or pertaining to one's personal resources of money (Trejo et al., 2020).

**Perceived quality of health care services:** The quality of a formal structure for a defined population, whose finance, management, scope, and content is defined by law and regulations (Gebremariam et al., 2019).

**Psychological distress:** is a state of emotional suffering associated with stressors and demands that are difficult to cope with in daily life (Almigbal et al., 2019).

### 1.10.2 OPERATIONAL DEFINITIONS

**Adherence:** To strictly follow health care providers recommended instructions such as receiving all the prescribed fractions of radiation therapy treatment without any interruptions and keeping appointment dates, .e.g. completing the radiation therapy of 30 days 46 grays as prescribed by an oncologist within the prescribed period of time without re-scheduling or re-starting the RT fractions.

**Non-Adherence:** Missing or not completing the prescribed fractions for any reason over a period of time, this included those who completed RT therapy but not according to the prescribed time or where the process had to be restarted from the beginning in cases where the patient missed treatment.

**Cancer:** A term for diseases in which abnormal cells divide without control and can invade nearby tissues.

**Cervical cancer:** This is a malignant disease that occurs when the cells of the cervix proliferate to abnormal cells and can affect deeper cell layers.

**Stage of cancer:** This is the description of how far the cervical cancer has spread to the nearby tissues.

**Radiation therapy:** treatment involving high-energy rays often used to destroy cancer cells and stop them from growing and dividing.

**Side effects:** Undesired harmful effects resulting from radiation therapy such as vaginal stenosis and premature menopause.

**Income:** Pertaining to the patient's financial status or source of income availability of hospital resources and housing.

**Perceived quality of health care services:** This involves how the participants viewed the organization of health care services by providing leadership for securing resources and equipment's that are needed for patients to receive RT. It also involved perception

patient about how they remove barriers to patients, by ensuring availability of qualified health care providers.

**Psychological distress:** The functioning of cancer patient in daily life, concerns in their environment and biography.

## **CHAPTER TWO: LITERATURE REVIEW**

### **2.1 INTRODUCTION**

This chapter reviewed literature on adherence to RT among cervical cancer patients and referred to other researchers who conducted similar studies on adherence to RT among cervical cancer patients. The review helped the researcher explore the different best practices on RT treatment recommendations adopted in other countries around the globe, to prevent morbidity and mortality related to cervical cancer patients. The purpose and process of this review was to identify scientific, evidence based literatures that would add value to the study.

Literature review in this study was conducted to establish what others have learnt and reported on adherence to radiation therapy among cervical cancer patients. It is arranged according to variables, starting with adherence to radiation therapy among cervical cancer patients and then followed by literature on all the independent variables which include; social demographic factors, perceived quality of health care services, psychological distress, stage of the disease and the side effects of radiation therapy. The reviewed literature therefore provided a convincing argument why a research study on adherence to radiation therapy treatment among cervical cancer patients was needed. The data search was conducted on various published and unpublished articles, journals published between 2016 and 2021 in relation to the topic of study from Google scholar, PubMed, web of science, science direct and Scopus as data bases.

### **2.2 ADHERENCE TO RADIATION THERAPY**

There is a huge global disparity in cancer survival rates for women worldwide (Ginsburg et al., 2017). Radiotherapy plays a key role in the treatment of cervical cancer patients with over 50% of individuals now receiving radiation therapy at some time during the course of their disease, (Ferreira da Silva et al., 2019). However, for treatment to be successful patients should adhere to radiation therapy. On a global level, poor adherence also causes a financial burden on already scarce resources of health care systems. In the United States alone, the total cost associated with medication non-adherence has been estimated to be between \$100 and \$300 billion a year (Pednekar et al., 2019). In the study conducted by Shah et al., (2019), they highlighted lack of resources in the peripheral

district of Uttar Pradesh as patients had travelled from periphery to seek treatment to the capital, which lead to frequent treatment breaks and poor adherence for follow up (Shah et al., 2018). In another study conducted by Kumar *et al.*, (2017), they indicated that the other most common causes for missed treatment and non-adherence to RT were hospitalization and toxicity. The reasons for hospitalization were chemotherapy administration, blood transfusion and treatment related toxicity. In another study conducted in Guatemala by Zamorano et al., 2019, low recurrence rates and no documented deaths suggested a correlation with the poor adherence rate due poor patient follow-up. This finding highlighted the need to examine more fully the barriers to adherence and access to care among their population to optimize the treatment of cervical cancer.

It was further indicated that the low adherence rates complicates the ability to optimize cervical cancer treatment (Zamorano et al., 2019). In the lower-resource settings such as Africa, cervical cancers disproportionately affect women in the prime of life, resulting in a significant economic and societal impact. A woman's country, region of residence, income level, socio-economic, ethno-cultural status should not be allowed to influence the likelihood of dying from these common cancers because effective, affordable, cost effective and life-saving interventions exist (Ginsburg et al., 2017). Therefore, there is need to increase awareness about the disease and its treatment to improve treatment and the need for adherence. Although prospective studies are required to evaluate risk factor for non-compliance to RT in the population, it is also important for individual institutions to assess site specific weaknesses in health care delivery that impedes treatment compliance(Kumar et al., 2017).

Definitive radiotherapy for various cancers can be delivered with good adherence in most patients. According to Kumar et al., (2017), Eighty four percent of their treated patients completed treatment successfully without any interruptions. They suggested that further studies are required to evaluate the risk factors for poor adherence to RT. Public awareness about the disease and treatment should be ensured to improve treatment compliance. Patients who adhere to guideline-conforming RT have an optimum survival, hence better supportive care, reduction of toxicities, socioeconomic support, and

additional radiation capacities could contribute to better adherence and survival (Moelle et al., 2018).

### **2.3 DEMOGRAPHIC FACTORS**

Demographic factors refer to a set of variables such as age, marital status, level of education that affect adherence to radiation therapy treatment among patients with cervical cancer (Kamnda, 2017). Rubinsak et al, (2019) indicated that, age may play an important role because of the comorbidities of aged patients or the assumed low RT tolerance. On a clinical level, their data suggested that improvement was needed to correct the situation and the question remained on how best as to improve RT compliance among breast and cervical cancer patients (Rubinsak et al., 2019).

According to Ginsburg et al., (2016), cervical cancer in lower-resource settings disproportionately affects women ranging between 35-45 years of age, resulting in significant economic and societal impact. The women's deaths have complex effects on the children and families they leave behind. This is because women are central not only in direct care giving for their own children, but more broadly in society, playing key roles in the socialization, education and health of children (Ginsburg et al., 2016). In a study conducted in Poland by Rangarajan and Jayaraman, (2017), they indicated that Health inequalities, related to socioeconomic status, particularly education, was a crucial issue which posed a challenge in attempts to control non-adherence to cervical cancer treatment. Similarly in another study conducted by Pikala et al., (2019) it was noted that among their study participants women with elementary education died more than the women with university education (Pikala et al., 2019).

There is overwhelming evidence that investing in women's health and promoting adherence to RT provides significant economic returns (Rangarajan and Jayaraman, 2017). Hence addressing the global burden of women's cancers and advocating for good adherence to RT should be considered a sound investment by governments. The case is compelling given the profound impact of these cancers on premature death and disability, with substantial and long-lasting social, financial and economic consequences for the

affected women, their immediate family and their wider community' (Ginsburg et al., 2017).

Kumar et al., (2017), evaluated multiple socio-economic and treatment related variables as risk factors for non-adherence and found no variable was significant enough to predict non-adherence. They associated this finding with the relatively small sample size and low number of missed treatments that might have precluded the finding. The most frequent reasons for each missed treatment were noted as reported by the patient, treating physician or radiation technologist at the time of patient absence. They also discovered that majority of their study patients belonged to low socio-economic status , with poor educational background and were noted to be unaware about the importance of the ongoing treatment (Kumar et al., 2017). In another study, Moelle et al., (2018), found that twenty two percent of their study participants did not return for RT due to financial or logistical reasons. However, a larger number of patients discontinued for undocumented reasons, most likely financial and logistical obstacles. The investigators therefore concluded that socioeconomic support for patients in need, were thought to be necessary for better therapy adherence.

## **2.4 PSYCHOLOGICAL DISTRESS**

Cervical cancer is a prominent risk factor for developing depression following the diagnosis. Depression might affect women with cervical cancer and can deteriorate their quality of life or even their compliance with cancer treatments. Depression or major depressive disorder includes many different disorders and is characterized by low mood, difficulties in decision-making and thinking, loss of energy, loss of pleasure and interest in joyful activities, sleep and appetite annoyances, psychomotor annoyances, and suicidal thought (Grossman, 2015).

Depressed patients present with a state of low mood and loss of enthusiasm for joyful activities, while lowered self-esteem, worthlessness, hopelessness, or suicidal ideation may also affect cancer patients with depression. The etiology of psychiatric symptoms in cervical cancer survivors may be related to physical stressors of surgical menopause,

chemotherapy, radiotherapy, and physical discomforts associated with cancer treatments. Thus, these mood disturbances might influence treatment compliance, reduce the quality of life, and lower performance status (Shyu et al., 2019).

When patients with comorbidities are diagnosed with cervical cancer, care and prevention of depressive mood should be given special attention. According to Shyu et al., (2019), they discovered that cervical cancer patients with comorbidities, including diabetes mellitus, cerebrovascular disease, or ischemic heart disease, had a higher risk of subsequent depression. Thus, early intervention of the psychiatric condition in cancer patients may reduce depression and even improve their quality of life and adherence to cancer treatments.

Therefore, preventing the development of depression and other psychiatric symptoms can improve patients' adherence to RT. Elsner et al., (2017), recognized the need to address psychosocial issues and indicated that radiation therapists can positively impact on patient experiences of radiation therapy. They discovered that specifically, RT patient interactions can reduce patient anxiety through effective communication, forming relationships and provision of education/information concerning the benefits of RT treatments. They further asserted that Patient anxiety could be further reduced by exploring the RT role, application of screening and needs assessments and training in both communication skills and detection and management of emotional distress. The study also indicated that it was a well-known fact, that radiation therapists are not confident discussing psychosocial issues hence the need for all health workers working with cancer patients to have skills in early detection of psychosocial issues, empathetic management and effective referrals to specialized care (Elsner et al., 2017).

## **2.5 PERCEIVED QUALITY OF HEALTH CARE SERVICES**

In the study conducted by (Rangarajan and Jayaraman, 2017), they indicated that health care related factors can be associated with greater non-adherence which may include having follow-up appointments with a general practitioner instead of an oncologist, prescription for cancer treatment provided by a non-oncologist, receiving misinformation about the treatment from the physician, long waiting times in the clinics and having to travel long distances to clinics. According to Rangarajan and Jayaraman, (2017), factors

such as missing appointment, prolonged treatment and poor understanding of treatment advantages were significantly affecting treatment adherence.

Another study conducted by (Lohlun et al., 2015), indicated that non-adherence to treatment affects the health of individuals and influences the function of health care systems. It had shown to have increased the risk of hospitalization, number of emergency department visits, and rate of mortality, some of which may have been delayed, reduced or avoided had patients remained adherent. The reasons for missed treatment were lack of transportation, patient refusal and treatment machine breakdown. They also discovered that some patients missed treatment due to some family emergency situation while some of the patients missed treatment due to unknown reasons (Kumar et al., 2017). Moelle *et al.*, (2018), found out that a larger number of patients discontinued for undocumented reasons, most likely financial and logistical obstacles or breakdown of the RT machine hence reliable maintenance services with available spare parts and more RT machines are necessary for better therapy adherence.

## **2.6 STAGE OF CERVICAL CANCER**

Cervical cancer staging is done to ascertain the extent of local diseases and hematological and lymphatic spread to other organs, staging is also valuable in the determination of how to manage the disease (Kamnda, 2017). A study conducted in India, indicated that women with cervical cancer stage IIIB-IVA were seen to have responded well radiotherapy treatment and these findings were supported by evidence from another study conducted in Kenya (Mapanga et al., 2020).

### **2.6.1 INTERNATIONAL FEDERATION OF GYNECOLOGY AND OBSTETRICS (FIGO) STAGING**

Cervical cancer spreads by direct extension into the parametrium, vagina, uterus and adjacent organs, i.e., bladder and rectum. It also spreads along the lymphatic channels to the regional lymph nodes, namely, obturator, external iliac and internal iliac, and thence to the common iliac and Para-aortic nodes. Distant metastasis to lungs, liver, and skeleton by the hematogenous route is a late phenomenon. Until now, the FIGO staging was based mainly on clinical examination with the addition of certain procedures that were allowed

by FIGO to change the staging. In 2018, it was revised by the FIGO Gynecologic Oncology Committee to allow imaging and pathological findings, where available, to assign the stage. The revised staging is shown in the table presented at the FIGO XXII World Congress of Gynecology and Obstetrics (Bhatla et al., 2018). According to Berek et al, 2019, the accuracy of staging reflects a more refined understanding of prognostic groups, which facilitates better treatment adherence to RT for women with invasive cervical cancer (Berek et al., 2019). Another study showed that an accurate FIGO staging system for cervical cancer is useful to distinguish survival groups. In stage IB cervical cancer, stage IB1 and stage IB2 diseases which have distinct characteristics and outcomes which are crucial in the treatment of CaCx patients (Matsuo et al., 2019).

**TABLE 2.1 FIGO STAGING OF CANCER OF THE CERVIX UTERI**

<b>STAGE</b>	<b>DESCRIPTION</b>
I	The carcinoma is strictly confined to the cervix (extension to the uterine corpus should be disregarded)
II	The carcinoma invades beyond the uterus, but has not extended onto the lower third of the vagina or to the pelvic wall
III	The carcinoma involves the lower third of the vagina and/or extends to the pelvic wall and/or causes hydronephrosis or nonfunctioning kidney and/or involves pelvic and/or para-aortic lymph nodes
IV	The carcinoma has extended beyond the true pelvis or has involved (biopsy proven) the mucosa of the bladder or rectum. (A bullous edema, as such, does not permit a case to be allotted to Stage IV)

**Source : Figo Staging of Cancer of the Cervix Uteri, (Bhatla et al. 2018).**

## **2.7 SIDE EFFECTS OF RADIOTHERAPY**

Treatment related toxicities are an important factor impairing treatment compliance, there by effecting therapeutic outcome (Kumar et al., 2017). Some possible side effects of EBRT and brachytherapy for cervical cancer are fatigue, upset stomach, vaginal stenosis,

diarrhea, skin changes, radiation cystitis, vaginal pain, menstrual changes and low blood counts. The long-term side effects of radiation therapy treatment may be vaginal stenosis, vaginal dryness, weakened bones and swelling of the leg(s). If pelvic lymph nodes are treated with radiation, it can lead to fluid drainage problems in the leg. This can cause severe swelling in the leg, a condition called lymphedema (Degu et al., 2017).

According to Degu et al., (2017), adverse drug reactions, such as nausea and vomiting were the most prevalent adverse reactions reported by among the cervical cancer study participants. The advanced stage of cervical cancer and treatment with more than five drugs were significant predictors of adverse drug reactions leading to missed treatment (Degu et al., 2017). Similarly in the study conducted by Kumar et al., 2017, some missed treatments were most commonly caused by hospitalization, acute toxicity, treatment machine maintenance, (Kumar et al., 2017). Moelle et al., 2018, found out that some of the patients discontinued receiving RT because of radiation toxicities. Among patients assigned to radical and non-radical RT, 49% and 17%, respectively, discontinued their radiation therapy schedules and had lower chances of survival. Most known discontinuations were because of radiation toxicities. However, the associated acute treatment toxicity of radiotherapy among women was seen to be an independent significant risk factor that interrupts or delay treatment resulting in most of these women not completing their prescribed treatments (Mapanga et al., 2020).

## **2.9 CONCLUSION**

The reviewed literature has shown that several research studies conducted, reported that adherence to radiation therapy treatment is a diverse problem that cannot be blamed on either patients or healthcare providers alone. A great percentage of cervical cancer patients have poor adherence to treatment recommendations due to several factors such as low social economic status, long distance to the health facility, lack of knowledge on the implications of non-adherence, psychological distress, and stage of the disease, demographic factors and side effect of the disease. Despite so many studies having been conducted on adherence to radiation therapy among cervical cancer patients in many countries, not much have been done in Zambia. It is for this very reason that the

researcher conducted a study on adherence to radiation therapy treatment among CaCx patients at CDH Lusaka, Zambia. This study has identified factors that affect adherence in a Zambian sample and subsequently made recommendations to assist relevant policy makers to formulate optimal strategies to improve adherence.

## **CHAPTER THREE: METHODOLOGY**

### **3.1 INTRODUCTION**

This chapter describes the research methodology used in this study. It outlines the process of development and validation of the research questions, how data was collected and how the analysis method was used leading to sound conclusions. It also critically shows how validity and reliability this study were evaluated. This chapter comprises of the research design, research setting, and study population, sample selection, sample size, data collection tool, validity, reliability, pilot study and ethical considerations for this study.

### **3.1 STUDY DESIGN**

The researcher used a cross-sectional analytical study design; it involved a systematic collection and presentation of data. It also attempted to qualify the effect of the independent variables on an outcome variable to describe their relationship on adherence to radiation therapy treatment among cervical cancer patients (Koh et al., 2019).

### **3.2 STUDY SETTING**

The study was undertaken at CDH in Lusaka District. CDH is situated in Lusaka the Capital City of Zambia along Nationalist Road, Ridgeway area in the South-West corner of the University Teaching Hospital premises. It has a catchment population of about 17.9 million people spread in all the ten provinces of Zambia with a catchment area of 752,610 square Kilometres (Muntanga and Silwanga, 2020).

The hospital offers the following services: - Clinical Oncology (Chemo and Radiation Therapy), Laboratory, Imaging, Pharmacy, and has recently expanded to include Surgical and Gynaecology Oncology, In - Patient Care, Epidemiology and Preventative Oncology. The site was chosen because it is the only oncology institution in Zambia where radiation treatments for cervical cancer cases are offered.

### **3.3 STUDY POPULATION**

The study populations were all women with cervical cancer aged 18 years and above who had accessed RT for a period of 6 - 8 weeks at CDH and were attending review clinics from OPD during study period.

#### **3.3.1 TARGET POPULATION**

The target population in this study were women suffering from cervical cancer aged 18 years and above and had accessed RT at CDH at the time of the study.

### **3.4 SAMPLE SELECTION**

In this study a fishbowl simple random sampling technique was used to select participants using a sampling frame for eligible CaCx patients who sought medical care from the Out-patient department. The sampling frame comprised of CaCx patients who had accessed health care services during the four months of data collection. At CDH during the data collection period approximately 30 CaCx patients are seen every week as out- patients. Therefore 30 pieces of paper were written and put in a box; 15 of them with a YES written while the other 15 had a NO, Those patients who picked a YES were recruited in the study while those with a NO were not recruited. This gave the patients with CaCx an equal chance of participating in the study.

### **3.5 INCLUSION CRITERIA**

- i. All outpatients with CaCx aged 18 years and above, who had received radiation therapy treatment for 6-8 weeks.
- ii. Consented to participating in the study.
- iii. Attended the cervical cancer review clinic during the study period.

### **3.6 EXCLUSION CRITERIA**

- i. Very ill CaCx patients i.e. in stage IV, on oxygen therapy or unconscious.
- ii. Patients who were receiving RT treatment at the time of the study as it was not certain on whether they were going adhere to treatment as prescribed.

### 3.7 SAMPLE SIZE

The sample size for quantitative data was calculated using the proportion precision formula;

$n = Z^2 \times P (1-P) / d^2$ . Where;

n =Sample Required

Z = 1.96 is the standard normal variance at 95% confidence level

P = the prevalence which is 0.13,

d = acceptable accuracy range (+/-0.05)

#### Sample size calculation

Z=1.96

$$n = Z^2 \times P (1-P) / d^2$$

P=0.13

$$n = 1.96^2 \times 0.013 (1- 0.13) / 0.05^2$$

d=0.05

$$n = 174.$$

**The sample size was calculated at 95% confidence level (Z = 1.96) with 0.13 (p = 0.13) prevalence of non-adherent cervical cancer patients according to Precision of ±5% (d = ±5%) due to lack of data on prevalence to adherence to radiation therapy among CaCx at CDH.**

### 3.8 DATA COLLECTION TOOL

A structured interview schedule was used to collect data. The instrument comprised of a series of questions which were closed ended and open ended. The interview schedule contained questions under six sections; Section A obtained information on demographic characteristics which included age, education, marital status and church denomination. Section B assessed economic status of the CaCx patients which contained monthly income and occupation, Section C assessed how psychological distress affects CaCx patients using the modified screening for distress survey tool (Bodnarchuk et al., 2014) , section D assessed how the health care system affects adherence to RT. The modified brief adherence rating scale was adapted and was used in measuring the patient's

adherence to radiation therapy. It is a widely used and well-validated tool for measuring patient's adherence to treatment with cronbachs alpha of 0.76 (Kane *et al.*, 2008).

Section E assessed the patient's adherence to radiation therapy treatment based on the modified brief adherence rating scale comprising of 7 questions ranging from Q24- Q30. The modified brief adherence rating scale probed 7 parameters and each item was scored either good or poor. Adherence to radiation therapy treatment was graded as good if the patient scored above 3 questions on section E and was graded as poor if the patient scored 3 and below on questions in section E. Section F assessed how the stage of CaCx affects adherence to treatment and section H assessed the side effects of radiation therapy treatment.

### **3.9 VALIDITY**

To ensure validity of the research tool, an extensive literature search was conducted to have adequate content coverage (Lessa *et al.*, 2015). External validity was sustained by ensuring that the required numbers of patients were interviewed (Gonzalez-Cabrera *et al.*, 2020). The validity of the instrument was further achieved through making simple, concise and brief questions based on the modified brief adherence rating scale by Kane *et al.*, 2008. Internal validity was achieved by testing the data collecting tool. The pilot study helped the researcher to adjust questions which were either difficult to answer or confusing to the patients.

### **3.10 RELIABILITY**

Reliability was achieved by utilizing validated modified tools which were brief adherence rating scale by (Kane *et al.*, 2008) with cronbachs alpha of 0.76 and modified screening for distress survey tool (Bodnarchuk *et al.*, 2014) with cronbachs alpha of 0.86. The cronbachs alpha of this study was 0.671.

### **3.11 DATA COLLECTION TECHNIQUE**

After the ethical clearance was granted and permission from CDH authorized, two research assistants from OPD were be engaged to assist with collecting data. The research assistants were oriented to the data collection tool and the technique through a one-day

course. During data collection the research assistants introduced themselves to the participants in order to make them feel at ease and participate without fear. The purpose, benefits and risks of the study were explained to the participants to enable them participate in a study they were aware of. After explaining to patients and upon their willingness to participate in the study, each participant was given a consent form to sign. Those who were unable to sign were asked to make a thumb print. To enable the participants participate without fear, confidentiality was assured by explaining that their identity would not be disclosed and they were informed that the interview was a face to face interview in a private room; the interview took 25 to 30 minutes with each respondent. The interviews were conducted on clients who were on the queues waiting to be seen by the oncologist. Consent was gotten and the participants who accepted to be interviewed would be invited to the private room to be interviewed.

### **3.12 PILOT STUDY**

A pilot study was conducted at CDH in female ward 1 and 4 to determine the reliability and validity of research instruments and gave the researcher experience with the participants. The sample size of the pilot study was 10% of the actual study sample population, which translated to 17 respondents. The respondents were selected using convenient sampling method because very few clients who have completed RT are found on the ward. The same hospital but separate units was used to collect data for the pilot and main study, i.e. Female ward one (FW1) and Female ward four (FW4) for the pilot study and the outpatient department for the main study. This was as a result of CDH being the only hospital in Zambia providing radiation therapy for CaCx patients and where the researcher could reach them as they come for reviews. There was no other hospital where a similar sample could be obtained. A semi structured interview schedule was administered and adjustments to the data collection tools were done as necessary following the pilot study.

### **3.13 ETHICAL CONSIDERATION**

Ethical clearance and permission was sought from the University of Zambia Biomedical Research Ethics Committee (UNZABREC) with (REF. NO. 1232-2020) and National

Health Research Authority (NHRA). Permission to conduct the study was further obtained from CDH Management. Prior to administering the data collection tool, the purpose and nature of the study was explained to each potential participant. Those who declined to participate were assured that no privileges would be taken away from them. Those who agreed to take part in the study were requested to sign consent to authorize participation in the study. Participants were assured of anonymity and confidentiality by interviewing them in privacy individually as well as ensuring that participants' names did not appear on the interview schedules. No other person apart from the researcher and research assistants were allowed to have access to the research data. Participants were not subjected to any physical harm as the research did not involve any invasive procedures. Knowing that CaCx is a chronic disease some patients were likely to experience discomfort or stress due to the interview, hence they were given counseling straightaway or afterwards depending on the situation and need. The researcher also engaged a psychosocial counselor and who was capable of meeting the psychological needs of the patients.

## **CHAPTER FOUR DATA: ANALYSIS AND PRESENTATION OF RESULTS**

### **4.1 INTRODUCTION**

This chapter presents the data which was collected using a structured interview schedule from 142 participants. The results are presented in frequency tables, bar graphs, histograms and cross-tabulations following the sequence of sections in the interview schedule. In this study the participants who were included in the study was hundred and forty two respondents (142) instead of 174, this was as a result of the covid19 outbreak which limited the number of patients being reviewed from OPD as most of them were advised not to attend OPD reviews unless in critical cases were they needed urgent attention. According to (Vasileiou et al., 2018) and (DelÍce, 2001), in any quantitative study it is allowed to collect and analyse data for at least 100 participants in cases where the researcher faces challenges such as financial resources, limited time or any other circumstances beyond their control.

### **4.2 DATA ANALYSIS**

Data was analyzed using the IBM® Statistical Package for Social Sciences (SPSS®) for Windows version 24.0. The Chi-square test was used to determine an association between predictor variables (demographic factors, economic status, psychological distress, perceived quality of health care services, stage of cervical cancer and side effects of radiotherapy) and outcome variable (adherence to radiation therapy treatment). For those cells having a frequency of less than 5 a fisher's exact test was used. The Confidence Interval (CI) of (95%) was set and set level of significance at 5%. The binary logistic regression analysis was used to determine true predictor of adherence to radiation therapy.

### **4.3 PRESENTATION OF RESULTS**

The results of this study are presented according to the sections of the interview schedule. Data were grouped together according to the variables under discussion. The results are presented using the frequency tables, bar graphs, histograms and cross-tabulations. Cross-tabulations were furthermore used to show the relationship between variables.

#### 4.4 DEMOGRAPHIC DATA

**Table 4.1: Demographic characteristics of the patients (n=142)**

Characteristics	Frequency	Percent
<b>Age</b>		
18-30 years	4	2.8%
31-50 years	79	55.6%
51-70 years	53	37.3%
71-90 years	6	4.2%
<b>Total</b>	<b>142</b>	<b>100%</b>
<b>Marital status</b>		
Single	17	12.0%
Married	75	52.8%
Widowed	39	27.5%
Divorced	11	7.7%
<b>Total</b>	<b>142</b>	<b>100%</b>
<b>Education</b>		
No formal education	9	6.3%
Primary	66	46.5%
Secondary	49	34.5%
Tertiary	18	6.3%
<b>Total</b>	<b>142</b>	<b>100%</b>
<b>Occupation</b>		
Civil servant	12	8.5%
Business	48	33.8%
Retired	2	1.4%
Unemployed	71	50.0%
General worker	6	3.2%
Private sector	2	1.4%
Non-governmental organization	1	0.7%
<b>Total</b>	<b>142</b>	<b>100%</b>
<b>Economic status (Monthly income)</b>		
Less than (K1000)	82	57.0%
Between (K1000-K3000)	29	20.4%
Between (K3000-K5000)	19	13.0%
Above (K5000)	12	8.5%
<b>Total</b>	<b>142</b>	<b>100%</b>

Table 4.1: shows that more than half 55.6% of the patients in the study were between the ages of 31-50 years. Close to half of the patients 46.5% had primary education, half of the participants 50.0% were unemployed and 57.7% of the participants had a monthly income of less than K1000.

#### 4.5 ADHERENCE TO RT

**Figure 4.1: Patients' adherence to RT (n=142)**

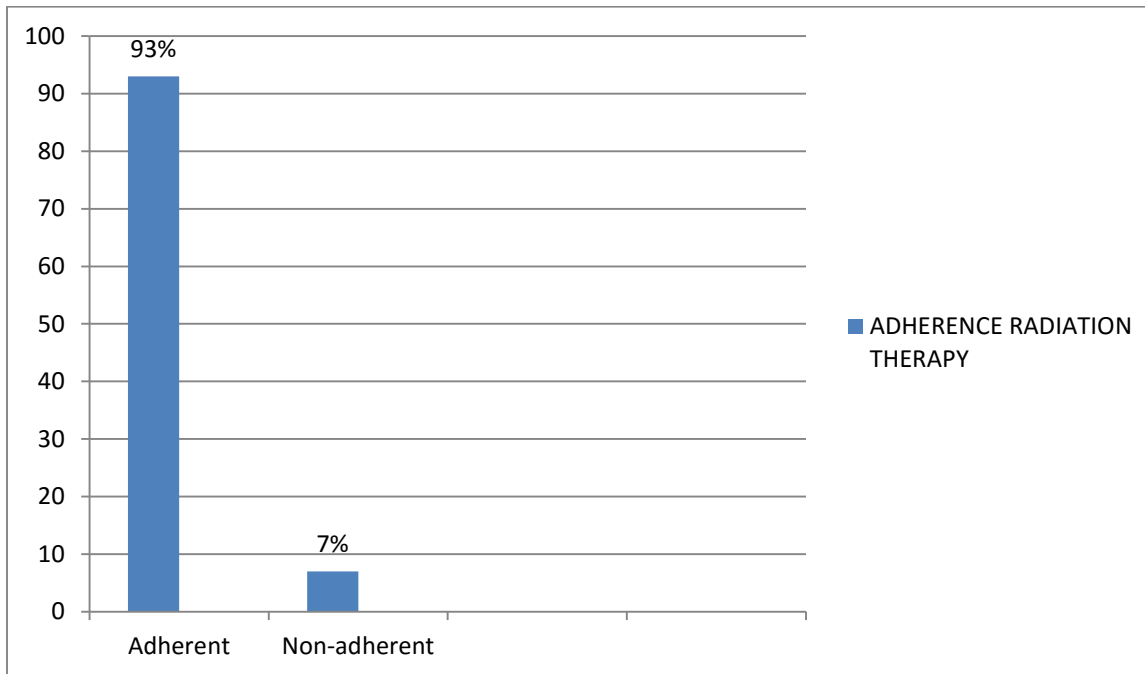


Figure 4.1 shows that the majority 93% of the patients adhered to RT while 7% did not adhere to radiation therapy treatment.

**Table 4.2: Reasons for Non-adherence to radiation therapy (n=10)**

Characteristics	Frequency
Miss RT due to machine breakdown	6
Miss RT due to health problems	1
Miss RT due to COVID 19	2
Miss RT due to missing file	1
<b>Total</b>	10

Table 4.2 shows that 10 of the participants missed RT; six of the participants could not manage to adhere due to machine break down while 2 were due to COVID 19 outbreak and the other 2 participants missed RT due to health complications and missing patient files. Percentages could not be used because in statistics numbers less than 30 when reported in percentages can be misleading (Durrheim and Tredoux, 2004).

#### 4.6 PSYCHOLOGICAL DISTRESS

**Table 4.3: Psychological distress while on Radiation Therapy (n=142)**

Characteristics	Frequency	Percentage
Loss of interest in life during RT	16	11.3%
Sleeping difficulties during RT	25	17.6%
Suicidal thoughts during RT	2	1.4%
Anxiety during RT	39	27.5%
Depression during RT	30	21.1%
Loss of intimacy during RT	138	97.2%
Frustration during RT	27	19.0%
Sadness during RT	33	23.2%
Affected by appearance during RT	44	31%

Table 4.3: shows that almost all the 97.2% participants had loss of intimacy when receiving RT. About 27.5% of the patients had experienced anxiety when receiving RT while 21.1% were depressed. About 17.6% experienced sleeping difficulties when receiving RT, 11.3% of the participants had loss of interest in life, while. Only 1.4% had suicidal thoughts when receiving radiation therapy treatment.

**Table 4.4: Overall psychological distress among patients receiving radiation therapy (n=142)**

<b>Characteristics</b>	<b>Frequency</b>	<b>Percentage</b>
No distress	85	59.9%
Mild distress	17	11.9%
Severe distress	40	28.2%
<b>Total</b>	142	100%

Table 4.4: shows the overall assessments of patients psychological distress when receiving RT, were 59.9% of the patients did not experience any distress. The table also shows that 28.2% experienced severe distress while 11.9% experienced mild distress.

#### **4.7 HEALTH CARE SYSTEM**

**Table 4.5: Perceived characteristics of quality of health care services (n=142)**

<b>Characteristics</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Good quality of health care services.</b>	134	94%
<b>Poor quality of health care services</b>	8	6%

The table above shows that 134 (94%) participants perceived the health care system to be of good quality while 8 (6%) perceived it to be of poor quality.

#### 4.8 STAGE OF CERVICAL CANCER

**Table 4.6: Stage of cervical cancer (n = 142)**

Stage of disease	Frequency	Percentage
Stage 1	17	12%
Stage 2	85	60%
Stage 3	40	28%
<b>Total</b>	<b>142</b>	<b>100%</b>

Figure 4.4; Shows that 60.6% of the patients were in stage II when receiving RT, while 27.7% were in stage III. Only 12.0% of the patients were in stage I when receiving radiation therapy.

#### 4.9 SIDE EFFECTS OF RADIATION THERAPY

**Table 4.7: Side effects of radiation therapy treatment (n = 142)**

Characteristics	Frequency	Percentage
Mild	6	4.2%
Moderate	35	24.6%
Severe	101	71.1%
<b>Total</b>	<b>142</b>	<b>100%</b>

More than half of the participants 71.1 % reported to have had severe side effects of radiation therapy, while 24.6% indicated that they had moderate side effects and only 4.2% reported having mild side effects of radiation therapy.

#### 4.10 THE RELATIONSHIP BETWEEN ADHERENCE TO RT AMONG CACX PATIENTS AND DEMOGRAPHIC FACTORS

**Table 4.8: The relationship between adherence to RT among CaCx patients and demographic characteristics (n=142) using a cross tabulation analysis.**

DEMOGRAPHIC CHARACTERISTICS		ADHERENCE TO RT		P-VALUE
		Adherent	Non-adherent	
<b>Age</b>	18-30 years	4(100%)	0(0%)	0.678
	31-50 years	74(93.7%)	5(6.3%)	
	51-70 years	49(92.5%)	4(7.5%)	
	71-90 years	5(83.3%)	1(16.7%)	
<b>Marital status</b>	Single	16(94.1%)	1(5.9%)	0.111
	Married	71(94.7%)	4(5.3%)	
	Divorced	8(72.7%)	3(27.3%)	
	Widowed	37(94.9%)	2(5.1%)	
<b>Education</b>	No formal education	9(100%)	0(0%)	0.557
	Primary	60(90.9%)	6(9.1%)	
	secondary	47(95.9%)	2(4.1%)	
	Tertiary	16(88.9%)	2(11.1%)	

Table 4.8; Shows that demographic characteristics (age, marital Status, education level) were not statistically significantly associated to adherence to RT.

#### 4.11 THE RELATIONSHIP BETWEEN ADHERENCE TO RT AND OTHER FACTORS

**Table 4.9: The relationship between adherence to RT and other factors (n=142) using a cross tabulation analysis.**

Characteristics		Adherence to RT		P value
		Adherent	Non-adherent	
<b>Economic status (Monthly income)</b>	<K 1000	77(93.9%)	5(6.1%)	0.349
	K1000 – K3000	28(96.6%)	1(3.4%)	
	K3000- K5000	17(89.5%)	2(10.5%)	
	>K5000	10(83.3%)	2(16.7%)	
<b>Stage of disease at diagnosis</b>	Stage I	16(94.1%)	1(5.9%)	1.000
	Stage II	79(92.3%)	6(7.1%)	
	Stage III	37(92.5%)	3(7.5%)	
<b>Side effects</b>	Mild	5(83.3%)	1(16.7%)	0.347
	Moderate	32(91.4%)	3(8.6%)	
	Severe	95(94.1%)	6(5.9%)	
<b>Psychological distress</b>	No distress	79(92.9%)	6(7.1%)	1.000
	Mild distress	16(94.1%)	1(5.9%)	
	Severe distress	37(92.5%)	3(7.5%)	
<b>Perceived quality of Health care services</b>	Good	132(98.5%)	2(1.5%)	0.001
	Poor	0(0%)	8(100%)	

Table 4.9: Shows that there was a statistically significant association between adherence to RT treatment and the perceived quality of health care services as all the 8 participants who perceived

quality of health care services to be poor did not adhere to RT. However, there were no statistically significant association between adherence to RT and economic status, stage of disease, side effects and psychological distress.

#### 4.12 BINARY LOGISTIC REGRESSION

**Table 4.8: Binary logistic regression analysis of the effect of psychological distress, perceived quality of healthcare services and disease stage on RT adherence.**

Variables	Indicators	Adjusted estimates			
		Odds Ratio	95% CI		p-value
			Lower	Upper	
Level of psychological distress	No distress	Ref			
	Mild	2.85	0.109	74.12	0.528
	Severe	6.89	0.418	113.6	0.177
Perceived quality of healthcare	Good	Ref			
	Poor	0.005	0.004	0.062	<0.001
Disease stage at diagnosis	Stage I	Ref			
	Stage II	0.34	0.010	11.44	0.546
	Stage III	0.48	0.011	20.21	0.698

CI= Confidence Interval

Binary logistic regression analysis showed that holding other variables constant, patients who perceived to have received poor quality of health care services were 0.005 (99.5%) times less likely to adhere to RT treatment compared to those who had perceived to have received good healthcare services, and this effect was highly significant (OR: 0.005, CI: 0.004 – 0.062, P: <0.001). Further analysis showed that, patients with mild (OR: 2.9, CI: 0.11 – 74.1, P: 0.528) and severe (OR: 6.9, CI: 0.42 – 113.6, P: 0.177) psychological distress had increased odds of RT adherence. Similarly the predictive effect of stage of disease at diagnosis on RT adherence was not statistically significant, although patients diagnosed with stage II (OR: 0.34, CI: 0.01 – 11.4, P: 0.546) and stage III (OR: 0.48, CI: 0.011 – 20.21, P: 0.69) cancer showed lower odds of RT adherence than patients diagnosed with stage I cancer.

## **CHAPTER FIVE: DISCUSSION OF THE FINDINGS**

### **5.1 INTRODUCTION**

This chapter discusses the results of the study on adherence to radiation therapy treatment among CaCx patients at CDH-Lusaka, Zambia. Adherence to radiation therapy is cardinal in curing and prolonging survival in women affected with CaCx. This study assessed adherence to radiation therapy treatment among 142 patients who had undergone RT at CDH, in Lusaka Zambia from the period of 2015 to 2020. For this study adherence to radiation therapy meant to strictly follow health care providers recommended instructions such as receiving all the prescribed fractions of radiation therapy treatment without any interruptions and keeping appointment dates, .e.g. completing the radiation therapy of 30 days 46 grays as prescribed by an oncologist within the prescribed period of time without rescheduling or re-starting the RT fractions.

### **5.2 DEMOGRAPHIC CHARACTERISTICS**

From the findings more than half of the participants were in the age range of 31-50 years, this was expected as cervical cancer is common in the age group above 30. The prevalence of cervical cancer is higher among patients aged 30 years and above than those younger than 30 years, (Muntanga and Silwanga, 2019). This was in agreement to Duska, (2016), who found that cervical cancer continues to be a cancer affecting women of reproductive age group, He pointed out that cervical cancer was the most common gynecological cancer in women of 35 years and above (Duska, 2016). The finding that most women in the middle age (55%) were diagnosed with cervical cancer is similar to a study conducted by (Gebremariam et al., 2019). Gebremariam *et al.*, (2019), which revealed that most cervical cancer cases in women frequently occur in the middle age of which these are the same patients who are in the workforce, child bearing age, raising children and supporting other family members. In this study age was not significantly related to adherence to RT among cervical cancer patients at CDH as majority of the patients adhered to RT regardless of their age group. Contrary to a study conducted by Njuguna, (2017), he indicated that the age of patients is an important determinant of adherence to cancer treatment.

In this study marital status was not significantly related to RT adherence among the participants as majority of them both single and married women had adhered to RT, on the contrary (Suubi Muliira et al., 2016) observed that mortality rates of cervical cancer patients were higher among women who were never married, than those married. For Suubi Muliira et al., (2016) they thought marriage indicated an important form of social support for the their participants as well as management of the disease. They further explained that women who were married could have had financial support to have access to medical care including encouragement from their partners while undergoing RT. The support from their spouses would eventually lead to adherence therefore contributing to an improved treatment outcome.

The findings of this study showed that most of the participants had adhered to RT, even though most of them had a low economic status. This contradicts a study which reported financial difficulties as one of the top reasons for abandonment of treatment to RT (Kamanda, 2016). Njuguna, (2017) also found out that financial difficulties were the leading cause of treatment abandonment in some patients. A study conducted by the (Koh et al., 2019) revealed that multiple reports have highlighted the cost of cancer drugs and machines as a financial burden to patients receiving treatment. This is because cancer treatment is most often placed on the highest cost-sharing. Njuguna, (2017) also discovered that there was a close association between occupation and adherence. The cost associated with cervical cancer was relatively expensive beyond the reach of an average patient. Another study also explained that they are varied costs that can be incurred during RT, ranging from medical related expenses, the cost associated with travelling to and from the hospital, increase in household bills due to special meals and support that might cause patients not to adhere to RT, (Funsani, 2016) .

The results revealed that most of the (57.7%) participants in this study had adhered to radiation therapy regardless of their low economic status. This could be due to the fact that the hospital admits patients who come from remote distant places to lodge until the time they complete their treatment as well as provide for all the meals and other medical related expenses. This is contrarily to a Nigerian study which showed that financial

considerations are vital in the uptake of treatment; it was revealed that for the (95%) participants referred to undergo RT, only (19%) of them actually underwent the process while (81%) did not undergo the process for lack on financial assistance. Hence they noted that all patients who underwent radiotherapy were classified to belong to higher social class compared to those who did not attend RT (Koh et al., 2019).

### **5.3 ADHERENCE TO RADIATION THERAPY AMONG CERVICAL CANCER PATIENTS**

The results of this study revealed that (93%) of the patients adhered to RT while only (7%) did not adhere to treatment. Almost all the patients in this study scored above 3 out of 7 using the modified brief adherence medication Scale.

The level of adherence was surprisingly high compared to what was observed at the time of conceptualizing the study. One possible reason for the observed difference could be that the accessible population was limited because data collection was conducted during the Peak of the COVID-19 Pandemic. During this time there were travel restrictions and some patients were restricted from accessing hospital facilities a measure which was put by the hospital management to minimize the spread of Corona Virus. Probably what could have changed the situation is that the study was conducted in short period of time were as the observation for non-compliance was observed over a long duration. If the study was to be conducted over a long duration, probably the results could have been different. Similarly a study conducted in the United States of America showed that the assumption they had at the beginning of the study was totally different from the results they obtained (Daniel, 2011) such that they alluded the change in their results to the short duration in which their study was conducted. Another reason could be that most of the patients interviewed had good moral, spiritual, physical and emotional support from their families, church denominations and significant others.

The results for this study were a mismatch to what Likhacheva et al., (2020) in a study conducted in America. They indicated that radiotherapy was very effective, but adherence to the treatment was poor with only (52.4%) of women completing the prescribed radical radiotherapy. (Likhacheva et al., 2020) also noted that adherence to treatment was very significant though it had ubiquitous medical problem as well as a

complex, multidimensional behavioral change process. They concluded that the failure to adhere reasonably well to treatment regimen by cervical cancer patients diminishes the full therapeutic benefit, hence if patients do not adhere they risk having worsening disease or death.

The (7%) that did not adhere to RT attributed it to experiencing poor health care services specifically the RT machine breakdown and COVID 19 outbreak. These factors interrupted the participant's schedule of treatment as they had stopped receiving RT for quite some time waiting for the machines to be fixed as well as the institution to establish a workable schedule which could allow health workers to work amidst the pandemic in a safest possible way while preventing transmission of the virus. Only one patient had missed treatment due to poor health condition, the participant was extremely sick and had multiple organ failure hence could not continue due to poor conditional health state. Mapanga et al., (2020) also found out that some of the reasons some patients who could not adhere to radiation therapy in their study were actually due to health care systems.

#### **5.4 PSYCHOLOGICAL DISTRESS**

The findings of this study showed that a significant number of participants had experienced psychological distress. This may affect the course of the disease, mental and physical status as most cancer patients are known to have a higher level of anxiety than patients with other diseases. Even though very few (1.4%) of patients experienced anxiety in their study, they saw it as a representation of a specific mental state of increased vigilance and prudence in anticipation of unpleasant events without the presence of real danger. Similarly to this study, Radojevic *et al.*, (2017) found that radiation therapy treatment is likely to initiate mental and physical stress to patients such as anxiety, growing anger and hostility, and reduce quality of they also discovered that some patients treated with RT experienced serious psychological reactions that may manifest as fear of RT, and may have significantly affected their compliance towards RT. As can be seen from the findings of this study in table 4.2 and 4.3; most of the participants (59.9%) experienced no psychological distress. In this study, psychological

distress was assessed using a verified modified screening distress survey tool (Bodnarchuk et al., 2014).

The study results showed that only (28.2%) of the patients had experienced severe psychological distress while majority of them reported that they had not experienced any psychological distress. This can be as a result of prior counseling which all patients receive before they start receiving their radiation therapy. Most of them explained that they were not affected psychologically because the treatment process and expected side effects were explained to them by the health care providers hence they expected to experience some degree of side effects when receiving RT. However some of the patients who had experienced psychological distress during the time they were receiving radiation therapy, explained that this was as a result of severe side effects they experienced at that time.

Findings of this study are similar to the findings of Pfaendler *et al*, (2015) as some of the participants had mood disorders, loss of body image and loss of interest in intimacy due to the side effects they experienced from radiation therapy treatment. In a study conducted by (Suubi Muliira et al, 2016) it was observed that the relationship between appointment attendance and the psychosocial factors may interfere with a cancer patient's ability to engage in adherence behaviors. They established that psychological factors are more likely to cause an impact on patient's adherence behaviors. They also discovered that gynecological cancers can harm all four stages of female sexual response namely sexual desire, excitement, orgasm and sexual response, this finding is very true as majority of the participants (97.2%) in this study had experienced loss of intimacy during RT. This simply means that there is a great need for psychological counseling as it is a very sensitive to topic and the patients may find it beneficial to discuss sensitive psychosexual issues in a psychotherapeutic environment with a psychologist, palliative care nurses, nurses, and doctors.

This can serve as an effective intervention to improve sexual well-being among gynecological patients thus enhancing their quality of life (Suubi Muliira et al, 2016).

Radojevic *et al.*, (2017), also discovered that the effects of radiation therapy during treatment could not be felt but most patients had symptoms of psychological discomfort caused by fear. They noted that patients who showed a lower level of anxiety before exposure to RT are characterized by greater anxiety during and or after RT, and vice versa. Another study conducted by (Pfaendler *et al.*, 2015) showed that psychosocial problems affecting the quality of life of cervical cancer survivors included mood and stress disorders, body image and fear of recurrence.

## **5.5 PERCEIVED QUALITY OF HEALTH CARE SERVICES**

From this study (10 of the participants with poor adherence to RT perceived to have had experienced poor quality of health care services, reasons for poor adherence can be clearly seen from table 4.2 that 6 participants missed treatment due to the machine breakdown, (2 participants missed RT due to COVID 19 outbreak, 2 participants missed RT due to missing file and health related problems respectively. Majority 93% of the participants had perceived to have received good health care services and completed their prescribed treatment to RT successfully. These findings are not consistent with what Njuguna, (2017), who in his study discovered that they were several treatment related factors that affected adherence. These factors included the characteristics of the prescribed treatment and type of health care services offered among others; he further explained that the health care providers also significantly play a major role to determine how well the prescribed treatment might be adhered to.

In another study conducted by (Ferreira da Silva *et al.*, 2019) they observed that some health care services such as the time for treatment initiation mostly depended on staging of the disease, treatment protocol definition, and the pre-radiation therapy referral, which included appraisal and pre chemo radiation tests. Hence they concluded that treatment adequacy was highly associated with treatment delay resulting to poor provision of health care services.

Table 4.7 shows that there was a statistically significant association between adherence to RT treatment and the health care systems as all the participants who reported to have experienced poor health care systems did not adhere to RT. This is similar with the study

conducted by (Moelle et al.,2018), who indicated that the health care system was mainly associated with patient's non-adherence to RT. This was as a result of patients having follow-up appointments with a general practitioner instead of an oncologist, patients receiving misinformation about the RT treatment from the physician and long waiting times in the OPD clinics. In another study conducted by Diaz *et al.*, (2015), they observed that some factors such as missing appointments with physicians, prolonged time of receiving RT and poor understanding of treatment advantages significantly affected patient's treatment adherence. In another study conducted by (Lohlun et al., 2015), some participants cited reasons for missing treatment due to lack of transportation, patient refusal to continue with RT and machine breakdown. In this study the other remaining factors which include economic status, stage of disease, side effects and psychological distress ( $p > 0.05$ ) had no statistically significant association with adherence to RT.

## **5.6 STAGE OF CERVICAL CANCER**

In this study the peak of the stage of CaCx is similar to other studies conducted in developing countries (Kamnda, 2017). According to figure 4.5, all the study participants had FIGO staging to determine the extent of the disease. The results showed that (85%) patients were in stage II when receiving RT, while (40%) of them were in stage III. Only (17%) of the patients were in stage I when receiving radiation therapy treatment. Most of the study participants were in stage II representing (85%) of the clients, this is similar to what Kamnda, (2017) also found out. Most of the participants were in stage 2 representing (80.5%). The results also indicated that the stage at diagnosis was not significantly associated with adherence. The findings of this study are therefore contrary to those by Njuguna, (2017) who indicated that the stage of disease at diagnosis affects adherence and when patients present with advanced stages of cancer, as often is the case in low and middle-income countries, their prognosis decreases. The poor prognosis and associated higher treatment costs can discourage the participants to adhere to treatment. Late stage of disease usually requires more intensive treatment in order to achieve cure of which the intense treatment causes more adverse effects which can lead to poor adherence (Chiew et al., 2017).

## **5.7 SIDE EFFECTS OF RADIATION THERAPY**

Despite RT being very effective, evidence has shown that those undergoing radiotherapy present with acute skin toxicity and acute gastrointestinal toxicity (Kamnda 2017). Majority of the participants (99.9%) in this study had experienced skin toxicity; however the side effects did not have a negative effect on adherence to RT as 93% of the patients adhered to treatment despite experiencing skin toxicity and other side effects. Similar studies showed that skin reactions are more common when receiving RT as 10% to 50% incidence rates were being reported (Kamnda 2017). Furthermore the findings of the study indicated that 71.1% of participants reporting having had experienced severe side effects. These finding are similar to a study that was conducted in Kenya which showed that there was a 7-fold higher risk of developing multi-system skin, gastrointestinal, and genitourinary toxicity after undergoing RT (Mapanga *et al.*, 2020). Another study showed that cervical cancer patients receiving RT typically reported worse side effects (Pfaendler *et al.*, 2015)

## **5.8 RELATIONSHIP BETWEEN ADHERENCE TO RADIATION THERAPY AND DEMOGRAPHIC FACTORS**

Table 4.6 shows the relationship between adherence to RT and of demographic characteristics (age, marital status, education level). From the results there was no significant association between adherence to RT ( $p > 0.05$ ) and demographic factors. According to the study conducted by (Kamnda ,2017), age had a significant effect to adherence to RT which is contrary to this study as majority of patients adhered to RT regardless of their age group.

In addition education had no significant effect on adherence to RT as (93%) of participants adhered to RT regardless of their level of education, this seems to differ with Kamnda (2017) who found out that the level of education had a significant positive effect on adherence to RT, in his findings he alluded that patients with tertiary education were

adherent to RT compared to those who had no formal education. Marital status also played no significant role in patients adhering to RT.

### **5.10 BINARY LOGISTIC REGRESSION**

The binary logistic regression test was used to analyze the combined impact of dependent (adherence to RT) and independent variables (health care system), (psychological distress) and (stage of disease). All variables (dependent and independent variables) were coded. The results of the logistic regression analysis showed that holding other variables constant, patients who had perceived to have received poor quality of healthcare services were 0.005 (99.5%) times less likely to adhere to RT treatment compared to those who had a perceived receiving good quality of healthcare care services received, this effect was highly significant with the odds ratio of (OR: 0.005, CI: 0.004 – 0.062, P: <0.001). Further analysis showed that, controlling for the perceived quality of healthcare services and the stage of disease at diagnosis, patients who had experienced mild psychological distress and severe psychological distress had increased odds of RT adherence compared to patients with no psychological distress. However, this effect was not statistically significant. Similarly, taking other variables into account, the predictive effect of the cervical cancer stage at diagnosis on RT adherence was not statistically significant, although patients diagnosed with stage II cervical cancer and stage III cervical cancer showed lower odds of RT adherence than patients diagnosed with stage I cervical cancer. Therefore the effect of perceived quality of health care services was statistically significant ( $p < 0.001$ ), implying that participants are likely to adhere to RT when provided with good quality of health care services such as good maintenance of machines and minimal abrupt stoppages to treatment schedules (Moelle et al., 2018).

### **5.11 CONCLUSION**

The main objective of the study was to assess the level of adherence factors associated with adherence to radiation therapy treatment among cervical cancer patients at Cancer Diseases Hospital Lusaka, Zambia. The specific objectives were to measure the levels of adherence to radiation therapy by cervical cancer patients and to identify factors associated with adherence to radiation therapy among cervical cancer patients. The study

identified one factor (perceived quality of health care services) as being significant in influencing adherence to RT. This implies that in order to strengthen adherence to RT, there is need for quality service provision which could include good maintenance of radiation machines. Furthermore the hospital should develop guidelines for follow up in case of any disease outbreak so as not interfere with patient's treatment schedules and appointments for reviews.

## **5.12 LIMITATIONS OF THE STUDY**

**The following was the limitation of this study:**

This was a quantitative study; therefore in depth information on factors that could affect adherence to RT from the patients' perspective could not be explored.

## **5.13 IMPLICATIONS OF THIS STUDY TO NURSING**

**Significance of the study to Nursing**

### **5.13.0 Nursing Practice**

Nurses are the backbone of health care systems in Zambia and play a leading role in the delivery of quality health care services. The study results showed that (28.2%) of patients had experienced severe psychological distress, this clearly indicates that health care professionals especially nurses need to counsel these patients, as pain and length of treatment may affect adherence. Therefore there is need to understand the impact of radiation therapy among cervical cancer patients on their physical, psychological, social, sexual, emotional and spiritual well-being and their effect on adherence to RT.

### **5.13.2 Nursing Administration**

The CDH management/ administration have a role in carrying out their management functions such as planning, organizing, controlling and delegating. The findings of this study in unit 5.4 indicated that a significant number of participants (38) had experienced severe psychological distress which affects the

course of the disease, mental and physical status as most cancer patients are known to have a higher level of anxiety than patients with other diseases.

Therefore, it is important that they should introduce refresher courses for nurses, doctors and radiotherapist on palliative care and psychosocial counseling so that sufficient information and counseling will be given to the patients at all times to help improve their psychological wellbeing.

### **5.13.3 Nursing Education**

The study showed that some patients had experienced psychological distress. Hence pointing out an urgent need to train more nurses in oncology nursing, palliative care and psychosocial counseling. Therefore it would be desirable that all the nursing schools curricula in Zambia should include oncology nursing, palliative care and psychosocial counseling in the management of cancer patients. The current curriculum for RN diploma does not cover the above mentioned aspects of care.

### **5.13.4 Research**

Currently no research has been conducted on adherence to RT treatment among cervical cancer patients in Zambia. It is therefore important that further research studies are carried out on a large scale to investigate effects RT on cancer patients as this will help to identify the most the challenges cancer patients experience due to RT and also come up with recommendations on how to curb them and in turn help provide quality management of cancer patients undergoing RT.

## **5.14 RECOMMENDATIONS**

1. There should be close monitoring of patients in order to avoid treatment disruptions in case of any disease outbreak e.g. Covid 19 to avoid interfering with patient's treatment schedules and appointments for reviews.
2. There should be good maintenance of machines as majority of the patients who missed treatment was due to machine breakdown

#### **5.14 UTILIZATION OF RESULTS**

The study findings will be used to make recommendations to the CDH management, policy makers and other stakeholders, on how adherence to RT can be improved among cervical cancer patients.

It may also help in formulating strategies on how to deal with factors affecting adherence as well as help in coming up with recommendations to use when giving information, education and communication to cervical cancer patients.

#### **5.15 DISSEMINATION OF FINDINGS**

The findings of this study will be disseminated as dissertations submitted to the University of Zambia, School of Medicine Library, School of Nursing Sciences repository, CDH and MOH. The findings will also be published in a reputable peer reviewed journal and presented at post graduate forum and professional conferences.

## REFERENCES

- ALMIGBAL, T. H., ALMUTAIRI, K. M., FU, J. B., VINLUAN, J. M., ALHELH, E., ALONAZI, W. B., BATAIS, M. A., ALODHAYANI, A. A. & MUBARAKI, M. A. 2019. Assessment of psychological distress among cancer patients undergoing radiotherapy in Saudi Arabia. *Psychol Res Behav Manag*, 12, 691-700.
- ANTONIO, M., CARMONA-BAYONAS, A., SALDANA, J., NAVARRO, V., TEBE, C., SALAZAR, R. & BORRAS, J. M. 2018. Factors Predicting Adherence to a Tailored-Dose Adjuvant Treatment on the Basis of Geriatric Assessment in Elderly People With Colorectal Cancer: A Prospective Study. *Clin Colorectal Cancer*, 17, e59-e68.
- BEAVIS, A. L., GRAVITT, P. E. & ROSITCH, A. F. 2017. Hysterectomy-corrected cervical cancer mortality rates reveal a larger racial disparity in the United States. *Cancer*, 123, 1044-1050.
- BEREK, J. S., MATSUO, K., GRUBBS, B. H., GAFFNEY, D. K., LEE, S. I., KILCOYNE, A., CHEON, G. J., YOO, C. W., LI, L., SHAO, Y., CHEN, T., KIM, M. & MIKAMI, M. 2019. Multidisciplinary perspectives on newly revised 2018 FIGO staging of cancer of the cervix uteri. *J Gynecol Oncol*, 30, e40.
- BERRY, D. L., BLONQUIST, T. M., HONG, F., HALPENNY, B. & PARTRIDGE, A. H. 2015. Self-reported adherence to oral cancer therapy: relationships with symptom distress, depression, and personal characteristics. *Patient Prefer Adherence*, 9, 1587-92.
- BHATLA, N., AOKI, D., SHARMA, D. N. & SANKARANARAYANAN, R. 2018. Cancer of the cervix uteri. *Int J Gynaecol Obstet*, 143 Suppl 2, 22-36.
- BLACK, E. & RICHMOND, R. 2018. Prevention of Cervical Cancer in Sub-Saharan Africa: The Advantages and Challenges of HPV Vaccination. *Vaccines (Basel)*, 6.
- BODNARCHUK, T., STAVROU, S. & GANTEFOER, A. 2014. Screening for Distress in the Radiation Therapy Department: Distress Incidence by Sex, Treatment Intent, and Ethnicity. *J Med Imaging Radiat Sci*, 45, 99-104.
- BRAY, F., FERLAY, J., SOERJOMATARAM, I., SIEGEL, R. L., TORRE, L. A. & JEMAL, A. 2018. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin*, 68, 394-424.
- CHANDA, E., AZANGWE, G. & BWANGA, O. 2019. Brachytherapy Doses and Late Rectal and Bladder Toxicities for Cervical Cancer Patients: A Case Study of a Radiotherapy Centre in Zambia. *South Asian Research Journal of Pharmaceutical Sciences*, 01, 38-47.
- CHIEW, K. L., CHONG, S., DUGGAN, K. J., KAADAN, N. & VINOD, S. K. 2017. Assessing guideline adherence and patient outcomes in cervical cancer. *Asia Pac J Clin Oncol*, 13, e373-e380.
- CHO, O. & CHUN, M. 2018. Management for locally advanced cervical cancer: new trends and controversial issues. *Radiat Oncol J*, 36, 254-264.
- DEGU, A., NJOGU, P., WERU, I. & KARIMI, P. 2017. Assessment of drug therapy problems among patients with cervical cancer at Kenyatta National Hospital, Kenya. *Gynecol Oncol Res Pract*, 4, 15.
- DURRHEIM, K. & TREDOUX, C. 2004. *Numbers, hypotheses & conclusions: A course in statistics for the social sciences*, Juta and Company Ltd.
- DUSKA, L. R. 2016. Cervical Cancer: The Next Generation of Prevention, Detection, and Treatment. *Clin Ther*, 38, 446-8.

- ELSNER, K., NAEHRIG, D., HALKETT, G. K. B. & DHILLON, H. M. 2017. Reduced patient anxiety as a result of radiation therapist-led psychosocial support: a systematic review. *J Med Radiat Sci*, 64, 220-231.
- FERREIRA DA SILVA, I., FERREIRA DA SILVA, I. & KOIFMAN, R. J. 2019. Cervical Cancer Treatment Delays and Associated Factors in a Cohort of Women From a Developing Country. *J Glob Oncol*, 5, 1-11.
- GEBREMARIAM, A., ADDISSIE, A., WORKU, A., HIRPA, S., ASSEFA, M., PACE, L. E., KANTELHARDT, E. J. & JEMAL, A. 2019. Breast and cervical cancer patients' experience in Addis Ababa city, Ethiopia: a follow-up study protocol. *BMJ Open*, 9, e027034.
- GINSBURG, O., BRAY, F., COLEMAN, M. P., VANDERPUYE, V., ENIU, A., KOTHA, S. R., SARKER, M., HUONG, T. T., ALLEMANI, C., DVALADZE, A., GRALOW, J., YEATES, K., TAYLOR, C., OOMMAN, N., KRISHNAN, S., SULLIVAN, R., KOMBE, D., BLAS, M. M., PARHAM, G., KASSAMI, N. & CONTEH, L. 2017. The global burden of women's cancers: a grand challenge in global health. *The Lancet*, 389, 847-860.
- GIZAW, M., ADDISSIE, A., GETACHEW, S., AYELE, W., MITIKU, I., MOELLE, U., YUSUF, T., BEGOIHN, M., ASSEFA, M., JEMAL, A. & KANTELHARDT, E. J. 2017. Cervical cancer patients presentation and survival in the only oncology referral hospital, Ethiopia: a retrospective cohort study. *Infect Agent Cancer*, 12, 61.
- GONZALEZ-CABRERA, M., ORTEGA-MARTINEZ, A. R., MARTINEZ-GALIANO, J. M., HERNANDEZ-MARTINEZ, A., PARRA-ANGUITA, L. & FRIAS-OSUNA, A. 2020. Design and Validation of a Questionnaire on Communicating Bad News in Nursing: A Pilot Study. *Int J Environ Res Public Health*, 17.
- HUA, Z., DAVID, A. J. T. B. G. T. R. M. I. B. & MULTILINGUALISM 2008. Study design: Cross-sectional, longitudinal, case, and group. 88-107.
- KALUBULA, M., SHEN, H., MAKASA, M. & LIU, L. 2018.
- KAMANDA, M. I. 2016. *Determinants of factors affecting adherence to radiotherapy treatment among patients with cervical cancer at the MP Shah hospital*. University of Nairobi.
- KOH, W. J., ABU-RUSTUM, N. R., BEAN, S., BRADLEY, K., CAMPOS, S. M., CHO, K. R., CHON, H. S., CHU, C., CLARK, R., COHN, D., CRISPENS, M. A., DAMAST, S., DORIGO, O., EIFEL, P. J., FISHER, C. M., FREDERICK, P., GAFFNEY, D. K., HAN, E., HUH, W. K., LURAIN, J. R., MARIANI, A., MUTCH, D., NAGEL, C., NEKHLIYUDOV, L., FADER, A. N., REMMENG, S. W., REYNOLDS, R. K., TILLMANN, T., UEDA, S., WYSE, E., YASHAR, C. M., MCMILLIAN, N. R. & SCAVONE, J. L. 2019. Cervical Cancer, Version 3.2019, NCCN Clinical Practice Guidelines in Oncology. *J Natl Compr Canc Netw*, 17, 64-84.
- KUMAR, A., TUDU, R., KUMARI, T. & SAHOO, S. K. 2017. Compliance to Head and Neck Radiotherapy in Our Patient Population. *IOSR Journal of Dental and Medical Sciences*, 16, 48-52.
- LESSA, P. R., RIBEIRO, S. G., AQUINO PDE, S., DE ALMEIDA, P. C. & PINHEIRO, A. K. 2015. Validation of the Adherence Determinants Questionnaire scale among women with breast and cervical cancer. *Rev Lat Am Enfermagem*, 23, 971-8.
- LIKHACHEVA, A., AWAN, M., BARKER, C. A., BHATNAGAR, A., BRADFIELD, L., BRADY, M. S., BUZUROVIC, I., GEIGER, J. L., PARVATHANENI, U., ZAKY, S. & DEVLIN, P. M. 2020. Definitive and Postoperative Radiation Therapy for Basal and

- Squamous Cell Cancers of the Skin: Executive Summary of an American Society for Radiation Oncology Clinical Practice Guideline. *Pract Radiat Oncol*, 10, 8-20.
- LOHLUN, K. N., KOTZEN, J. A. & LAKIER, R. 2015. A prospective study on the impact of waiting times for radiotherapy for cervical cancer at Charlotte Maxeke Johannesburg Academic Hospital. *South African Journal of Obstetrics and Gynaecology*, 21.
- MAPANGA, W., SINGH, E., FERESU, S. A. & GIRDLER-BROWN, B. 2020. Treatment of pre- and confirmed cervical cancer in HIV-seropositive women from developing countries: a systematic review. *Syst Rev*, 9, 79.
- MATSUO, K., MACHIDA, H., MANDELBAUM, R. S., KONISHI, I. & MIKAMI, M. 2019. Validation of the 2018 FIGO cervical cancer staging system. *Gynecol Oncol*, 152, 87-93.
- MOELLE, U., MATHEWOS, A., AYNALEM, A., WONDEMAGEGNEHU, T., YONAS, B., BEGOIHN, M., ADDISSIE, A., UNVERZAGT, S., JEMAL, A., THOMSEN, C., VORDERMARK, D. & KANTELHARDT, E. J. 2018. Cervical Cancer in Ethiopia: The Effect of Adherence to Radiotherapy on Survival. *Oncologist*, 23, 1024-1032.
- PEDNEKAR, P. P., AGH, T., MALMENAS, M., RAVAL, A. D., BENNETT, B. M., BORAH, B. J., HUTCHINS, D. S., MANIAS, E., WILLIAMS, A. F., HILIGSMANN, M., TURCU-STIOLICA, A., ZEBER, J. E., ABRAHAMYAN, L., BUNZ, T. J. & PETERSON, A. M. 2019. Methods for Measuring Multiple Medication Adherence: A Systematic Review-Report of the ISPOR Medication Adherence and Persistence Special Interest Group. *Value Health*, 22, 139-156.
- PFAENDLER, K. S., WENZEL, L., MECHANIC, M. B. & PENNER, K. R. 2015. Cervical cancer survivorship: long-term quality of life and social support. *Clin Ther*, 37, 39-48.
- PIKALA, M., BURZYNSKA, M. & MANIECKA-BRYLA, I. 2019. Years of Life Lost Due to Cervical Cancer in Poland in 2000 to 2015. *Int J Environ Res Public Health*, 16.
- RANGARAJAN, R. & JAYARAMAN, K. 2017. Barriers affecting adherence to radiation treatment and strategies to overcome those barriers. *Indian J Cancer*, 54, 458-460.
- RADOJEVIC, M.Z., FOLIC, M., & JANKOVIC, S., 2017, the questionnaire for assessment fear of radiotherapy in oncology patients. Degruyter open 10.1515-0033.
- RUBINSAK, L. A., TERPLAN, M., MARTIN, C. E., FIELDS, E. C., MCGUIRE, W. P. & TEMKIN, S. M. 2019. Co-occurring substance use disorder: The impact on treatment adherence in women with locally advanced cervical cancer. *Gynecol Oncol Rep*, 28, 116-119.
- SHAH, M., KISHAN, D., SRIVASTAVA, K. & TIWARI, D. 2018. Cervical cancer analysis: From burden to treatment. *Asian Journal of Medical Sciences*, 10, 38-42.
- SHYU, I. L., HU, L. Y., CHEN, Y. J., WANG, P. H. & HUANG, B. S. 2019. Risk factors for developing depression in women with cervical cancer: a nationwide population-based study in Taiwan. *Int J Womens Health*, 11, 135-141.
- SUUBI, R. M., NATARAJAN, J., & VERGARA, G., 2016 A review of interventions to enhance the quality of life for gynaecological cancer patients Volume *Clin Obstet Gynecol Reprod Med*, 20162(5): 235-243
- SUNDARESAN, P., STOCKLER, M. R. & MILROSS, C. G. 2016. What is access to radiation therapy? A conceptual framework and review of influencing factors. *Aust Health Rev*, 40, 11-18.
- THAPA, N., MAHARJAN, M., XIONG, Y., JIANG, D., NGUYEN, T. P., PETRINI, M. A. & CAI, H. 2018. Impact of cervical cancer on quality of life of women in Hubei, China. *Sci Rep*, 8, 11993.

- TORRE, L. A., SIEGEL, R. L., WARD, E. M. & JEMAL, A. 2016. Global Cancer Incidence and Mortality Rates and Trends--An Update. *Cancer Epidemiol Biomarkers Prev*, 25, 16-27.
- TREJO, M. J., LISHIMPI, K., KALIMA, M., MWABA, C. K., BANDA, L., CHUBA, A., CHAMA, E., MSADABWE, S. C., BELL, M. L., HARRIS, R. B., JACOBS, E. & SOLIMAN, A. 2020. Effects of HIV status on non-metastatic cervical cancer progression among patients in Lusaka, Zambia. *Int J Gynecol Cancer*, 30, 613-618.
- VORA, C. & GUPTA, S. 2018. Targeted therapy in cervical cancer. *ESMO Open*, 3, e000462.
- ZAMORANO, A. S., BARNOYA, J., GHARZOUZI, E., CHRISMAN ROBBINS, C., OROZCO, E., POLO GUERRA, S. & MUTCH, D. G. 2019. Treatment Compliance as a Major Barrier to Optimal Cervical Cancer Treatment in Guatemala. *J Glob Oncol*, 5, 1-5.

## **APPENDIX I: PATIENT INFORMATION SHEET**

### **1. Self-introduction**

My name is Etambuyu Akufuna, pursuing a Master's of Science in clinical Nursing at the University of Zambia School of nursing sciences. I am kindly requesting for your participation in the above-mentioned research study, to assess adherence to radiation therapy treatment among cervical cancer patients. Your participation in this study is purely voluntary. You may choose to or not to participate. Even after you have joined the study you are free to withdraw as you wish, and that will not affect your access to health services from this institution. If you are willing to participate, you will be requested to sign a consent form to indicate that you agree to participate. Please ask where you do not understand and you will be explained to in simpler terms.

### **2. Title of study**

Adherence to Radiation Therapy Treatment among Cervical Cancer patients at Cancer Diseases Hospital.

### **3. Purpose of the study**

The study will assess patients' adherence to radiation therapy among cervical cancer patients at Cancer Diseases Hospital. The information that will be obtained will help the policy makers and implementers of the programme in the MOH to strengthen treatment protocols of cervical cancer patients in Zambia.

### **4. Procedure**

The study will involve a face-to-face interview with the researcher and research assistants who will ask you a set of questions using an interview schedule. After signing the consent form, the research assistants will proceed to ask you relevant questions and your responses will be recorded on the questionnaire. The interview will take about 25-30 minutes.

### **5. Voluntariness**

Your participation in this research is entirely voluntary. You will not be forced to participate if you do not wish to do so. You are assured that your refusal to take part will not in any way result in loss of access to health services to which you are entitled to at this institution. If you decide to

take part, you will still be free to withdraw at any time without giving prior reason for your withdrawal. You will further, have the right to end the interview at any time, and to choose not to answer questions that may make you uncomfortable.

## **6. Data management and storage**

The research records and any information pertaining this study will be confidential to the extent permitted by law. The data will be safely kept under key and lock. Patients will be identified by a serial number, and personal information will not be released without their written consent. The Ministry of Health, the University of Zambia Research Ethics Committee and the School of Nursing sciences may review the records if need be, but this will be done with confidentiality.

## **7. Risks and discomforts**

There might be psychological distress or anxiety when recalling your treatment experience and adherence when answering certain questions from the questionnaire. If this occurs feel free to take break so that the anxiety might be relived. Other than that there will be no other risks involved in this research study , just part of your time will be utilized to answer some questions. If you will need further discussion, it will be offered to help you understand the topic more.

## **8. Benefits**

There is no direct benefit to you participating in this study, but the information which you will provide will help the policy makers to take measures that will benefit you in future to prevent radiation therapy treatment complications. No money will be given to you in exchange for information you will provide, but information and education will be given to you on the benefits of adherence to radiation therapy.

## **9. Compensation/reimbursement**

Patients in this study will have no provision for compensation as they will participate at free will as voluntary participation will be part of the enrollment criteria. The patients will also be interviewed on scheduled clinic days hence the study will not add any additional costs on them.

## **10. Consequences of inquiry**

The study will be a non-invasive and will not cause any physical harm or jeopardize the patients' lives. The patients will be explained to and a consent form obtained to prepare them psychologically for them to participate in the study.

### **Contact Details of Principal Investigator**

#### **Persons to contact for problems or questions**

Etambuyu Akufuna,  
The University of Zambia,  
School of Nursing sciences,  
P.O. Box 50110,  
Lusaka.  
Cell: 0974668592.  
Email address: [mercyakufuna@gmail.com](mailto:mercyakufuna@gmail.com)

### **Contact Details of Ethics Committee**

The chairperson,  
The University of Zambia,  
School of Medicine  
University of Zambia Biomedical Research Ethics Committee,  
Ridgway Campus  
P.O. Box 50110,  
Telephone: 260-1-256067  
Lusaka  
E-mail: [unzarec@zamtel.zm](mailto:unzarec@zamtel.zm)

**APPENDIX II: INFORMED VOLUNTARY CONSENT FORM**

I have read (been explained to) the purpose of this study. I understand the benefits, discomforts and confidentiality of the study. I further understand that, if I agree to take part in this study, I can withdraw at any time without having to give an explanation and that taking part in this study is purely voluntary.

I \_\_\_\_\_ (Names) agree to take part in this study.

Signed: \_\_\_\_\_ (Participant).

Date: \_\_\_\_\_

Participant’s signature or **thumb print**

\_\_\_\_\_

Signed: \_\_\_\_\_ (Researcher)

Date: \_\_\_\_\_

**APPENDIX III: DATA COLLECTION TOOL**

**The University of Zambia**

**School of Nursing Sciences**

**Semi-Structured Interview Schedule: Patients’**

**Adherence to Radiation Therapy Treatment among Cervical Cancer Patients at Cancer Diseases Hospital Lusaka, Zambia.**

**DATE OF INTERVIEW:** \_\_\_\_\_

**PLACE OF INTERVIEW:** \_\_\_\_\_

**NAME OF INTERVIEWER:** \_\_\_\_\_

**SERIAL NUMBER:** \_\_\_\_\_

**INSTRUCTIONS FOR THE INTERVIEWER**

1. Introduce yourself to the respondent.
2. Explain the reason for the interview.
3. Assure the respondent of confidentiality and anonymity
4. Do not write the name of the respondent on the interview schedule.
5. Fill in the most appropriate response to the question on the space provided.
6. Provide time for the respondent to ask questions at the end of the interview.
7. Refer the patients to a person who can answer the questions you are not sure of.
8. Thank the respondent at the end of each interview.

**SECTION A: DEMOGRAPHIC DATA**

1. How old are you?

2. What is your marital status?

1. single	2. married	3. Widowed	4. Divorced
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3. What is your level of education?

1. No formal education	2. Primary	3. Secondary	4. Tertiary
------------------------	------------	--------------	-------------

4. What is your church denomination?

1. Catholic	2. Seventh Day Adventist	3. Jehovah witness	4. Pentecostal churches	5. Others (Specify)
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**SECTION B: ECONOMIC FACTORS**

5. What is your occupation?

1. Civil Servant	2. Self-employed/Business	3. Retired	4. Unemployed	5. Other (specify)
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6. How much is your monthly family Income?

1. > k5000	2. K3000 - k5000	4. K1000 - k3000	5. k1000 - No income
------------	------------------	------------------	----------------------

7. Who pays for your radiation therapy services and other treatment costs?

1. Out of pocket	2. National health insurance	3. Private insurance	4. Faith Based NGO	5. Social welfare	6. Others specifies:
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8. What is the area of your residence?

1. Country	2. Province	3i. District	4. Type of residential area (Premium, Medium, Low, Village)

**SECTION C: PSYCHOLOGICAL DISTRESS USING THE MODIFIED SCREENING FOR DISTRESS SURVEY TOOL.**

9. Did you have any loss of intrest in life when reciving RT?

1. Yes	2. No
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10. Did you experience any lack of sleep or have difficulties in sleeping when receiving RT?

1. Yes	2. No
--------	-------

If yes to the above question, how many times did you experience that?

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11. Did you experience any suicidal thoughts during the time of receiving RT?

1. Yes	2. No
--------	-------

12. Did you experience any anxiety when receiving RT treatment?

1. Yes	2. No
--------	-------

13. Did you feel like you were depressed when receiving RT treatment?

1. Yes	2. No
--------	-------

14. How anxious were you feeling about receiving radiotherapy treatment?

1. Very anxious	2. Not anxious at all
-----------------	-----------------------

15. Did you experience any loss of interest in intimacy or sexuality when receiving RT?

1. Yes	2. No
--------	-------

16. Did you experience any frustration or anger when receiving RT?

1. Yes	2. No
--------	-------

17. Did the changes in appearance when receiving RT affect you in any way?

1. Yes	2. No
--------	-------

If yes to the above question, how did they affect you?

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18. Did you ever experience being sad when receiving RT?

1. Yes	2. No
--------	-------

**SECTION D: HEALTH CARE SYSTEM**

19. Did you ever miss your RT treatment due to the machines breaking down?

1. Yes	2. No
--------	-------

If the answer is to question 19 is yes, how many times did you miss your treatment?

--

20. Have you ever missed your treatment due to any other health related problems?

1. Yes	2. No
--------	-------

If yes to the above question specify.....,.....

--

21. Did you ever stop your treatment due to covid19 out break?

1. Yes	2. No
--------	-------

If yes to the above question, how many times did to abscond?

--

22. Did you ever miss your treatment due to missing blocks?

1. Yes	2. No
--------	-------

23. Did you ever miss your treatment due to your missing file?

1. Yes	2. No
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**SECTION E: ADHERENCE TO RADIATION THERAPY USING A MODIFIED BREIF ADHERENCE RATING SCALE.**

24. How many fractions of radiation therapy treatment were prescribed for you?

--

25. How many of the prescribed fractions of RT did you receive?

--

(If answers to question 19 and 20 are different), what was the reason for not receiving all the prescribed fractions?

--

26. For how long were you supposed to receive the prescribed fractions?

--

27. Were all the fractions received within the specified time?

1. Yes	2. No
--------	-------

(If the answer to question 27 is no), what was the time difference and reasons for not following the schedule?

--

28. Did you ever miss radiation therapy treatment due to personal reason?

1. Yes	2. No
--------	-------

(If yes to question 23), what was the reason of missing your RT treatment?

--

29. How many days were you away from your radiation therapy treatment?

--

30. Did you ever at any point in time during your RT treatment feel like stopping half way?

1. Yes	2. No
--------	-------

(If yes to question 25), what was the reason?

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**SECTION F: STAGE OF CERVICAL CANCER**

31. Where you told the stage of your disease at diagnosis?

1. Yes	2. No
--------	-------

(If yes to question 31), what was the stage of your disease?

--

(If No to question 26) interviewer to record the stage of the patient's disease according to the patients file?

--

32. Was there any treatment administered to you prior to receiving radiation therapy treatment?

1. Yes	2. No
--------	-------

(If yes to question 32), what treatment was administered to you?

**Check in the file if participant does not know the answers to question 31 and 32.**

33. If there was any treatment, was there any side affect you experienced?

1. Yes	2. No
--------	-------

If yes to question 28 what were the side effects you experienced?

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#### **SECTION H: SIDE EFFECTS OF RADIATION THERAPY**

34. Did you experience any side effects during receiving radiation therapy treatment?

1. Yes	2. No
--------	-------

(If yes to question 29), what were the side effects that you experienced?

--

Were the side effects the same as your prior knowledge before starting RT?

1. Yes	2. No
--------	-------

35. At what point did you start experiencing the side effects?

--

36. How severe were the side effects?

1. Mild i.e. vomiting, nausea, diarrhoea.
2. Moderate i.e. fatigue, skin problems, low blood cell counts..
3. Severe i.e. vaginal stenosis, premature menopause, radiation cystitis
4. Others specify.....

37. Did you ever think of stopping receiving RT due to the side affects you experienced?

1. Yes	2. No
--------	-------

If yes to question 37; were there other special reasons for that facilitated your thoughts to stop receiving RT?

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**We have reached the end, thank you very much for your participation.**

## **APPENDICES IV: TRANSLATED INFORMATION SHEET IN NYANJA**

### **UTENGA WAODWALA**

#### **1. Kuzimasulila**

Ndine Etambuyu Akufuna, nipunzila mapuzilo ya masters pasikulu yapunzilo apamwamba yamuzambia yomwe ikuza kusamalila odwala. Mozichepesa nipepa kutengako mbali kwanu muzamapuzilo ochulidwa pamwamba kukuza Kusatila jila yochilisila cancer yakuukazi. Kutengako mbali kwaimilila pakuzipeleka. Mukanga sanke kutengako mbali kapena kusatengako mbali. Ndinu omasuka kusiya kutengako mbali mukagamula tele ndipo zibani kuti kusiya sikuzalengesa kuti musiye kulandila chiliso muchipatala ichi. Ngati mulakalaka kutengako mbali muzapasidwa pepala polemba kuti mwabvomekesza. Chonde funsani pomwe simubvesesa kuti mumasulilidwe mujila yobveka

#### **2. Muthu wankani/mapunilo**

Kusatila jila yochilisila cancer yakuukazi pachipatala chamene chilangana pamatenda yacancer

#### **3. Lingo yankani/mapunzilo**

Mapunzilo aya yafuna kufufuza momwe anthu odwala cancer yakuukazi asatilila njila yochilisila cancer yakuukazi kuliodwala pachipatala chamene chilangana pamatenda yacancer. Mbili/nkani iza pezeka izatandiza bopanga malamulo ndiponso bosebezensa malamulo kumbali yazaumoyo zaziko kulimbisa njila zochilisa matenda yacancer yakuukazi muzambia.

#### **4. Motengela nkani/mapunzilo**

Nkani izatengedwa ndiofuna nkani kupitila mumafunso kompe pa kompe. Mukabvomekeza kufunsiidwa funa nkani bazafunsa mafunso ndikulemba mayanko yanu papepala ili namafunso. Mafunso yazafunsiidwa mupindi makumi yawili ndizisanu kapena pindi makumi yatatu.

#### **5. Kuzipeleka**

Kutengako mbali kwanu mulichito iyi kwaimilila kukuzipeleka kwanu. Simuza kakamizzidwa ngati simufuna. Mwasimikizilidwa kuti kusatengako mbali kwanu sikuzalengesa kuti museye kulandila chiliso muchipatala ichi. Mukangamula kutengako mbali ndimwe omasuka kusiya ntau iliyonse kopanda kupeleka chifukwa chosiyila. Mulinso ndiufulu osiya ntau iliyonse ngati mwafunsiidwa mafunso yomwe siyakubvesani bwino.

## **6. Kusebezesa ndi kusunga utenga**

Utenga ofufuza ndiutemga ulionse omwe ukuza nkani iyi/ mapunzilo aya uzankala obisidwa kulingana ndilamulo. Utenga uzasungidwa mumalo obisidwa ochingilizidwa ndifungulo. Chisulo chaziko yazambia chomwe chilangana pazaumoyo, chisulo chamapunzilo yapamwamba muzambia chomwe chikuza zofufuza ndi sikulu yaosamala odwala zinga bvumbuluse utenga ngati ufunidwa munjila yochingilizidwa.

## **7. Zoyofya ndi kusabva bwino**

Kungankale kusabva bwino pomwe muyesa kukumbuka zopyolamo zanu mukusatila chiliso ntau yomwe mufunsiwa mafunso. Zitachitika zotele ndinu omasuka kupuma kuti mutontozedwe. Kunja kwaizu kulibe zoyofya zina muzamapunzilo aya komabe mbali yantau yanu ndiye izasebezese. Ngati muzafuna kumasulilidwa zabili tandizo iliko yochitatele kuti mubvesese kani iyi

## **8. Ubwino/Pindu**

Kulibe pindu yomwe izabwela kuliimwe pompo mumapunzilo aya komabe utenga omwe muzapasa uzatandiza opanga malamulo yachiliso kupeza njila izakutandiza kuchingiliza zobvuta ndizofya zingatuluke mumakwala ndila zina zachiliso. Simuzalipilidwa pautenga omwe muzapasa koma muzapunzidwa ubwino osatila mofikapo kukuza njila yachiliso.

## **9. Malipilo**

Odwala mumapunzilo aya sazalipilidwa chifukwa kutengako mbali kwao mumuchitidwe uyu kuchokela kukuzipeleka kwao mozifunila ndiponso kusanka otengako mbali kuzaimilila pakuzipeleka. Odwala azafusindwa masiku yomwe amabwela kuchipatala mwaicho sikuzafunika ndlama zilizonse muzamapunzilo aya.

## **10. Zotuluka mukuku fufuza**

Mumapunzilo aya kulibe kuikidwa zilizose patupi kapena kupweteka odwala kungasokoneze umoyo wabo. Odwala azamasulilidwa ndikufunsa ngati babvomekesa ndikukozedwa mumanganizo mukutengako mbali muzamapunzilo aya.

**APPENDICES V: TRANSLATED VOLUNTARY PATIENT’S CONSENT FORM IN NYANJA**

Nabelenga ndiponso banimasulila lingo yamapunzilo aya. Nabvesesa pindu, zosabvesa bwino ndi chinsinsi chamapunzilo aya. Nabvesesaso kuti nikabvomela kutengako mbali ndine omasuka kusiya ntau iliyonse kupanda kumasula chifukwa ndiponso kuti katengako mbali kwaimilila pakuzipeleka.

Ine \_\_\_\_\_(Zina) nabvomela kutengako mbali mumapunzilo aya

Kusimikiza \_\_\_\_\_ (Otengako mbali)

Siku: \_\_\_\_\_

**Kusimikiza kapena chidido chao tengakombali**

\_\_\_\_\_  
Kusimikiza \_\_\_\_\_ (Ofufuza)

Siku \_\_\_\_\_

**APPENDICES VI: TRANLATED DATA COLLECTION TOOL**

**SIKULU YAMAPUNZILO YAPAMWAMBA YA ZAMBIA**

**SIKULU YOSAMALA ODWALA**

**NDONDOMEKO YAMAFUNSO: MOMWE ODWALA ASATILILA JILA  
YOCHILISILA CANCER YAKUUKAZI PACHIPATALA CHAMENE CHILANGANA  
PAMATENDA YACANCER**

**SIKU YAMAFUNSO** \_\_\_\_\_

**MALO YAMAFUNSO** \_\_\_\_\_

**ZINA YAOFUNSA** \_\_\_\_\_

**NAMBALA YAPEPA YAMAFUNSO** \_\_\_\_\_

**ZOSATILA KUOFUNSA MAFUNSO**

1. Kuzimasula kuli ofusidwa
2. Kumasulila lingo yamafunso
3. Kusimikiza chinsinsi kuofusidwa
4. Osalemba zina Yaofusidwa pandondomeko Yamafunso
5. Zazani yanko yoenelela pamalo yopasidwa
6. Pasani ntau kuofusidwa kufunsa mafunso mutasiliza kufunsa
7. Onesani odwala munthu wina agayanke mafunso yabo ngati mukaika
8. Yamikani ofusidwa mutasiliza mafunso

**CHIGAO CHA A: UTENGA WAMANKALIDWE**

1. Mulina zaka zingati?

2. Kodi mulimuchikwati?

1. Osakwatilidwa	2. Okwatilidwa	3. Ofedwa	4. Chikwati chinata
------------------	----------------	-----------	---------------------

3. Munafika pati mumapunzilo

1. osapunzila	2. ochepekela	3. yapakati	4. yapamwamba
---------------	---------------	-------------	---------------

4. Mupempela kuti?

1. Katolika	2. Sabata	3. Ba ntee ba yehova	4. Ma pente	5. Kinangu (nikuti)
-------------	-----------	----------------------	-------------	---------------------

**CHIGAO CHA B: ZOKUZA NDALAMA**

5. Nchito yanu ndiyotani

1. Nchito yaboma	2. nchito yozisebezela/wamalonda	3.opumuli sidwa	4. sinisebeza	5. zina zache (mungazikambile)
------------------	----------------------------------	-----------------	---------------	--------------------------------

6. Mumwezi mumapeza ndalama zingati?

i. > k5000	ii. K3000 - k5000	iii. K1000 - k3000	iv.k1000 – kulibe iliyonse
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7. Nindani amakulipililani ndalama zolandililapo chiliso ndizana zache zofunikila

1. ndlama zanga	2. ndlama zaziko zomwe zikuza tetezo yaumoyo	3. ndlama zomwe sizili zaziko zomwe zikuza tetezo yaumoyo	4.tubugwe twachikulupi lilo tomwe tuma pasa tandizo	5. tubugwe tomwe tulanga pazama nkalidwe yabantu	6. zina zache (mungazikambile)
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**8. Munkala kuti**

1. Ziko	2. Chigao chikulu	3. Chigao	4. musinku yamalo komwe munkala (yapamwamba, yapakati, yapansi, kumuzi)

**CHIGAO CHA C: KUBVUTISIDWA MUMAGANIZO KUSEBEZESA CHISULO  
CHOCHECHETELAKO ZOBVUTISA**

9. Kodi munafikapo pamunsinku osaona pindu yonkala ndiumoyo pomwe munali kulandila chiliso?

1. Ehe	2. Iyai
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10. Kodi munapyolako kusankala nditulo kapena kubvutika kunkala nditulo pomwe munalikulandila chiliso?

1. Ehe	2. Iyai
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Ngati nichocho, nikangati pomwe munapyola muzotele?

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11. Kodi munafikapo pamusinku onkala dimaganizo otesa umoyo wanu pomwe munalikulandila chiliso?

1. Ehe	2. Iyai
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12. Kodi munankalapo namantha pomwe munali kulandila chiliso?

1. Ehe	2. Iyai
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13. Kodi munazibva kuchepekela mphabvu ndichochita pomwe munali kulandila chiliso?

1. Ehe	2. Iyai
--------	---------

14. Chipimo chakuziba nkawa kapena mantha kwanu chinali motani pomwe munali kulandila chiliso?

1. Ndi nkawa kapena mantha maningi	2. Ninalibe nkawa kapena mantha
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15. Kodi munazibvako kusiya kuonesa chikondi ndiku kumana ndiokonedwa anu pomwe munali kulandila chiliso?

1. Ehe	2. Iyai
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16. Kodi munankalapo na mukwiyo kapena kukalipa pomwe munali kulandila chiliso?

1. Ehe	2. Iyai
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17. Kodi kuchinja kwamaonekedwe anu kunakukuzanikoni munjila iliyonse pomwe munalikulandila chiliso?

1. Ehe	2. Iyai
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Ngati nichocho, munakuzidwa munjila yotani?

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18. Kodi munazibvako kusankala okodwa pomwe munali kulandila chiliso?

1. Ehe	2. Iyai
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### **CHIGAO CHA D: ZUKUZA KUSAMALA UMOYO**

19. Kodi kuliko ntau yomwe simunalandile chiliso chifukwa zisulo zopasila chiliso sizinali kusebeza?

1. Ehe	2. Iyai
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Ngati nichocho, nikagati pomwe simunaladile?

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20. Kodi simunaladilepo chiliso chifukwa kunali zobvuta zaumoyo zina zache

1. Ehe	2. Iyai
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Ngati nichocho, zichuleni.

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21. Kodi munasiyapo kulandila chiliso chifukwa chamatenda yacovid19

1. Ehe	2. Iyai
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Ngati nichocho, nikangati?

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22. Kodi simunalandilepo chiliso chifukwa chosoba kumalo kopasila chiliso

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23. Kodi simunalandilepo chiliso chifukwa pepala molebedwa chiliso yanu yezeina soba

1. Ehe	2. Iyai
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**CHIGAO CHA E: CHIPIMO CHOSATILA CHILISO**

24. Nituduswa tungati twachiliso tomwe banakulebelani?

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25. Munaladila tuduswa tungati?

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Ngati tuduswa tomwemunalandila situlingana natwamene munalandila nichani chinalegesa

--

26. Tuduswa utu munalikufunnika kutulandila kwantau yotani

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27. Kodi tuduswa utu mutulandila muntau yoenelela

1. Ehe	2. Iyai
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Ngati sichocho, nichani chinalegesa kusatila mdodomeko?

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28. Kodi simunaladilepo chiliso chifukwa chazifukwa zanu?

1. Ehe	2. Iyai
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Ngati nichocho, nichani chinalegesa

29. Nimasiku yangati yomwe simunaladile chiliso

30. Kodi kuliko ntau yomwe munali kufuna kusiya chiliso musanafike kumapeto

cs1. Ehe

2. Iyai

Ngati nichocho, chifukwa?

### **CHIGAO CHA F: MISINKU YACANCER YAKUUKAZI**

31. Bushe mwezemunauzidwa munsiku wacancer yakuukazi yanu pomwe banakupezani ndimatenda

1. Ehe

2. Iyai

Ngati nichocho, inali pamunsiku uti

32. Kodi munaladilapo chiliso ina yache musanayambe chiliso yamatenda aya

1. Ehe

2. Iyai

Ngati nichocho, nichiliso yotani yomwe munalandila?

**Onanini mu faelo ngati oyanka siziba yanko palimafunso ya makumi yatatu naimozi ndi makumi yatatu naziwili.**

33. Ngati kunali chiliso inayache, kodi ina kupasa bvuto iliyonse?

1. Ehe

2. Iyai

Ngati chocho, nizobvuta zotani zomwe munapyolamo?

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**CHIGAO CHA H: ZOBVUTISA ZOMWE ZITULUKA MUNJILA YACHILISO**

34. Kodi munapyolako muzobvutisa kuchokela muchiliso yomwemunali kulandila

1. Ehe	2. Iyai
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Ngati chocho, nizobvuta zotani zomwe munapyolamo?

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Kodi zobvutisa zinali chimozi dizomwe munalikuziba musanayambe kuladila chiliso?

1. Ehe	2. Iyai
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35. Munayamba kupyola muzobvutisa pantau yotani?

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36. Chipimo chazobvuti chinali bwanji?

1. kuluka ndikutulula pang'ono
2 kuzibva kulema, mabvuto yankanda, kuchepekela kwatoduswa mumwazi
3. kuchepekela kwanjila yakuukazi, kusiya kupita kumwenzi musanga
4. Zina zache, mugazichule .....

37. Kodi munaganizapo kusiya kulandila chiliso chifukwa chazobvutisa munali kupyolamo?

1. Ehe	2. Iyai
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Ngati nichocho, kunaliko zifukwa zina zapadela zomwe zinalegesa kuti musangamusanga munkale ndimaganizo osiya kulandila chiliso?

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**Tafika kumapeto yamafunso, zikomo kwambili pakutengako mbali kwanu.**



**UNIVERSITY OF ZAMBIA**  
**BIOMEDICAL RESEARCH ETHICS COMMITTEE**

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20<sup>th</sup> November, 2020.

Your **REF. No. 1232-2020**.

Mrs. Etambuyu Akufuna,  
University of Zambia,  
Department of Nursing,  
P.O Box 50110,  
**Lusaka.**

Dear Mrs. Akufuna,

**RE: “ADHERENCE TO RADIATION THERAPY TREATMENT AMONG CERVICAL  
CANCER PATIENTS AT CANCER DISEASES HOSPITAL LUSAKA, ZAMBIA”  
(REF. NO. 1232-2020)**

The above-mentioned research proposal was presented to the Biomedical Research Ethics Committee meeting on 19<sup>th</sup> November, 2020. The proposal is **approved**. The approval is based on the following documents that were submitted for review:

- a) **Study proposal**
- b) **Questionnaires**
- c) **Participant Consent Form**

**APPROVAL NUMBER**

**: REF. 1232-2020**

**This number should be used on all correspondence, consent forms and documents as appropriate.**

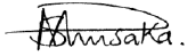
- **APPROVAL DATE** : 20<sup>th</sup> November 2020
- **TYPE OF APPROVAL** : Standard
- **EXPIRATION DATE OF APPROVAL** : 19<sup>th</sup> November 2021

After this date, this project may only continue upon renewal. For purposes of renewal, a progress report on a standard form obtainable from the UNZABREC Offices should be submitted one month before the expiration date for continuing review.

- **SERIOUS ADVERSE EVENT REPORTING:** All SAEs and any other serious challenges/problems having to do with participant welfare, participant safety and study integrity must be reported to UNZABREC within 3 working days using standard forms obtainable from UNZABREC.
- **MODIFICATIONS:** Prior UNZABREC approval using standard forms obtainable from the UNZABREC Offices is required before implementing any changes in the Protocol (including changes in the consent documents).

- **TERMINATION OF STUDY:** On termination of a study, a report must be submitted to the UNZABREC using standard forms obtainable from the UNZABREC Offices.
- **NHRA:** You are advised to obtain final study clearance and approval to conduct research in Zambia from the National Health Research Authority (NHRA) before commencing the research project.
- **QUESTIONS:** Please contact the UNZABREC on Telephone No.256067 or by e-mail on [unzarec@unza.zm](mailto:unzarec@unza.zm).
- **OTHER:** Please be reminded to send in copies of your research findings/results for our records. You're also required to submit electronic copies of your publications in peer-reviewed journals that may Emanate from this study. Use the online portal: [unza.rhinno.net](http://unza.rhinno.net) for further submissions.

Yours sincerely,



Sody Mweetwa Munsaka, BSc., MSc., PhD

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