ATTITUDES AND PRACTICES CONTRIBUTING TO VAGINAL STENOSIS AMONG CERVICAL CANCER SURVIVORS RECEIVING BRACHYTHERAPY AT CDH IN LUSAKA, ZAMBIA

BY

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A dissertation submitted in partial fulfillment for the award of the Degree of Master of Midwifery to the University of Zambia.

THE UNIVERSITY OF ZAMBIA

LUSAKA

OCTOBER 2022

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DECLARATION

I Royda Chibale Matipa, declare that this dissertation is my own work and that all the sources I have quoted have been indicated and acknowledged using complete references. I further declare that this dissertation has not been previously submitted for a diploma, a degree or for any other qualifications at this or any other university. It has been written according to the guidelines for Master of Science in Midwifery, Women and Child Health of the University of Zambia.

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CERTIFICATE OF COMPLETION OF DISSERTATION

I, Dr Catherine M Ngoma, having supervised and read through this Dissertation, am satisfied that this is the original work of the author under whose name it is presented. I also confirm that the work has been completed satisfactorily and approve this Dissertation for final submission

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CERTIFICATE OF APPROVAL

The University of Zambia approves this Dissertation by Royda Chibale Matipa on "Attitudes and practices contributing to vaginal stenosis in women with cervical cancer following brachytherapy" in partial fulfilment for the requirements for the award of a Master of Science in Midwifery, Women and Child Health Degree.

Examiner I

Name: _____ Signature: _____ Date: _____

Examiner II

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Examiner III

Name: _____ Signature: _____ Date: _____

ABSTRACT

Background: Radiation therapy, the leading cervical cancer treatment procedure to the pelvic region has a high likelihood to cause vaginal stenosis. Poor attitudes and practices towards preventive measures contributes largely to the development of vaginal stenosis in women receiving brachytherapy. This study aimed at determining attitudes and practices that contribute to vaginal stenosis among cervical cancer survivors receiving brachytherapy at Cancer Diseases Hospital in Lusaka (CDH) in Lusaka, Zambia.

Methods: A descriptive cross-sectional study design was employed which used a researcher administered questionnaire. Systematic sampling was used to sample 163 participants who met the inclusion criteria of being on brachytherapy at the time of the study or for 12 months prior to the study. Data was analyzed using SPSS version 25 utilizing chi square statistic to test associations. The relationships were considered significant only when the P-value was less than 0.05 margin of error at 95% confidence interval. Ethical clearance to conduct the study was obtained from UNZABREC (REF. 1770-2021) and National Health Research Authority.

Results: The study established a 42.3% prevalence of vaginal stenosis among the study population at Cancer Diseases Hospital (CDH) with the overall practice level in this study showed that the (76%) of the respondents reported good practices. They used preventive measures such as having regular penetrative sex, used of vaginal dilators and were using preventing measures regularly.While the overall attitude level among the study population showed that the majority (93.9%) of the respondents exhibited negative attitude towards vaginal dilators and would skip therapy because of discomfort and guiltiness. Religion and tradition contributed highly to poor attitudes towards preventive measures. Vaginal stenosis was slightly more common among Pentecostals (55.6%) and Adventists (52.9%) compared to Catholics (26.7%) and other religious groups (35.9%) (p=0.019). The study found that religion was independently associated with vaginal stenosis (OR=3.52, CI=1.27 – 9.51, P=0.015: OR=3.92, CI=1.49 – 10.3, P=0.005).

Conclusion: Radiation-induced VS was a commonly observed side effect following treatment with pelvic RT for cervical cancer patient. With the magnitude of radiotherapy-induced vaginal stenosis (RTIVS) emerging at 42.3%, efforts should be channelled towards overcoming religious, traditional, cultural and personal impediments contributing to vaginal stenosis in women with cervical cancer receiving brachytherapy.

Keywords: *Attitude, Practices, Cervical cancer, radiation therapy, brachytherapy, vaginal stenosis*

DEDICATION

This work is dedicated to my family, who have tirelessly supported me throughout this program and all my endeavors.

ACKNOWLEDGEMENT

Firstly, I would like to thank God Almighty for all his blessings and guidance in my life. I have reached this far only by his grace. I wish to express my special thanks to my supervisors DR. C. NGOMA and MS. S. MAYIMBO, for being very patient with me, for encouraging me and correcting my work. I also thank all the lecturers in the department of midwifery, women and child health for imparting knowledge in me during the course of the program.

I would like to thank my family for being supportive and encouraging me when I felt I could not go on. Thank you for being my motivation and strong support system.

Further, I would like to thank the respondents who participated in this study. Without them this study would not have been possible.

Lastly, I would like to acknowledge that this dissertation would not have been possible without a research grant from CHRESO University to whom I am very grateful.

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LIST OF ABBREVIATIONS

BT	Brachytherapy
CDH	Cancer Disease Hospital
CTCAE	Common Terminology Criteria for Adverse Events
EBRT	External Beam Radiation Therapy
HBM	Health Belief Model
IAEA	International Atomic Energy Agency
MRI	Magnetic Resonance Imaging
NHRA	National Health Research Authority
NCD	Non-Communicable Diseases
RTIVS	Radiotherapy-Induced Vaginal Stenosis
RT	Radiation Therapy
SPSS	Statistical Package for the Social Sciences
UNZA	University of Zambia
UNZABREC	University of Zambia Biomedical Research Ethics Committee
UTH	University Teaching Hospital
VD	Vaginal Dilator
VS	Vaginal Stenosis
WHO	World Health Organization

CHAPTER 1: INTRODUCTION

1.1 Background

Cervical cancer has consistently been among the top four most common cancers in women worldwide, and the second commonest of the cancers affecting women especially in regions with a low human development index where it is associated with 7.5% of cancer deaths (Bray et al., 2018). In Zambia, it is the leading cause of morbidity and mortality among all the cancers seen in the country (Pry et al.2021). Treatment of cervical cancers commonly involves pelvic radiation therapy (RT) called brachytherapy Yoshida, 2015). It consists of placing sealed, radioactive sources directly into or next to the tumor to be treated, either directly or by means of catheters (Dzaka and Maree (2016).

A commonly observed side effect of pelvic radiotherapy is radiation-induced vaginal stenosis (VS), defined as abnormal tightening and shortening of the vagina due to the formation of fibrosis (Yoshida, 2015). Vaginal stenosis may occur following external beam radiation therapy (EBRT) or brachytherapy or both delivered in the definitive, adjuvant or palliative setting. According to Mirabeau et al. (2015), it is well recognized that brachytherapy -induced vaginal stenosis may have negative impacts on patient well-being, in particular sexual dysfunction and dyspareunia and implications for limiting physical examination in the posttreatment period. Kirchheiner et al. (2016) further stresses that it can result in long-term vaginal changes, such as decreased lubrication and vaginal stenosis, characterized by vaginal canal obstruction due to scar tissue formation. Overall, vaginal stenosis can impact negatively on the quality of life and represent a long-term source of psychological and physical distress. Radiotherapy -induced vaginal stenosis may prevent adequate physical internal examination in the post-treatment follow-up period in order to detect disease recurrence (Yoshida, 2015).

Multiple risk factors for the development of brachytherapy -induced vaginal stenosis have been identified in the literature (Yoshida, 2015) and reported risk factors include patient age, radiotherapy dose and volume of vagina treated, combination of EBRT and brachytherapy and tumour extension to the vagina. In terms of patient factors, age >50 years has been associated with an increased risk of Vaginal stenosis in patients treated with pelvic and/or vaginal radiotherapy for cervix cancer (Mirabeau et al. (2015).

Prevention of vaginal stenosis involves the use of penile prothesis called vaginal dilators, penetrative sex and regular reviews. (Maira et al. 2016). Consistent use of these measures can reduce chances of developing stenosis and minimize the extent in cases where it develops.

According to Lubotzky et al. (2016), the use of vaginal dilators is recommended to prevent adhesions progression to fibrosis and stenosis of the vagina, especially during the first year after completion of radiotherapy in order to maintain vaginal patency (UK guidelines). If the adhesions are not broken down on a regular basis, contractions, shortening, narrowing and for some women complete obliteration of the vagina may develop. Compliance with dilator use has been associated with increasing vaginal comfort and control of pelvic floor muscles, and preserving overall vaginal health and sexual function. Dilator use compliance also enables adequate pelvic examinations to monitor for any recurring changes in vaginal tissue, an important element of cancer surveillance. Many women accept the established care, others accept care with restrictions or embarrassment but all understand the importance of vaginal dilatational exercises to prevent vaginal stenosis (Maira et al. 2016).

Regardless of the reported benefits of vaginal dilation therapy, the low level of compliance of women has remained a problem (Lee, 2018). Lee (2018) further states that studies have shown that women experience undesirable emotions while using the dilator, including embarrassment, anxiety, and fear; they also anticipate pain, loss of modesty, and experience a recollection of bad memories ranging from painful cancer treatments to sexual violence. This affects their attitude towards therapy, the workers and use of vaginal dilation and frequent sexual penetration to prevent vaginal stenosis. The exploration on the experiences of gynaecological cancer patients undergoing brachytherapy was found to be of a difficult nature (Humphrey et al., 2018). It was also found that poor attitudes towards therapy cancer patients such as fear, sexual inactivity, guilty from breaking religious and traditional, experience anxiety when going to the radiotherapy department because of a lack of knowledge of, and/or misconceptions about the treatment (Humphrey et al., 2018) contributed to vaginal stenosis. Humphrey et al (2018) also alludes that it is acknowledged that being informed does not alleviate all of the patients' fears, but rather contributes to the preparation of patients on what to expect and how to cope when undergoing a radiation related treatment procedure, for instance brachytherapy (Humphrey et al., 2018).

According to Humphrey et al. (2018), many Zambians attest to belong to the Christian faith. In most cases churches are accused of rejecting modern medicine due to moral and biblical beliefs. Religious practices may influence the practices and attitudes such as managing vaginal stenosis after brachytherapy. Participants' belief in God brought comfort and hope, as supported by 'It's only faith that gets us through this; participants trusted God to provide them with strength to tolerate the (Humphrey et al., 2018). The International Atomic Energy

Agency (2019) publication revealed that there were myths around cervical cancer treatment and outcomes to the extent that many resort to vising traditional healers and the use of herbs. Radiation-induced vaginal stenosis is a commonly observed side effect following treatment with pelvic radiotherapy pelvic cancers. There should be care to prioritize and recognize the potential negative impact of vaginal stenosis on the physical and psychological well-being of patients. This study therefore aimed at determining attitudes and practices that contribute to poor adherence to preventive measures against vaginal stenosis in women with cervical cancer following brachytherapy at the Cancer Diseases Hospital (CDH) in Lusaka, Zambia.

1.2 Statement of the Problem

The number of women presenting with vaginal stenosis (VS) following brachytherapy keeps increasing as recorded at CDH. It is documented that up to 88 percent of women treated for gynaecological cancers and cervical cancer particularly with brachytherapy will go on to develop vaginal stenosis, (CDH, 2019) which can result in long-term sexual dysfunction and painful vaginal examinations. Furthermore, the incidence of vaginal stenosis is variably reported in the literature, while preventative strategies and compliance are infrequently described and rarely evaluated (ACS, 2018). While many women accept the established care, others accept care with restrictions or embarrassment but all understand the importance of vaginal dilatational exercises to prevent vaginal stenosis (Maira et al. 2016). However, poor attitudes resulting from failure to adhere and practice preventive measures contribute to vaginal stenosis. There are a lot of myths around the causes, treatment and prevention of vaginal stenosis. Practices like seeking prayers and abandoning medical advice and the use of herbs/traditional doctors may exacerbate vaginal stenosis (Humphrey et al. 2018, The IAE, 2019).

Table 1.1: Case distribution at CDH (Source, CDH 2019 statistics)

YEAR	PATIENTS RECEIVING BRACHYTHERAPY	FOLLOW UPS	PERCENTAGE DEVELOPED VAGINAL STENOSIS
2017	508	1602	406(80%)
2018	564	1609	496(80%)
2019	431	1157	379(88%)
2020	508	1330	355(70%)

In 2017, the Cancer Diseases Hospital (CDH) in Lusaka Zambia, a total number of 1,602 patients were treated with brachytherapy. Of these 508 were first applications and 1,094 were follow-up applications (Source, CDH 2019 statistics). It is reported that 88% of these cases developed vaginal stenosis, which makes it worth investigating to establish attitudes and practices contributing to Vaginal Stenosis in women with cervical cancer following brachytherapy because of paucity of data on how many of these patients presented with vaginal stenosis on follow up and what specific attitudes and practices were associated with the prevalence.

1.3 Justification of the Study

Despite the education and counselling given to patients undergoing brachytherapy at the CDH, there is still an increased number of vaginal stenosis cases being recorded at the hospital.

A search in literature on attitudes and practices contributing to vaginal stenosis in cervical cancer following brachytherapy reveals that few studies have been done and published on the subject. Therefore, investigating the attitudes and practices contributing to vaginal stenosis following brachytherapy will aid caregivers adjust treatment guidelines and practices of care. This in turn may help reduce the prevalence of vaginal stenosis in cervical cancer women undergoing brachytherapy.

The research will also add to the canon of knowledge on the subject of factors contributing to vaginal stenosis following brachytherapy at CDH in Lusaka, Zambia and provide a stepping stone for future research on the subject matter. Further, Information obtained also provides evidence-based practice that will help improve post brachytherapy care to cervical cancer survivors at CDH and Zambia as a whole.

1.4 Research Question

What are the attitudes and practices contributing to vaginal stenosis in women with cervical cancer following brachytherapy at the CDH in Lusaka, Zambia?

1.5 Main Objective

1.To establish the attitudes and practices contributing to stenosis among cervical cancer survivors receiving brachytherapy at CDH.

1.6 Specific Objectives

2. To determine the prevalence of vaginal stenosis among cervical cancer survivors receiving brachytherapy at CDH.
3. To assess the attitudes of women contributing to vaginal stenosis among cervical cancer survivors receiving brachytherapy at CDH.
4. To examine the practices of women contributing to vaginal stenosis among cervical cancer survivors receiving brachytherapy at CDH.

1.7 Theoretical framework: The Health Belief Model

In order to establish attitudes and practices contributing to vaginal stenosis in women with cervical cancer following brachytherapy at the cancer disease hospital in Lusaka, Zambia, it is essential to use models that identify the factors affecting behaviour. The Health Belief Model (HBM) stands out to explain the patterns of behaviour that may be associated with development of vaginal stenosis and therefore will be used part of the theoretical framework. The health belief model (HBM) is a social psychological health behavior change model developed to explain and predict health-related behaviours, particularly in regard to the uptake of health services (Carpenter, 2010).

According to HBM, people change their behavior when they understand that the disease is serious; otherwise, they might not turn to healthy behaviours (Turner, 2004). The structures of the HBM model include perceived severity, perceived susceptibility, perceived benefits, perceived barriers, modifying variables, cues to action, and self-efficacy. The HBM suggests that people's beliefs about health problems, perceived benefits of action and barriers to action, and self-efficacy explain engagement (or lack of engagement) in health-promoting behavior. A stimulus, or cue to action, must also be present in order to trigger the health-promoting behavior. According to Siddiqui (2016), in this study, the HBM was applied by focusing on the attitudes, beliefs, and practices of individuals. Women receiving brachytherapy will take a health-related action such as use of vaginal dilators herbal medicines and other complimentary application if they felt that a negative related condition or side effects can be avoided, or has a positive expectation of taking a recommended action, or perceives that the benefits of partaking in a new behaviour or new action will reduce the chances of developing a medical condition or illness and its related symptoms (Siddiqui, 2016).

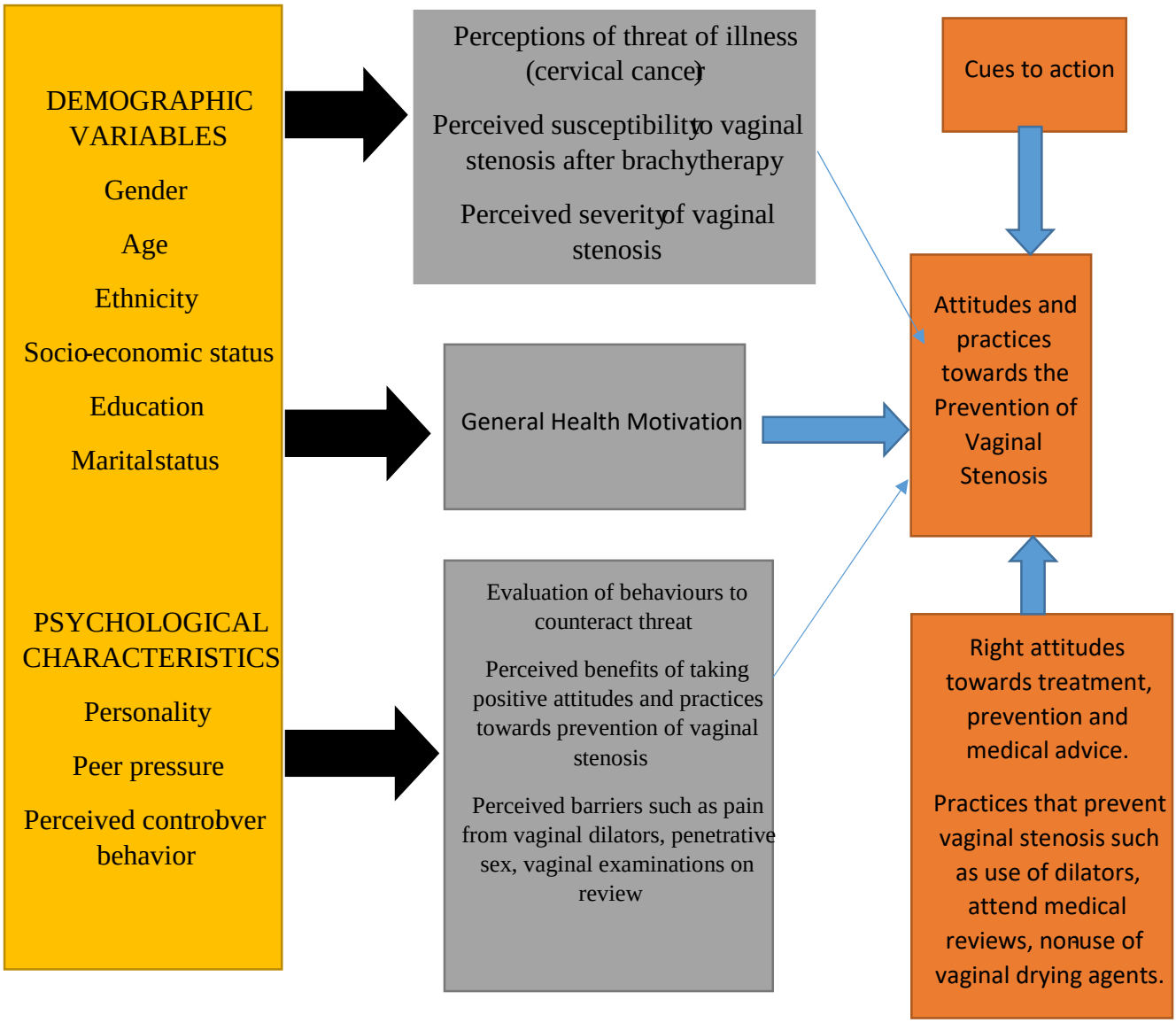

Figure 1.1: Diagrammatic presentation of the HBM *(Janz and Becker 1984)*.

1.7.1 Application of the model to the study

The HBM was suitably used to understand practices, beliefs and attitudes that contribute to vaginal stenosis in cervical cancer patients following brachytherapy. The layout of the theory and the six constructs as proposed show how decision by the patients to take up therapy, medical reviews, attitudes and beliefs cab understood perceived threats, motivation to live and perceived barriers.

Through the framework of the HBM, if women receiving brachytherapy for cervical cancer perceived that they were at risk of developing vaginal stenosis, and that it could become severe, they considered the benefits of engaging in healthcare seeking behaviour i.e., vaginal stenosis preventive measures and the possible barriers that may deter their action i.e., negative attitudes and poor practices, they then engage in the health behaviour with the self-confidence and the self-actualisation that the decision was the best to improve health.

1.8 Conceptual definitions of key terms

Attitude: A feeling or opinion about something or someone, or a way of behaving. In this study it will be used to refer to a set of emotions or feeling about brachytherapy or health care staff administering brachytherapy (Cambridge English Dictionary. Accessed October, 2020).

Belief: Is a state or habit of mind in which trust or confidence is placed in some person or thing. It is also a mental attitude of acceptance or assent toward a proposition without the full intellectual knowledge required to guarantee its truth (Yoshida, 2015).

Cervical cancer: Is a malignant cancer arising from the cervix and is due to the abnormal growth of cells that have the ability to invade or spread to other parts of the body (WHO, 2018).

Vaginal stenosis: Vaginal stenosis is the narrowing and/or loss of flexibility of the vagina, and it occurs as a side effect of radiotherapy and/or genital surgery. In most cases, it's also accompanied by the dryness and loss of resilience of scar tissue (Yoshida, 2015).

Brachytherapy: Brachytherapy is a type of radiation therapy used to treat cancer. It places radioactive sources inside the patient to kill cancer cells and shrink tumors (Dzaka and Maree, 2016).

External-Beam Radiotherapy (EBRT): Radiotherapy for cervical cancer usually involves a combination of external beam radiotherapy (EBRT) and brachytherapy using intracavitary radiotherapy (Yoshida, 2015).

1.9 Operational definitions of key terms

Attitude: refers to a set of emotions or feeling about brachytherapy or health care staff administering brachytherapy which may affect how they take care of themselves leading to vaginal stenosis.

Practice: In this study, the practice refers to the way that the respondents used to prevent vaginal stenosis with regards to the use of vaginal dilators.

Belief: In this study beliefs were used to express attachment and confidence to religion and traditional ways of treatment above medical advice.

Cervical cancer: In this study cervical cancer will be referred to as that which at the stage of being treated with brachytherapy

Vaginal stenosis: In this study, vaginal stenosis will be referred to as narrowing of the vaginal lining in patients with cervical cancer being treated with brachytherapy with symptoms related to treatment with brachytherapy.

Brachytherapy: In this study defined as treatment of cervical cancer using internal radiation in patients with cervical cancer.

1.10 Study variables

Dependent Variable: The Dependent variable for this study was vaginal stenosis following brachytherapy.

Independent Variables: The independent variables included attitudes and practices of women.

Table 1.2: Variables, indicators and cut-off points

Variables	Indicators	Cut – Off Points	Question No.
Dependent Variable			
Vaginal stenosis	Present	A scores of 4-1 if vaginal stenosis is present	27
	Absent	A Zero score if vaginal stenosis is not present	
Independent Variables			
Practices following brachytherapy	Good	A scores of 100-50 on Practice questions	20 – 26
	Poor	A scores of 49 and below on Practice questions	
Attitudes toward brachytherapy	Positive	A scores of 11-6 on attitude questions	11 – 19
	Negative	A scores of 5 and below on attitude questions	

CHAPTER 2: LITERATURE REVIEW

2.0 Introduction

This Chapter reviewed literature on vaginal stenosis following brachytherapy. The literature is arranged based on the objectives and follows a pattern of Global, Regional and Zambian based data on the Practices and attitudes contributing to vaginal stenosis in women with cervical cancer following brachytherapy at the University Teaching Hospital (UTH) in Lusaka Zambia. This chapter presents related materials reviewed from books, abstracts and articles from electronic databases i.e., Google scholar, PubMed, and Medline using key words such as vaginal stenosis, attitudes, practices and vaginal dilators.

2.1 Overview of Cervical cancer and vaginal stenosis

Cervical cancer is the fourth most frequent cancer in women with an estimated 570,000 new cases in 2018 representing 6.6% of all female cancers with approximately 90% of deaths from cervical cancer occurred in low- and middle-income countries (Bray et al., 2018). 311 000 deaths from the disease occurred in 2018 making cervical cancer was the fourth most common cancer in women, ranking after breast cancer (2.1 million cases). The estimated agestandardised incidence of cervical cancer was 13·1 per 100 000 women globally and varied widely among countries, with rates ranging from less than 2 to 75 per 100 000 women. Cervical cancer was the leading cause of cancer-related death in women in eastern, western, middle, and southern Africa. In Zambia, cervical cancer ranks as the most frequent cancer among women and the most frequent cancer among women between 15 and 44 years of age (Bray et al., 2018).

Despite interventions, a high percentage of women still develop vaginal stenosis after brachytherapy. The question therefore remains: what are the attitudes and practices which are contributing to development of vaginal stenosis in women with cervical cancer undergoing brachytherapy? Research have shown that preventive measures such as use of vaginal dilators, vaginal physiotherapy and sexual therapies have not reduced significantly on the prevalence of vaginal stenosis after brachytherapy. Suffice to mention there is very scanty data in literature particularly liked to attitudes and practices that contribute to vaginal stenosis. The gap may be sitting in the attitudes and practices by the patients which may be working against the prevention of vaginal stenosis. This study, being the first at CDH intends

to bring out attitudes and practices that contribute to vaginal stenosis after brachytherapy. This study may just form the baseline for future research.

Treatment of uterine, cervical, vaginal and other gynaecological cancers commonly involves pelvic radiation therapy (RT) (Yoshida, 2015). Brachytherapy is defined as the temporary or permanent application of small, sealed radioactive sources in close proximity to or within the target volume (Dieterich et al., 2015). According to Dzaka et al. (2016), brachytherapy is a specific form of radiation therapy used to treat cancer. It consists of placing sealed, radioactive sources directly into or next to the tumor to be treated, either directly or by means of catheters. The treatment dose distribution is characterized by localized high dose and a steep dose drop off. According to Vitale et al. (2016), the treatment of advanced cancer varies according to the degree of the disease staging and consists of the application of external irradiation to the pelvis and/or intra-cavitary and neo-adjuvant chemotherapy.

A commonly observed side effect of pelvic radiotherapy is radiation-induced vaginal stenosis (VS), defined as abnormal tightening and shortening of the vagina due to the formation of fibrosis (Yoshida, 2015). Vaginal stenosis may occur following external beam radiation therapy (EBRT) or brachytherapy or both delivered in the definitive, adjuvant or palliative setting. According to Mirabeau et al. (2015), it is well recognized that radiotherapy -induced vaginal stenosis may have negative impacts on patient well-being, in particular sexual dysfunction and dyspareunia and implications for limiting physical examination in the posttreatment period. Kirchheiner et al. (2016) further stresses that VS result in long-term vaginal changes, such as decreased lubrication and vaginal stenosis, characterized by vaginal canal obstruction due to scar tissue formation.

Overall, Vaginal stenosis can impact negatively on quality of life and represent a long-term source of psychological and physical distress. Radiotherapy -induced VS (RTIVS) may prevent adequate physical internal examination in the post-treatment follow-up period in order to detect disease recurrence (Yoshida, 2015). Further, radiation causes damage to the vaginal epithelium, connective tissue, and small blood vessels, causing inflammation and local cell death leading to decreased local blood flow, tissue hypoxia, loss of elastin, collagen deposition, and hyalinization. These processes cause weakening of the vaginal mucosa, loss of lubrication, and scarring and fibrosis making the vagina shorter, less elastic, and dry as well as affecting the patients' quality of life, especially regarding sexuality and self-esteem.

2.3 Prevalence of Radiotherapy-Induced Vaginal Stenosis

Globally the prevalence of vaginal stenosis has been invariably reported in the literature (Lee, 2018) ranging from 1.2% to 88%. Authors specifically addressing vaginal stenosis due to brachytherapy report an incidence ranging from 13-88% (Lee 2018 and Miles et al., 2014.). This is higher than the incidence derived from the reports where clinicians simply describe their experience (1.2%-54.7%). The reported prevalence of RT-induced VS is highly variable and may depend on patient, tumor and treatment factors. These factors include site of disease, RT modality, dose, dose fractionation schedule, concurrent chemotherapy and other patient factors including age and inherent radio sensitivity of tissues, and whether the side effect was specifically assessed (Mirabeau et al. 2015). Furthermore, it is noted that in the clinical setting, the discussion of vaginal stenosis and associated sexual dysfunction may be limited due to various issues including age, marital status and cultural factors. Therefore, incidence rates of VS and sexual dysfunction are likely to be underreported. A prospective study of 54 patients' reports that VS gradually increases with time, with grade 1 stenosis occurring within the first year of follow-up and the time to occurrence of moderateto-severe stenosis gradually increasing up to 3 years following treatment (Yoshida, 2015). The incidence seems to be highest in women undergoing definitive treatment for locally advanced cervical cancer (Kirchheiner et al., 2016). Recent data from the multi-centre international External beam radio chemotherapy and MRI based adaptive brachytherapy in locally advanced cervical cancer trial demonstrated that vaginal stenosis was the most frequently observed vaginal toxicity in women undergoing definitive chemo radiation and brachytherapy. In this study, 630 patients were prospectively assessed for VS every 3 months in the first year following treatment and every 6 months in the second and third year. Grade 2 VS was defined as vaginal shortening/narrowing interfering with function and grade 3 as complete vaginal obliteration not surgically correctable, according to the Common Terminology Criteria for Adverse Events (CTCAE 2017) Morris et al. (2017). Another study, whose objective was to evaluate the incidence of vaginal stenosis (VS) and identify clinical and treatment factors that predict for VS in female patients with anal cancer treated with definitive chemo-radiation concluded that vaginal stenosis was a common side effect for chemo-radiation (Morris et al 2017). The results showed that VS grade distribution was 21.4% grade 0, 14.3% grade 1, 27.1% grade 2, and 37.1% grade 3. By multivariable ordered logistic regression, younger age ($P = .02$), higher tumor dose ($P = .06$), and earlier treatment year ($P = .04$) were associated

with higher grade of VS. Younger age, higher tumor dose, and earlier year of treatment were associated with a higher grade of stenosis.

In another study by Son et al (2015) to determine Dosimetry Predictors of RadiationInduced Vaginal Stenosis after Pelvic Radiation Therapy for Rectal and Anal Cancer, it was revealed that vaginal stenosis (VS) was a recognized toxicity in women who receive pelvic radiation therapy (RT). In this study, 54 women, aged 29 to 78 years, who underwent pelvic RT for rectal or anal cancer during 2008 to 2011 and were enrolled in a prospective study evaluating vaginal dilator use. Maximum dilator size was measured before RT (baseline) and 1 month and 12 months after RT. Dilator use was initiated at 1 month. It was established that patients with compliance <40% were more likely to have toxicity and that vaginal stenosis was influenced by multiple RT dose-volume characteristics.in the same study, it was revealed that Mean dose and gEUD constraints together may reduce the risk of severe VS. Patients receiving higher mean vaginal doses should have greater compliance with dilator therapy to minimize risk of toxicity.

In Zambia and UTH in particular, information on prevalence of vaginal stenosis after brachytherapy is scanty and rarely recorded. A similar study on Observed and Expected Incidence of Cervical Cancer in Lusaka and the Southern and Western Provinces of Zambia by Kalima et al. (2015) showed that cervical cancer was significantly underestimated in Zambia. There appears to be little or no research on this specific subject in Zambia this far.

2.4 Attitudes contributing to brachytherapy-induced vaginal stenosis

Attitude towards therapy and certain practices may have an effect on the outcome of women developing vaginal stenosis and to what extent. According to Lee (2018), adherence to therapy instructions whether at follow up or use of therapy instruments like vaginal dilator is critical as the outcome of vaginal stenosis is concerned. Vaginal dilator (VD) therapy is often recommended for women receiving pelvic radiation therapy or experiencing pain and discomfort during intercourse, as well as for women with a congenital malformation of the vagina. Vaginal dilator use has both physical and psychological benefits; however, it often causes pain, discomfort, and adverse emotions, including embarrassment and loss of modesty, which often result in low adherence to therapy.

Lee (2018) in a study in South Korea, aimed at exploring the use and adherence of VD therapy in women, identify barriers and facilitators of therapy adherence, and suggest improvement strategies concluded that poor adherence and negative attitude towards therapy contributed to vaginal stenosis among cervical cancer patients undergoing radiation therapy.

Women's adherence to the therapy ranged between 25% and 89.2%, with great variance in definitions and methods for assessing therapy adherence. Among the five categories of identified barriers to therapy adherence, "unhelpful circumstances" and "negative perceptions toward the VD" were the two most frequently mentioned. The two most frequently reported facilitators of adherence among the six identified categories were "supportive interactions with health care providers" and "risk perception and positive outcome expectancies".

According to Lubotzky et al., (2016), the use of vaginal dilators is recommended to prevent adhesions progression to fibrosis and stenosis of the vagina, especially during the first year after completion of radiotherapy in order to maintain vaginal patency (UK guidelines). If the adhesions are not broken down on a regular basis, contractions, shortening, narrowing and for some women complete obliteration of the vagina may develop. Compliance with dilator use has been associated with increasing vaginal comfort and control of pelvic floor muscles, and preserving overall vaginal health and sexual function. Dilator use compliance also enables adequate pelvic examinations to monitor for any recurring changes in vaginal tissue, an important element of cancer surveillance.

In another study by Bakker at al., (2015) aimed at identifying determinants of patients' adherence to external beam radiation therapy and brachytherapy (ERBT/BT) to prevent vaginal stenosis concluded that it was important to provide sufficient patient information and support, and enlarge patients' perceived self-efficacy in order to deter attitudes, practices and beliefs that contribute to vaginal stenosis. According to Bakker et al., (2015), treatment with pelvic external beam radiotherapy (EBRT) with brachytherapy (BT) for gynaecological cancers may cause sexual dysfunction because of vaginal shortening and tightening. Regular vaginal dilator use is recommended to reduce vaginal shortening and/or tightening, but compliance is poor. Intended dilator use was determined by the expectation that it would prevent the development of vaginal adhesions and stenosis. Women reported a lack of time or privacy, forgetting, or feeling tired. Women self-regulated dilator use by rotating the dilator and timing dilator use. Influencing factors were negative emotions regarding dilator use or its hard plastic design, (being anxious for) pain or blood loss, and an association with EBRT/BT. Some women mentioned a lack of instrumental support, for example, lubricants, while as mitigation others received reassurance through informational support or were supported socially.

In another study by Dzaka at al. (2016) to present descriptive summaries of the experiences of women treated with high dose rate brachytherapy for cervical cancer was conducted in

Gauteng South Africa. Basically, the study was meant to evaluate causes of negative attitudes and practices that encouraged the development of vaginal stenosis in women who underwent brachytherapy after cervical cancer. It was discovered that being treated with brachytherapy was a negative experience causing fear, pain and humiliation and that participants feared the procedure, before receiving the first treatment and even after having had one. Pain was a major problem, as the preventative medication participants received did not protect them from experiencing pain. Having to open and hang their legs was a humiliating experience aggravated by the presence of observers and the rotation of doctors and therefore created negative attitudes towards the treatment. In addition to individualised patient education, nurses needed to assess the level of pain women experienced before, during and after receiving brachytherapy and advocate for the revision of pain management protocols. If not revised these created negative attitudes towards preventive methods against vaginal stenosis and also made women take optional that were unconventional.

In a study by Dzaka et al., (2016), participants experienced emotional distress before, during and after having brachytherapy. They feared the procedure even before having had it and the rest of the treatment after having had the first. This in return makes the women to have negative attitudes towards treatment and follow up. According to Dzaka et al., (2016), the act of opening legs in the presence of physicians and other health workers was uncomfortable and painful. Participants described the fear for the follow-up treatment, the thought of having to 'open' and 'hang' their legs demeaned participants and added to their emotional distress and created negative attitudes towards the treatment, the health workers, follow up and eventually the outcome of treatment. These are some of the experiences that from up the attitudes that contribute to the development of vaginal stenosis.

Not having the same doctor, and having observers present caused helplessness and added to participants' humiliation. This affects the outcome of treatment as patients may default or seek unconventional treatments such as traditional medicine and the outcome maybe vaginal stenosis. Most participants did not feel prepared for the treatment and felt nothing was explained to them during the procedure. In addition, some were of the opinion that the healthcare professionals did not display a caring attitude towards them. The attitudes in the above studies were fully measures as most studies focused on experiences and not attitudes towards therapy in relation to vaginal stenosis. This study was meant to close the gap by establishing attitudes contributing vaginal stenosis following brachytherapy in cervical cancer.

2.5 Practices contributing to brachytherapy-induced vaginal stenosis

Vaginal dilator (VD) therapy is often recommended for women receiving pelvic radiation therapy or experiencing pain and discomfort during intercourse, as well as for women with a congenital malformation of the vagina. VD use has both physical and psychological benefits; however, it often causes pain, discomfort, and adverse emotions, including embarrassment and loss of modesty, which often result in low adherence to therapy. A study by Lee (2018) aimed at exploring the use and adherence of VD therapy in women, identify barriers and facilitators of therapy adherence, and suggest improvement strategies from the theoretical perspective of symbolic interactionism showed that many women were not practicing the use of vaginal dilators correctly mostly because of pain and also negative perceptions. The barriers identified in the studies were grouped and analyzed according to the following five categories: 1) negative perceptions toward VD, 2) uncertainty about therapy, 3) unfavourable accompanying physical signs and symptoms, 4) less supportive interactions with health care providers, and 5) unhelpful circumstances.

In another study in India by Singh et al. (2017), whose objective was to investigate dose response relationship between vaginal doses and long-term morbidity, it was concluded that radiation therapy increased morbidity with vaginal stenosis. The probability of stenosis increased from 32% at 70 Gy3, 38% at 80 Gy3, and 45% at 90 Gy3 rectovaginal point dose. Another study in Eastern India to explore possible predictors of early vaginal stenosis among patients with locally advanced cervix cancer on pelvic chemo-radiation was conducted by Gangopadhyay and Biswas (2015). The results showed that initial vaginal involvement and addition of concomitant chemotherapy are predictors of early vaginal stenosis in locally advanced cervical cancer patients on pelvic chemo-radiation. Relative risk for early vaginal stenosis with vaginal involvement at presentation was 16·31, whereas that for concomitant chemotherapy was 9·95. It was concluded that among patients with locally advanced cervix cancer receiving pelvic chemo-radiation, two factors, namely, initial vaginal involvement and concomitant chemotherapy are predictive of early vaginal stenosis.

A study by Nyambe et al. (2019) to ascertain the relationship between knowledge about cervical cancer, attitudes, self-reported behavior, and immediate support system, towards screening and vaccination of cervical cancer of Zambian women and men revealed that low level of knowledge on causes and prevention of cervical cancer was related to low levels of uptake of screening and preventive measures against cervical cancer. The study also concluded that, factors such as religion and cultural beliefs were also identified to influence

health practices. A study in Nigeria found that barriers to cervical screening vary by religion (Masika et al., 2015). Additionally, a study on school teachers in Kenya found that some religious beliefs were against vaccinations (Masika et al., 2015). This has led to the assumption that religious beliefs limit the uptake of screening and vaccination. Therefore, the belief in religion and cultural beliefs can lead to poor adherence to practices that would prevent vaginal stenosis.

A study by Humphrey et al. (2018) in Zambia aimed at exploring the experiences of gynaecological cancer patients' undergoing brachytherapy was found to be of a difficult nature and that cancer patients were often fearful and experienced anxiety when going to the radiotherapy department because of a lack of knowledge of, and/or misconceptions about the treatment. It was acknowledged that being informed did not alleviate all of the patients' fears, but rather contributes to the preparation of patients on what to expect and how to cope when undergoing a radiation related treatment procedure, for instance brachytherapy (Humphrey et al., 2018). According to this study, many Zambians attest to belong to the Christian faith. In most cases churches are accused of rejecting modern medicine due to moral and biblical beliefs. Religious practices may influence the practices and attitudes such as managing vaginal stenosis after brachytherapy.

The pain participants experienced was so severe some could not help but cry out, as the preventative medication they received did not protect them. However, their belief in God comforted them and gave them courage to endure the treatment, whilst caring staff also comforted and supported those (Dzaka and Maree, 2016) “Participants’ belief in God brought comfort and hope, as supported by ‘It’s only faith that gets us through this’; participants trusted God to provide them with strength to tolerate the treatment’ (Humphrey et al., 2018). The IAEA (2019) publication revealed that there were myths around cervical cancer treatment and outcomes to the extent that many resort to using traditional healers and the use of herbs. Kindly divide this paragraph in two, it is too long.

2.6 Usage of vaginal dilators

Regular use of vaginal dilators has been recommended as a prophylactic measure following treatment for gynaecological cancers in order to break down adhesions, minimize vaginal stenosis, increase blood flow to the area, and promote optimal healing of the vagina (Fleming et al., 2016; Carter, et al., 2011). Vaginal dilation involves placing a smooth, cylindrically shaped device with a closed rounded tip into the vagina with firm and gentle pressure, moving it in a forward and backward motion, and rotating it in order to separate the walls of

the vagina and stretch the vaginal tissue (Miles and Johnson, 2014). Given that most of the damage due to radiotherapy occurs in the upper third of the vagina (Akbaba et al., 2019), women are encouraged to insert the dilator as deeply as comfortably possible. To help facilitate this, health care providers often advise women to find a private and comfortable space where they can relax and use the dilator; this can be achieved in the shower or bath, as well as lying down comfortably in a bed (Miles and Johnson, 2014). Women are typically offered a few dilators in various sizes according to their needs, gradually increasing the size of the dilator when they feel comfortable to do so (Miles and Johnson, 2014).

2.6.1 Recommendations for Rehabilitative Dilator Use

Recommendations regarding the frequency and duration of vaginal dilator use vary slightly depending on the literature, country, and even between local treatment centers. However, women are typically encouraged to start dilating within a few weeks of their final radiation treatment (Miles and Johnson, 2014). For example, best practice guidelines in the UK recommend that women use the vaginal dilators for five to ten minutes, a minimum of three times a week, for an indefinite period of time (Miles and Johnson, 2014). A survey of Australian practices (Lancaster, 2004) found that the recommended frequency of dilator uses and insertion time varied considerably. Of the 15 radiation oncology sites surveyed, the most commonly recommended frequency was two to three times a week, while recommended insertion time was ten minutes. Additionally, most sites recommended that women dilate for an indefinite period of time (Lancaster, 2004). Unfortunately, there is no existing literature examining dilator recommendations in Zambia; however, interventions designed by Zambian researchers to increase adherence with vaginal dilator use were based on the recommendation of dilating at least three times a week (Charatsi et al., 2022; Jeffries et al., 2006; Robinson et al., 1999).

Regular sexual intercourse is a potential alternative to using vaginal dilators but the opinion of whether vaginal dilators should be prescribed based on sexual activity is also quite variable. Delishaj et al. (2018), for example, recommend the routine use of vaginal dilators only for women who are not sexually active. Conversely, some health care providers prescribe vaginal dilators only to women who are sexually active, perhaps because they assume that keeping the vagina flexible and open is not necessary for women without a current sexual partner (Lancaster, 2004). Unfortunately, both of these practices have the potential to overlook women who would benefit from using the dilators.

2.6.2 Efficacy of Rehabilitative Vaginal Dilator Use

Extant literature suggests that there are conflicting opinions regarding the effectiveness of rehabilitative vaginal dilator use for maintaining vaginal depth and width following radiation treatment (Carter et al., 2011). In fact, two widely cited Cochrane reviews have even published opposing results. In a 2002 Cochrane review examining the evidence for treatment addressing the physical components of sexual dysfunction arising from radiation therapy, Denton and Maher (2003) evaluated studies defined as randomized control trials, randomized studies, quasi-randomized trials, cohort studies, and case controlled retrospective studies; of the 32 references that met inclusion criteria for the search, only four were suitable to be included for statistical analysis, two of which were specific to dilator use. Both studies demonstrated a significant benefit maintained for a follow-up period of one year, and the authors of the review concluded that enough evidence existed to support the recommendation of rehabilitative dilator use for preventing vaginal stenosis.

In a more recent Cochrane review, Miles and Johnson (2014) searched for comparative randomized control trials or studies of any type that compared dilation of the vagina after pelvic radiation for cancer. The electronic search found seven articles referencing vaginal dilation following radiotherapy, only four of which contained any comparative data. Of the potentially relevant articles, all were excluded from the study because they did not meet the authors' criteria for high quality comparative trials of dilation versus no dilation. Two randomized trials were excluded because they examined the effectiveness of interventions designed to increase adherence to vaginal dilator use. Other studies were excluded based on design or methodological issues; examples include case studies, the use of historical controls, and lack of control groups. Based on their exclusion of all relevant data, the authors concluded that there was no reliable evidence demonstrating that vaginal dilators prevent vaginal stenosis or have any beneficial impact on sexual functioning or vaginal anatomy (Johnson et al., 2010; Miles and Johnson, 2014).

A closer examination of the studies examined by both of these reviews suggests that there is some evidence to support the recommendation of rehabilitative vaginal dilator use. In a retrospective pilot study, Decruze et al. (1999) as cited by Akbaba et al. (2019) evaluated the effectiveness of a vaginal dilator they had designed to suit women's anatomy better than the existing dilators. The sample consisted of 70 women who had undergone radiation treatment for gynaecological cancer; half of the women were instructed to insert the dilator daily for a year, the other half were not given a dilator. At the one-year follow-up, 57% (20/35) of

women who were not given the dilator had vaginal stenosis, compared to 11% (4/35) of those who were provided with the dilator. Of the four women with vaginal stenosis who had been prescribed a dilator, one was too frightened to use it, one was confused, and two did not understand how to use it. Once these women received further instructions, the authors reported that stenosis improved, although no further details were given. Because this pilot study produced such compelling results, the authors felt it would be unethical to perform a randomized study.

The lack of reliable instruments for measuring vaginal length and width (Tramacere et al., 2022), as well as the variation in which vaginal stenosis is assessed (Lancaster, 2004) likely contribute to the lack of undisputable evidence supporting the effectiveness of rehabilitative vaginal dilator use. Notably, however, there are no existing studies demonstrating that vaginal dilators are not effective. Although the authors of a recent Cochrane review (Miles and Johnson, 2014) concluded that the existing literature does not provide strong enough evidence to endorse the recommendation of vaginal dilator use, a closer examination of these studies suggests that there may be stronger evidence in support of this practice rather than against it.

Despite the ongoing debate as to whether rehabilitative dilator use produces any physical changes in the vagina, Carter et al. (2011) suggests that the greatest benefit of using vaginal dilators may simply be to reduce the potential anxieties associated with having something inserted into the vagina, including being able to tolerate a speculum for vaginal exams. Moreover, using vaginal dilators may provide feedback to women as they learn to reduce the tension in the pelvic floor to allow for vaginal penetration via sexual intercourse or through a pelvic exam (Carter et al., 2011). Thus, the potential psychological and practical benefits to vaginal dilator use should be considered alongside any physiological benefits associated with it.

Regardless of the conflicting conclusions, rehabilitative vaginal dilator use continues to be a widely endorsed practice by health care providers and is regularly prescribed to women who have received radiation therapy for gynaecological cancer in various parts of the world (Akbaba et al., 2019; Charatsi et al., 2022; Miles and Johnson, 2014).

2.7 Conclusion

In conclusion, radiation-induced vaginal stenosis is a commonly observed side effect following treatment with pelvic radiotherapy pelvic cancers. Globally, the prevalence of vaginal stenosis maybe be as high as 88%, while studies in Zambia on prevalence are non-

existent in literature. There are a lot of factors that may increase the chances of developing vaginal stenosis. The attitude of patients towards treatment and follow up and the beliefs in religion may affect treatment outcome. The practices such as application unconventional herbs and other topical therapies to open up the vaginal canal after stenosis may just worsen the situation. There should be care to prioritize and recognize the potential negative impact of vaginal stenosis on the physical and psychological well-being of patients.

CHAPTER 3: METHODOLOGY

3.0 Introduction

The literature relating to the research topic was reviewed in Chapter 2 and the researcher introduced concepts that influenced the development of the structured questionnaire as a data collection instrument for the study. In this chapter the different phases of the research methodology were discussed in depth. Mouton (2001) points out that the research methodology concentrates on each step in the research process, including the development of the data gathering instrument(s) and actions to be taken. This consisted of a study area, study design, study population, sample size determination, sampling procedure, definition of variables, data collection procedure, data management, data, analysis, ethical considerations.

3.1 Study Design

The study design used was a descriptive cross-sectional design with quantitative dimensions. A descriptive design is a non-experimental research design to discover new meaning and to provide new knowledge since very little is known about the phenomenon of interest. It involves a systematic collection and presentation of data to give a clear picture of a particular situation (Cottrell and McKenzie, 2011). A cross-section survey is a study aimed at determining the frequency or level of a particular attribute, such as a specific exposure, disease or other healthrelated event, in a defined population at a particular point in time (Cottrell and McKenzie, 2011).

A descriptive cross-sectional design with quantitative dimensions was selected so as to collect numerical data to assess the attitudes and practices among cervical cancer survivors which contribute to the development of vaginal stenosis following brachytherapy at CDH. This enabled the researcher to describe the responses given by the participants.

3.2 Study setting

The study was conducted at the Cancer Diseases Hospital in Lusaka. It is a national cancer centre established in 2006. Located in the capital city of Lusaka, it is the only centre in the country offering radiotherapy and serves the entire population of Zambia as well as some neighbouring countries (Malawi, Democratic Republic of Congo and Zimbabwe). CDH offers comprehensive cancer care and is equipped with three teletherapy machines (one Linear Accelerator and two Cobalt machines), two brachytherapy suites (one with functioning 6channel and the other with 18-channel iridium-based high dose rate unit), two CT simulators (1 used more for diagnostic purposes), one MRI machine, Mammography,

ultrasound and a digital X-ray unit. It also has a self-contained chemotherapy suite, operating theatre and a 252 in-patient bed unit. There are 7 radiation oncologists, 5 medical physicists, 25 radiation therapy technicians and 189 nurses in different capacities (12 oncology nurses, 1 palliative care nurse, 2 operating theatre nurses, 5 diagnostic nurses, 147 registered nurses, 19 enrolled nurses and 13 in administrative positions). The facility has enrolled and provided care for an increasing number of patients since its inception, totaling just above 3,000 new patients in 2019 (CDHHIMS, 2019). Cervical cancer is the leading cancer with an incidence of 66.4 per 100 000, followed by prostate cancer (45.6 per 100 000) and breast cancer (19.9 per 100 000) (Globocan, 2019). This setting was chosen because it is the country's only cancer center, and was the best fit for the objectives of this current study.

3.3 Study Population

The population under study were women with cervical cancer and receiving brachytherapy at UTH/CDH.

3.3.1 Target population

Patients suffering from cervical cancer who were currently receiving brachytherapy or received brachytherapy in the past 12 months prior to the interview. The 12 months' post treatment follow up was included because it was assumed that participants were able to provide sufficient information about their attitudes and practices contributing to vaginal stenosis.

3.3.2 Accessible population

The accessible population in this study will be women from among the 1603 receiving brachytherapy who would be available for interviews at the time of data collection.

3.4 Sampling Techniques

Systematic sampling was used for participants receiving brachytherapy at CDH. From the patient size of 1602 and calculated sample size of 163, the sampling interval was 10 (1602/163 = 10). Therefore, every 10^{th} patient was selected from the patient list until the desired sample size of 163 was reached. Respondents who were twelve months post brachytherapy were randomly sampled from the hospital patients' record book.

3.4.1 Inclusion Criteria

For someone to be a suitable respondent to participate in this research, she must have been a patient suffering from cervical cancer and was currently receiving brachytherapy as a result of cervical cancer or had received brachytherapy in the past 12 months prior to the interview. The inclusion criteria did not consider the presence or absence of vaginal stenosis in the respondent.

3.4.2 Exclusion Criteria

Any sign of recurrent or metastatic cancer, medical or psycho-logical problems and all those with vaginal stenosis not linked to cervical cancer radiation therapy were excluded from the study.

3.5 Sample size

Sample size of 163 was calculated using the Gosh formula (Gosh, 2013) from a population of patients treated with brachytherapy in 2019=1,602 (CDH 2019 statistics).

$n= Z^2P(1-P)/d^2$ Where; p = 88% = 0.88,

prevalence of vaginal stenosis

Z = 1.96, the standard normal variate at 95% confidence level

d = ±5% = ±0.05, the precision (margin of error) $n= 1.96^2$

X 0. 88 X $(1-0.88)/0.05^2$

= 162.3 = 163

3.6 Data Collection Methods

3.6.1 Data Collection Instrument

Data was collected using a questionnaire. To ease application, the wide range of information covered in the questionnaires was arranged into the sections; demographics, presence of vaginal stenosis, brachytherapy as treatment received, attitudes and practices contributing to vaginal stenosis. The questions were predominantly closed ended to allow respondent to respond fully and appreciate their views and for easier analysis.

3.6.2 Validity and reliability

The researcher ensured that the research instrument was checked for validity by two subject matter experts. The content validity was ensured by taking suggestions from experts, advisers and lectures that looked at its relevancy, clarity and consistence to the study. However, there was no need to amend the questionnaire as no major changes were suggested after review.

Reliability was upheld by using the same instrument to collect data from the respondents and clarifications were done so that they did not misunderstand the questions. To achieve this, a test re-test analysis was employed during the pilot study.

The test-retest analysis gave no differences in findings; this proved the validity and reliability of the data collection instrument.

3.6.3 Pilot Study

The questionnaire was pre-tested to check if it was clear enough to potential participants. Sixteen (16) interviews were done to test the study instrument at CDH. CDH was used only despite being the study site because at the moment it is the only institution offering the services under study. From the pilot study, the researcher became content that the instrument will help collect data on attitudes and practices that contribute to vaginal stenosis in women who have received brachytherapy due to cervical cancer.

3.6.4 Data Collection Technique

A structured questionnaire was used to collect data for this study. Files for patients coming for review on each particular day were temporarily coded for use when sampling. To avoid problems with illiteracy and possible language barriers, the questionnaires were administered by the researcher. All respondents were given the information sheet about the study and signed a consent form. Participation was voluntary. The researcher anticipated to conduct a maximum of ten interviews per day in order to be effective and not to keep respondents waiting for long at the hospital after their medical reviews.

3.5 Ethical Consideration

The approval to conduct the study was obtained from UNZABREC (REF. 1770-2021) and National Health Research Authority (NHRA). Informed consent was sought from each study participant prior to enrolment. In the event that the respondent refuses to take part in the research, they were replaced and all respondents were treated as anonymous to avoid

identification. In situations where the respondent desired to withdraw and it was outside the control of the interviewer, they would have been freely allowed to do so and all their information shredded immediately, however, no patient withdrew from the study. Information that was obtained during the study was treated with utmost confidentiality as it borders on personal information which most people would rather keep to themselves. Written permission from study site was also be obtained.

CHAPTER 4: PRESENTATION OF FINDINGS

4.0 Introduction

This chapter presents quantitative research findings, data analysis and presentation of findings. The purpose of this study was to establish Attitudes and Practices Contributing to Vaginal Stenosis among Cervical Cancer Survivors Receiving Brachytherapy at Cancer Diseases Hospital in Lusaka, Zambia. Data were collected using a structured questionnaire where 163 respondents were interviewed, resulting in a 100 percent response rate.

4.1 Data Processing and Analysis

After data collection, the questionnaires were sorted, responses verified, coded and entered on excel data master sheet to allow for easier analysis. Data was later exported to SPSS version 25 for analysis. The median with associated interquartile range was used to summarise continuous variables, whereas, frequencies and proportions were used to summarise categorical variables. Chi-square and Fisher's exact test was used test association between the dependent variable and categorical independent variables. For continuous variables, the Wilcoxon rank sum test was used to test for a difference in medians. Univariate and multivariable logistic regression analysis was used to identify predictors of vaginal stenosis. Statistical significance was set at 5%, thus only p-value of or less than 0.05 indicated significance.

4.2 Presentation of Findings

The findings of this study are presented according to the sequence of questions and sections in the structured questionnaire, using frequency tables, charts and contingency tables. This is to provide a summary of results and facilitate understanding of the study findings. Tables and graphs summarized findings in a meaningful manner for easy understanding, while contingency tables were helpful in showing relationships between variables. The findings of this study are presented under sections; demographic characteristics, knowledge levels, attitudes, practices, association between variables and logistic regression analysis.

4.2.1 Socio-Demographic Characteristics

The sociodemographic characteristics of women enrolled in the study are presented in table 4.1 below.

Table 4.1: Socio-demographic characteristics of respondents (n=163)

Variable	Category	Frequency (n)	Percent (%)
Age	15 – 25 years	8	4.90
	26 – 39 years	42	25.8
	40 – 49 years	57	35.0
	At least 50 years	56	34.4
Marital status	Single	93	57.1
	Married	70	42.9
Hometown	Lusaka	70	42.9
	Outside Lusaka	93	57.1
Distance from CDH	Under 5km	50	30.7
	5 – 10km	17	10.4
	Over 10km	96	58.9
Religious affiliation	Catholic	45	27.6
	Adventist	34	20.9
	Pentecostal	45	27.6
	Others	39	23.9
Highest Education	None	11	6.70
	Primary	53	32.5
	Secondary	57	35.0
	Tertiary	42	25.8
Employment status	Employed	37	22.7
	Unemployed	126	77.3
Months on therapy	Mean (±SD)	5.1 (3.3)	

M*=Mean,* ***SD****=Standard deviation*

Table 4.1 shows that over one third (35%) of the respondents were aged between 40 to 49 years. More than half (57.1%) of the respondents were single while 42.9% of women were married at the time of the study. Only one-third (42.9%) of the respondents were from within Lusaka province while 57.1% were referred from outside Lusaka province. The majority (58.9%) lived over 10 kilometres from the Cancer Diseases Hospital whereas, under a third (30.7%) resided within 5 kilometres of the health facility.

All study respondents were Christians, of which more than half belonged to the catholic and Pentecostal faiths (27.6% and 27.6%, respectively) while 20.9% Seventh-Day Adventists. Over one-third (35%) of the respondents attained secondary education followed by 32.5% with primary education. The results further showed that the majority (77.3%) of the

respondents were unemployed, and the mean reported length of therapy at the time of the study was 5.1

(±3.3) months ranging from as low as 3 months to as high as 40 months. (See table 4.1)

4.2.2 Prevalence of vaginal stenosis

This section presents findings on signs and symptoms of vaginal stenosis experienced and the overall prevalence of the condition.

Table 4.2: Sign and symptoms of vaginal stenosis experienced (n=163)

Signs of vaginal stenosis eexperienced	Always n (%)	Often n (%)	Sometimes n (%)	Rarely n (%)	Never n (%)
Vaginal pain	22 (13.5)	4 (2.5)	129 (79.1)	5 (3.1)	3 (1.8)
Vaginal bleeding	2 (1.2)	77 (47.2)	12 (7.4)	72 (44.2)	
Pain during sex	29 (17.8)	3 (1.8)	74 (45.4)	3 (1.8)	54 (33.1)
Tight vagina	91 (55.8)	8 (4.9)	48 (29.4)	4 (2.5)	12 (7.4)

Prevalence of vaginal stenosis (n=163)

This study has determined that only 42.3% of the respondents reported having signs/symptoms indicative of vaginal stenosis whereas 57.7% had no signs/symptoms indicating vaginal stenosis. Indicating a 42.3% prevalence of vaginal stenosis among the study population at CDH.

4.2.3 Practices contributing to vaginal stenosis

Practices of women contributing to vaginal stenosis are presented in this section.

Table 4.3: Practices contributing to vaginal stenosis (n=163)

Characteristics	Category	Frequency (n)	Percent (%)
Sexually active	Yes	98	60.1
	No	65	39.9
Frequency of sex	Weekly	50	51.0
	Twice a week	34	34.7
	≥3 times	14	14.3
Frequency of dilator use	Always	162	99.4

	Often	1	0.6
Control over dilator use	Yes	162	99.4
	No	1	0.6
Skipping dilator use	Always	69	42.3
	Often	94	57.7
Forgetting use of dilator	Always	53	32.5
	Often	110	67.5
Method of preventing vaginal stenosis used	Dilators	114 8	69.9
	Herbs		4.9
	Penetrative sex	41	25.2
Overall practices	**Good**	**124**	**76**
	Poor	**39**	**24**

As shown in table 4.3 above, the majority (60.1%) of the respondents were sexually active with slightly over half (51%) engaged in weekly sexual activity. Nearly all (99.4%) respondents reported using vaginal dilators always and being in control of their use while over half (57.7%) of the respondents often skipped their dilator use schedule and 67.5% of the respondents reported often forgetting to use the dilator. The results shows that the majority (69.9%) of the respondents reported that use of dilators was the method of preventing vaginal stenosis whereas a quarter (25.2%) reported that penetrative sex was the preventive measure.

The overall practice level in this study showed that the majority (76%) of the respondents reported good practices while the remaining 24% of the respondents had poor practices. (See table 4.3)

4.2.4 Attitudes Contributing to Vaginal Stenosis

Respondents' attitudes contributing to vaginal stenosis are outlined in the table below

Table 4.4: Attitudes contributing to vaginal stenosis (n=163)

Statement	Category	Frequency (n)	Percent (%)
Would skip use of the dilator when feeling better	Agree	163	100
Would skip use of the dilator when feeling sick	Strongly agree	8	4.9
	Agree	155	95.1
Would skip use of the dilator because of pain from the dilator	Strongly agree	6	3.7
	Agree	157	96.3

Would skip use of the dilator because it interferes with sexual life	Strongly agree Agree	3 160	1.8 98.2
Would skip use of the dilator because of discomfort	Agree	163	100
Would feel guilty after using a dilator	Strongly agree Agree	50 113	30.7 69.3
Avoids use of the dilator because of feeling sinful/embarrassed	Strongly agree Agree	3 160	1.8 98.2
Tradition forbids use of dilators as it is a taboo	Strongly agree Agree	4 159	2.5 97.5
Religion forbids use of dilators	Strongly agree Agree	4 159	2.5 97.5
Overall attitudes	**Positive** **Negative**	**10** **150**	**6.1** **93.9**

Table 4.4 shows that all respondents (100%) would skip the use of a dilator when they felt better and because of discomfort from the dilator. Similarly, most respondents (95.1%) reported that they would skip use of dilators because of feeling sick, 96.3% when they felt pain from the dilator, 98.2% of them when it interfered with their sexual life. Further, 98.2% of the respondents avoided use of dilators if they considered the practice as sinful/embarrassing, and 97.5% of the respondents avoided the use of dilators because their religion/tradition forbids use of vaginal dilators.

The overall attitude level among the study population showed that the majority (93.9%) of the respondents expressed negative attitude towards vaginal stenosis preventive measures with only 6.1% of the respondents demonstrating a positive attitude towards vaginal stenosis preventive measures. (See table 4.4)

4.2.5 Association between variables

This section tabulates tests for associations between vaginal stenosis and independent variables (practice, attitude and demographic characteristics). Bivariate analysis was as well employed to compare the interactions between independent and dependent variables.

Table 4.5. Association between vaginal stenosis and demographics, attitude and practices

Variable	Vaginal stenosis		P-value
	Yes, n (%)	No, n (%)	
Age in years 15 – 25 years	4 (50.0)	4 (50)	0.309[F]
26 – 39 years	22 (52.4)	20 (47.5)	
40 – 49 years	24 (42.1)	33 (57.9)	
At least 50 years	19 (33.9)	37 (66.1)	
Marital status Single	34 (37.6)	58 (62.4)	0.200[C]
Married	34 (48.6)	36 (51.4)	
Distance from CDH Under 5km	17 (34.0)	33 (66.0)	0.295[C]
5 – 10km	9 (52.9)	8 (47.1)	
Over 10km	43 (44.8)	53 (55.2)	
Religion Catholic	12 (26.7)	33 (73.3)	**0.019**[C]
Adventist	18 (52.9)	16 (47.1)	
Pentecostal	25 (55.6)	20 (44.4)	
Others	14 (35.9)	25 (64.1)	
Highest education level None	7 (63.6)	4 (36.4)	0.223[F]
Primary	21 (39.6)	32 (60.4)	
Secondary	20 (35.1)	37 (64.9)	
Tertiary	21 (50.0)	21 (50.0)	
Employment status Employed	20 (54.1)	17 (45.9)	0.101[C]
Unemployed	49 (38.9)	77 (61.1)	
Practices Good	52 (41.9)	72 (58.1)	0.855[C]
Poor	17 (43.6)	22 (56.4)	
Attitude Good	3 (30.0)	7 (70.0)	0.223[F]
Poor	66 (43.1)	87 (56.9)	
Length on brachytherapy Under 6 months	76 (61.3)	48 (38.7)	0.184[F]
6 – 12 months	16 (44.4)	20 (55.6)	
Over 12 months	2 (66.7)	1 (33.3)	

***C** = Chi-square test, **F**=Fisher's exact test, **CDH**= Cancer Diseases Hospital*

Table 4.5 shows that vaginal stenosis was significantly more common among Pentecostals (55.6%) and Adventists (52.9%) compared to Catholics (26.7%) and other religious groups (35.9%) (p=0.019). However, there was no significant association between vaginal stenosis and age, marital status, distance to CDH, education level, employment status, length on brachytherapy, attitude and practices (p > 0.05) at 5% level of significance.

Table 4.6: Univariable and multivariable logistic regression analysis estimates for the variable vaginal stenosis (n=163)

Variables	Univariable estimates			Multivariable estimates		
	OR	CI (95%)	p-value	OR	CI (95%)	p-value
Religious affiliation						
Catholic	**Ref**			**Ref**		
Seventh day Adventist	3.09	1.20, 7.95	**0.019**	3.52	1.27, 9.51	**0.015**
Others	1.54	0.61, 3.90	0.363	1.82	0.68, 4.87	0.235
Pentecostal	3.44	1.42, 8.32	**0.006**	3.92	1.49, 10.3	**0.005**
Education level						
None	**Ref**			**Ref**		
Primary	0.38	0.10, 1.44	0.153	0.43	0.11, 1.78	0.246
Secondary	0.31	0.08, 1.18	0.087	0.41	0.10, 1.69	0.218
Tertiary	0.57	0.15, 2.25	0.423	0.65	0.14, 2.99	0.583
Employment status						
Unemployed	**Ref**			**Ref**		
Employed	1.85	0.88, 3.87	0.103	1.76	0.73, 4.27	0.210
Practices						
Good	**Ref**			**Ref**		
Poor	1.07	0.52, 2.21	0.855	0.92	0.40, 2.12	0.854
Attitude	**Ref**			**Ref**		
Good						
Poor	1.77	0.44, 7.11	0.421	1.28	0.29, 5.71	0.746
Length on brachytherapy						
Under 6 months	**Ref**			**Ref**		
6 – 12 months	1.98	0.93, 4.19	0.074	2.45	1.03, 5.82	**0.042**
Over 12 months	0.79	0.07, 8.97	0.850	0.71	0.06, 9.10	0.795

***OR**= Odds Ratio, **CI**= Confidence Interval*

Table 4.6 shows estimates at Univariable and multivariable logistic regression analysis. The best-fit model was arrived at using an investigator led approach with guidance by statistics such as the AIC, BIC and goodness of fit and likelihood ratio test. At both univariate (OR=3.09, CI=1.20 –7.95, P=0.019: OR=3.44, CI=1.42 – 8.32, P=0.006) and

multivariable (OR=3.52, CI=1.27 – 9.51, P=0.015: OR=3.92, CI=1.49 – 10.3, P=0.005) analysis, women who belonged to seventh day Adventist and Pentecostal faiths had significantly higher odds of vaginal stenosis compared to women who belonged to the catholic faith.

The effect of increasing the level of education compared to having no formal education was to decrease the odds of vaginal stenosis at univariable and multivariable analysis. However, this predictive effect was not statistically significant at both levels of analysis. Similarly, women with poor practices compared to good practices, poor attitudes compared to good attitudes and those employed compared to unemployed had increased odds of vaginal stenosis. However, these increasing effects in odds of vaginal stenosis were not significant at 5% level of significance. On the other hand, although length n brachytherapy showed no significant effect at univariable analysis, the odds of having vaginal stenosis were 2.45 times higher for women who had been on brachytherapy between 6 and 12 months compared to those on brachytherapy for less than 6 months (OR=2.45, CI=1.03 – 5.82, P=0.042). This effect was significant at 5% significance level.

CHAPTER 5: DISCUSSION OF FINDINGS

5.1 Discussion

5.1.0 Introduction

The study was aimed to establish Attitudes and Practices Contributing to Vaginal Stenosis among Cervical Cancer Survivors Receiving Brachytherapy at Cancer Diseases Hospital in Lusaka, Zambia. This chapter discusses findings of the study, the extent to which they may be generalizable, the limitations of the study and recommendations are subsequently suggested. The discussion is presented in three sections according to the objectives of this study, namely Socio-Demographic characteristics, attitude and practices contributing to vaginal stenosis.

5.1.1 Socio-Demographic characteristics of women

The sample for the analyses included 163 women from 15 years and above. The most incident age range in this study reveals the involvement of older women, like the most incident age range of women who are diagnosed with cervical cancer (most cases in this study), from 40 years and older (Table 4.1). This however, was contrary to a study by Funston et al. who reported most incident age range of 25 to 49 years and reported that most women, when diagnosed with the disease, do not require brachytherapy, which is indicated when the disease is in more advanced stages (Funston et al., 2018).

It is also noteworthy that the results of the present study congruent to a study carried out in southern Brazil including women undergoing brachytherapy, which showed a minimum age of 44 years and a maximum of 77 years, with a mean age of 51 years and a more incident age range of 50-59 years. However, the same investigation showed that most women were single (57.1%), similar to the findings of this study (Duarte et al., 2020). In another study carried out with women submitted to brachytherapy as a treatment for cervical cancer, it is noteworthy that most cases occurred in the age group above 50 years (52.6%), which is the second most recurrent age in this investigation (Singh et al., 2017).

5.1.2 Incidence of vaginal stenosis (VS)

The findings of the present study indicated that the magnitude of radiotherapy-induced vaginal stenosis (RTIVS) stood at 42.3%. This finding falls within the reported incidence in literature of 1.2% to 88% (International Clinical Guideline Group, 2012). The described

incidence of RTIVS varies and depends on the treatment elements, tumor and patient factors. Developing
VS is dependent on the site of disease, RT modality and dose, coexisting chemotherapy, and other factors of the patient, such as age or constitutional radio-sensitivity of the tissues. The incidence of RT-induced VS is principally based on small patient groups and retrospective data; also, it depends on VS evaluation methods and used grading systems (Morris et al., 2017).

It is recognized that age >50 years increases the risk of VS for patients receiving pelvic/vaginal RT for cervical cancer (Brand et al., 2006). This is also true of the current study where older age was associated with VS. This could be due to the reduced sexual activity in old age. Further, the study found that nearly the entire sample had some form of education, although over a third of the sample had only achieved secondary education. However, Ndlovu in 2011 found that her sample had mainly achieved primary education contrary to our findings. The possible reason could be because of the study setting differences between the two studies, Ndlovu's study focused on rural setting while our study was focused on urban setting (Table 4.1). The study found no correlation between level of education and VS. Out of 163 respondents, 11 had not received any form of formal education at all of which only 7 showed some signs of the presence of vaginal stenosis. The prevalence of VS did not reduce as the level of education increased. The results from the study also showed that 77.3% of the women were unemployed and cross tabulation with VS showed that the incident of Vs was higher in unemployed women than those with an employment. However, the study could not compare this result with other studies because from the best of our knowledge this is the first study that assessed the relationship between RTIVS and socio-demographic characteristics considered in the study.

5.1.3 Attitudes of women contributing to vaginal stenosis

One of the objectives considered in this study was to establish the attitudes of women contributing to vaginal stenosis in women with cervical cancer following brachytherapy at the CDH. The results from this study show that majority (93.9%) of the respondents expressed poor attitude towards vaginal stenosis preventive measures as seen in figure 4.3. These included skipping the use of dilators when they felt better, when they had pain, felt sick and when measures interfered with their sexual life. This attitude contributes to development of vaginal stenosis.

In systematic review by Lee (2018) on the patients' perception and adherence to vaginal dilator therapy, it was reported that negative perceptions towards measures like Vaginal Dilators (VD) were frequently mentioned as a major barrier to VD therapy and a contributor to vaginal stenosis. Some women perceived VD as arduous, annoying, or bothersome chore (Bakker et al., 2015).

In a study by Edmond et al. it was reported that women emphasized positive perspectives toward VD as a facilitator of the therapy contrary to the findings of this study. Various reasons for this poor attitude such as tradition and religion not allowing use of preventive measures such as dilators were poorly linked to perceived risks associated with poor adherence to stated preventive measures. For these women (Edmonds et al., 2012), VD was an important therapy that made them feel better and retain a sense of normality while for the women in this study, dilators vaginal dilators interfered with their sexual life. The sense that vaginal adhesion was under control or that they themselves played an active role in postoperative recovery contributed to their continuous use of VD according to Bakker et al. (2015) but not as reported in this current study.

It is recognized that there may be poor compliance with preventive measures such as vaginal dilatation due to psychological distress and a lack of consistent or adequate information regarding dilator use (Cullen et al., 2012) is linked to the poor attitudes exhibited in this study.

The physical consequences of brachytherapy make women vulnerable in their marital relationships and in the psychological dimension, since they tend to strengthen a social role of submission. Vulnerability is a relative concept, but some studies characterize socially vulnerable people as those stigmatized, excluded, in need of help, in danger or deviating from what is socially considered as normal (Kröner and Beedholm, 2019; Carmo and Guizardi, 2018). In this study, women demonstrated having strong inclinations towards region and tradition as dictates of normality. However, when female vulnerability is emphasized, studies characterize vulnerable women as those who are at high risk of sexual abuse, are from groups deprived of emotional and psychological support, and are prone to suffer physical, psychological, sexual, and verbal violence within the family environment (Alimohammadi et al., 2016; Boldt, 2019); as well as experience uncomfortable sexual relationships for the maintenance of their social role of satisfying their partner, as in the experience of the women in this research.

5.1.4 Practices of women contributing to vaginal stenosis

In this current study, majority of the respondents (76%) exhibited goo practices towards factors contributing to vaginal stenosis. These practices included being sexually active and engaging in penetrative sexual activity weekly and the practice of using vaginal dilators always and being in control of their use. The perceived risks of developing vaginal stenosis with poor practices made women follow the recommendation such as vaginal al dilation therapy. The functions of dilatation therapy include minimizing vaginal stenosis and scarring, preventing adhesions, promoting improved vaginal healing, relaxing pelvic floor muscles, and preventing pain (Cullen et al., 2012). VD therapy also has psychological benefits for women, such as regaining confidence in the ability to insert an object into their vagina, an increased sense of control, and increased relaxation when experiencing pain (Carter et al., 2011).

The study found that nearly all (99.4%) of them indicated that they always use the dilator and that nearly all (99.4%) of the respondents had control over the use of dilators. The sociodemographic factors did not seem to have a significant impact on this variable since nearly all the respondents indicated that they practiced the use of dilators. This is supported by Daga et al. who strongly recommended either the use of a vaginal dilator or frequent sexual intercourse after completion of radiotherapy for cervical cancer survivors to maintain a healthy vaginal canal (Daga et al., 2017). However, a systematic review by Miles and Johnson concluded that there is no concrete evidence that routine regular vaginal dilation during RT treatment prevents stenosis or improves quality of life (Miles and Johnson, 2014).

Consequently, greater difficulty in the preventive approach (Miles and Johnson, 2014). According to Lee (2018) Others related VD to sexuality, perceiving the device as an embarrassing sex toy or sex aid, which for some was contrary to their cultural beliefs, still others reported perceiving VD as intrusive, violating, unnatural, mechanical, and cold (Cullen et al., 2012). In this study, all the respondents understood the use of VD as part of treatment.

Culturally, the woman should exercise mainly the role of reproducer, thus, she should always be able to have sexual intercourse with penetration, in order to contemplate her socially imposed functions as a woman and wife, always satisfying her partner's desires, not necessarily obtaining pleasure. In this way, the woman is put in a position of submission, where she must always be healthy in order to play her social role. Thus, those who are sick or with sequelae are not considered complete or functional women (Iżycki et al., 2016). In this

study, nearly all (97.5%) of the respondents indicated that their religious beliefs never allow the use of dilators however; 98.2% of the respondents indicated that they would never avoid using the dilator even if they felt like it was sin. Over two-thirds (69.3%) of the respondents indicated that they never felt guilty after using a dilator and the majority (96.9%) of respondents indicated that they never thought use of dilators affected their religious beliefs (Table 4.5, p. 33). And traditionally, nearly all (97.5%) of the respondents indicated that their traditional beliefs never allow the use of dilators however; 99.4% of the respondents indicated that they would never avoid using the dilator even if they thought they would against their traditional beliefs or teaching. Further, majority (82.2%) of the respondents indicated that use of dilators was likely a taboo in their tradition (Table 4.6, p. 34). The study found a poor cultural practice towards the use of VD in the prevention of RTIVS.

According to the participants' reports, it is possible to interpret that a woman has a "sexual obligation" to fulfil with their partners, which occurs for cultural reasons. During the illness, these obligations continue, however, the participants realize that their body is no longer able to perform this role, which generates conflicts in the maintenance of their marital relationships. Women, culturally in the social world, have a greater predisposition for self-care in health, because they are imposed the social role of procreating, nurturing, and always taking care of the family, being constantly placed as inferior to their spouses and having to obey their wills. In a study conducted in North America, which discusses the social role of women, it is observed that the female figure should always resemble as much as possible the religious figures, having to cultivate the preservation of virginity, as well as only have sex to satisfy the spouse (Diaz and Bui, 2017) similar to the reports found in our study.

5.2 Application of theory to research findings

In this study, the HBM was used as a theoretical lens to assess women's attitude and practices regarding the use of VD in the prevention of RTIVS. The HBM explains and predicts an individual's health behaviours using the attitudes and beliefs toward disease, especially perceived barriers, perceived benefits, and perceived susceptibility. The HBM stipulates that one's health-related behavior depends on one's perception of six important areas: the severity of a potential illness (cervical cancer); one's susceptibility to that illness (perceived risk of developing the disease); the benefits of taking a preventive action (taking care of one's health and family responsibility by participating in VD therapy); the barriers to taking that action (i.e., side effects, unpleasant, time-consuming, or inconvenient); cues to action that motivate one to take action; and self-efficacy.

Perceived Severity: The participants' health behaviours identified in this study were consistent with the theoretical framework of the HBM. The majority of the participants believed knew that vaginal stenosis was a severe outcome. Participants had personal experiences that influenced and affirmed their belief of the distressing nature of the disease. These experiences directly lead to fear of the disease and its consequences for the family system or structure. This overall fear of the disease and the strong sense of family responsibility often directed the participants' adherence to preventive measures.

Perceived Susceptibility: According to Salazar (1991), the individual's personal perceived susceptibility to any given disease and the perceived severity of the consequences of the disease on the individual's life is one of the most powerful perceptions or beliefs that drive individuals to change their behaviours or adopt new healthier behaviours. However, this perception of susceptibility may vary widely with each individual. Most of the participants perceived they were at risk for developing VS because they were on therapy for cervical cancer. However, it is important to consider the positive practices as a response to susceptibility.

Perceived Benefits: Most of the participants also believed that to prevent any type of illness, including VS, one must maintain practice prevention. In addition to a strong sense of responsibility for maintaining one's health to support family, several participants also expressed a sense of social duty to adhere to the recommended VD usage criteria.

In conclusion, the expanded HBM is a useful framework to explore the participants' perceived severity and susceptibility to VS and the benefits of taking up measures to prevent it.

5.3 Implications of the study finding

5.3.1 Practice

There is need for oncology staff in practice to enhance positive attitudes towards measures contributing to minimize development of vaginal stenosis. This should cover all possible action including those which may not be favoured by feelings, tradition and religion. There is an opportunity for the oncology staff to reshape their health education messages from this study.

5.3.2 Administration

The policy level should ensure that adequate resources for vaginal stenosis prevention activities are available in all health facilities in the country. Information pamphlets or posters should be user

friendly i.e., translated to the local language and also distributed to the female population as widely as possible. The health managers should review packaging of information so as to simplify complex terminology when necessary to enhance understanding by all women.

5.3.3 Education

The training institutions should review pre-service curricula and incorporate radiotherapy induced vaginal stenosis core competencies in nursing curricula.

5.4 Recommendations

Based on the findings, the following recommendations are made:

1. Patients should be advised by their oncologist at the outset of treatment about the risk of VS and its consequences with regard to sexual function and post treatment surveillance.
2. Practical advice about using vaginal dilator should be provided by a trained member of treatment team.
3. Psychosocial support and education should be provided if RT-induced VS occurs.
4. Vaginal morbidity should be assessed at baseline, 3 monthly for first 2 years and then 6 monthly for subsequent 3 years until discharge from ongoing surveillance.
5. Patient education regarding VS is part of the care and must be provided by radiation oncologists who treat women with gynecological, anal and rectal cancers.
6. Health care providers must proactively provide health related massages for the patients to acquire more knowledge on the use of vaginal dilator. All Healthcare facilities in Zambia should be educated about the use of vaginal dilators by cervical cancer women who receive brachytherapy so that necessary vaginal dilator accessories can easily be accessed by those who stay far from CDH.

5.5 Utilisation and Dissemination of Findings

The findings of this study will be disseminated by presenting a bound report to the School of Nursing Sciences at UNZA to serve as reference to other researchers. Other bound reports will be presented to the library, school of Medicine and UTH. The researcher also intends to present the findings through workshops, or publication as opportunity arises.

It is hoped that the results of the study will be used by oncology professionals in practice to guide information dissemination and targeted interventions to change attitudes and promote

practices on the use of dilators in the prevention of vaginal stenosis following brachytherapy in Zambia.

5.6 Strengths and Limitations of the Study

5.6.1 Strengths of the Study

The study has provided an in-depth view of the topic and because quantitative data is in numeric form, statistical tests have been applied such as chi-square test and multivariate statistics which helped to meet the objectives of the study.

5.6.2 Limitations

The major limitations that encountered during this study are that, firstly the presence of covid19 prolonged the data collection process as there were restrictions to access respondents. There is only one cancer diseases in Zambia and as such the scope of the study was limited.

The lack of standardized VS measures and methods of addressing VS made it difficult to correlate results from different studies. Furthermore, time to do the proposal was not enough in that being academic research it had a fixed deadline on which to submit it thus the research was conducted in a short period of time possibly some details were likely to be left out.

The average sample size may well have masked real differences between the groups that could not be detected due to very wide confidence intervals in some analyses. The weakness of this analysis is that the sample is average but the results cannot be generalizable to other populations in which studies on cervical cancer knowledge and perceptions are conducted.

5.7 Conclusions

Radiation-induced VS is a commonly observed side effect following treatment with pelvic RT for uterine, cervical, vaginal and anorectal cancers. Survivorship care should prioritize and recognize the potential negative impact of VS on the physical and psychological well-being of patients. However, there is a paucity of high-level evidence of the attitudes and practices on prevention and management strategies for VS, and more up-to-date empirical data are required. The effect of increasing the level of education compared to having no formal education was to decrease the odds of vaginal stenosis. However, this predictive effect was not statistically significant at both levels of analysis in this study. Similarly, women with poor practices compared to good practices, poor attitudes compared to good attitudes and those employed compared to unemployed had increased odds of vaginal

stenosis. On the other hand, although length n brachytherapy showed no significant effect, the odds of having vaginal stenosis were 2.45 times higher for women who had been on brachytherapy between 6 and 12 months compared to those on brachytherapy for less than 6 months. Failure to practice recommended measures and poor attitudes towards therapy contributes to vaginal stenosis. Efforts should be channeled towards overcoming religious, traditional, cultural and personal impediments contributing to vaginal stenosis in women with cervical cancer receiving brachytherapy.

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ANNEX

ANNEX 1: PARTICIPANTS INFORMATION SHEET

Attitudes and Practices Contributing to Vaginal Stenosis among Cervical Cancer Survivors Receiving Brachytherapy at Cancer Diseases Hospital in Lusaka, Zambia.

1.Introduction

My name is Royda C. Matipa, and I am a Master Science in Nursing student at the university of Zambia (institute of distance education). My field of specialization is midwifery and women's health. The research I wish to conduct involves establishing attitudes and practices contributing to vaginal stenosis (narrowing of the vagina) in women with cervical cancer following brachytherapy (radiation). This non-experimental – meaning that there will be nothing done on your body physically.

2. Invitation

You are being invited to take part in this research project. Before you decide to do so, it is important you understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part. Thank you for reading this.

What is the research's' purpose?

This research is set to establish practices, beliefs and attitudes that contribute to vaginal stenosis in cervical cancer patients following brachytherapy. This study builds on research previously carried out by the research team and that of others and has been designed to allow comparisons with previous findings.

Why have I been chosen?

You have been randomly chosen because you fit in the criteria of patients who are receiving brachytherapy as a result of cervical cancer. You also stand out to be helpful even as you narrate your experiences with cervical cancer and brachytherapy.

Do I have to take part?

It is up to you to decide whether or not to take part. If you do decide to take part, you will be able to keep a copy of this information sheet and you should indicate your agreement to the online consent form. You can still withdraw at any time. You do not have to give a reason.

What will happen to me if I take part?

You will be asked to complete a structured questionnaire which I will personally administer over an estimated period of 30-45 minutes. You may also wish to agree to a follow-up interview to find out more about your thoughts.

What do I have to do?

Please answer the questions in the questionnaire. There are no other commitments or lifestyle restrictions associated with participating.

What are the possible disadvantages and risks of taking part?

Participating in the research is not anticipated to cause you any disadvantages or discomfort. The potential physical and/or psychological harm or distress will be the same as any experienced in everyday life of talking to a stranger.

What are the possible benefits of taking part?

Whilst there are no immediate benefits for those people participating in the project, it is hoped that this work will have a beneficial impact on to prevent vaginal stenosis among women receiving brachytherapy. Results will be shared with health workers and patients in general in order to inform their professional work and conduct respectively.

What happens if the research study stops earlier than expected?

Should the research stop earlier than planned and you are affected in any way we will tell you and explain why.

What if something goes wrong?

If you have any complaints about the research in the first instance you can contact my supervisor or the Medical Superintendent at the CDH. If you feel your complaint has not been handled to your satisfaction you can contact the Director at the CDH.

Will my taking part in this project be kept confidential?

All the information that we collect about you during the course of the research will be kept strictly confidential. You will not be able to be identified or identifiable in any reports or publications. Any data collected about you in the questionnaire will be stored on computer in a form protected by passwords and other relevant security processes and technologies. Data collected may be shared in an anonymized form to allow reuse by the CDH or University. These anonymized data will not allow any individuals or their institutions to be identified or identifiable.

Will I be recorded, and how will the recorded media be used?

You will be recorded using a phone for the purpose only of analyzing the data after the interview. This will also help to capture correct impressions about your views.

What type of information will be sought from me and why is the collection of this information relevant for achieving the research project's objectives?

The questionnaire will ask you about your opinions and experiences regarding cervical cancer and treatment with brachytherapy. The focus really is on prevention of vaginal stenosis. Your views and experience are just what the study is interested in exploring.

What will happen to the results of the research?

Results of the research will not be shared with the public. It will be kept in the Library at the University of Zambia. If you wish to be given a copy of any reports resulting from the research, please ask us to put you on the circulation list.

Who is organizing and funding the research?

No one is funding the research because this is purely academic research organized by myself in conjunction with the University of Zambia.

3. Who has ethically reviewed the Research? This research has been ethically approved by the University of Zambia Students Research Ethics Committee.

18. **Contacts for further information**

The Chairperson,

University of Zambia

Biomedical Research Ethics Committee (UNZABREC)

Ridgeway Campus

Lusaka.

Tel. 260-1-256067

Or

The researcher (myself)

Royda Matipa

B/160

Rephidim, Lusaka West.

Contact: 0977466200

My Supervisors

Dr. Catherine Ngoma - 0966652879 House

Ms. Mayimbo S - 0977767008

Thank you for taking part in this research.

ANNEX 2: CONSENT TO TAKE PART IN RESEARCH

TOPIC: ATTITUDES AND PRACTICES CONTRIBUTING TO VAGINAL STENOSIS AMONG CERVICAL CANCER SURVIVORS RECEIVING BRACHYTHERAPY AT CANCER DISEASES HOSPITAL IN LUSAKA, ZAMBIA

I…… voluntarily agree to participate in this research study.

I understand that even if I agree to participate now, I can withdraw at any time or refuse to answer any question without any consequences of any kind.

I understand that I can withdraw permission to use data from my interview within two weeks after the interview, in which case the material will be deleted.

I have had the purpose and nature of the study explained to me in writing and I have had the opportunity to ask questions about the study.

I understand that participation involves responding to questions from the administered questionnaire.

I understand that I will not benefit directly from participating in this research.

I agree to my interview being audio-recorded.

I understand that all information I provide for this study will be treated confidentially.

I understand that that privacy will be ensured during the course of the interview as the interview will be conducted in a secluded room.

I understand that in any report on the results of this research my identity will remain anonymous. This will be done by changing my name and disguising any details of my interview which may reveal my identity or the identity of people I speak about.

I understand that disguised extracts from my interview may be quoted in report and academic documents.

I understand that if I inform the researcher that I or someone else is at risk of harm they may have to report this to the relevant authorities - they will discuss this with me first but may be required to report with or without my permission.

I understand that signed consent forms and original audio recordings will be retained in on computer until the University confirms the results of this dissertation.

I understand that under freedom of information legalization I am entitled to access the information I have provided at any time while it is in storage as specified above.

I understand that I am free to contact any of the people involved in the research to seek further clarification and information.

I also understand that in case I have questions or concerns on the manner the study is conducted or I have been treated, I can contact:

The Chairperson,

University of Zambia

Biomedical Research Ethics Committee (UNZABREC)

Ridgeway Campus

Lusaka.

Tel. 260-1-256067 **Or**

the researcher (myself)

Royda Matipa

House # B/160

Rephidim, Lusaka West.

Contact: 0977466200

Signature of research participant ---------- Date ----------

Thumb print in case not signing

Signature of researcher

I believe the participant is giving informed consent to participate in this study

Signature ---------- date ----------

ANNEX 3: QUESTIONNAIRE

No._____

THE UNIVERSITY OF ZAMBIA SCHOOL OF NURSING SCIENCES TOPIC: ATTITUDES AND PRACTICES CONTRIBUTING TO VAGINAL STENOSIS AMONG CERVICAL CANCER SURVIVORS RECEIVING BRACHYTHERAPY AT CANCER DISEASES HOSPITAL IN LUSAKA, ZAMBIA

I am a student at the University of Zambia pursuing studies in Nursing Sciences. You have been randomly picked to participate in this academic survey where we are trying to establish attitudes and practices contributing to vaginal stenosis in women with cervical cancer following brachytherapy. Your participation is purely voluntary and therefore I seek your consent to respond to brief questions below.

Date of interview……...

Place of interview……. **Name**

of interviewer……

Serial number of the interviewee……...

INTRODUCTION TO THE INTERVIEWER

1. Introduce yourself to the interviewee(s)
2. Explain the purpose of the interview
3. Get verbal consent from the interviewee before conducting the interview.
4. Assure the interviewee of confidentiality and anonymity.
5. Do not write the name of the respondent on the interview schedule to ensure anonymity.

SECTION A: DEMOGRAPHIC DATA

1. Age in years ----------
2. What is your marital status?
   (a) Single ☐ b. Married
3. In which township do live in…….
4. How far do you live from this health facility?
   (a) Less than 5km ☐ Between 5 and 10km ☐ Over 12 km ☐
5. What is your religious denomination?
   (a) Roman Catholic ☐ Seventh Day Adventist ☐ Jehovah's Witness ☐ Pentecostal Others (Specify)……

6. What is your Level of education?

   b. Primary ☐ c. Secondary ☐ d. Tertiary ☐

7. What is your occupation?

   (a) Employed ☐ Unemployed

8. When were you diagnosed with cervical cancer? …….

9. What type of Cancer of the cervix treatment have you received?

   a. Surgery plus chemo radiation ☐ b. ☐ Radiotherapy ☐

   b. Surgery plus radiotherapy ☐ Chemo radiation ☐☐

10. For how long have you been receiving radiation therapy?

SECTION B: ATTITUDES CONTRIBUTING TO VAGINAL STENOSIS

	SA	A	N	D	SD
11. Would skip use of the dilator when feeling better					
12. Would skip use of the dilator when feeling sick					
13. Would skip use of the dilator because of pain from the dilator					
14. Would skip use of the dilator because it interferes with sexual life					
15. Would skip use of the dilator because of discomfort					
16. Would feel guilty after using a dilator					
17. Avoids use of the dilator because of feeling sinful/embarrassed					
18. Tradition forbids use of dilators as it is a taboo					
19. Religion forbids use of dilators					

SECTION C: PRACTICES CONTRIBUTING TO VAGINAL STENOSIS

20. Are you sexually active?
    a. Yes ☐
    b. No ☐

21. If yes to Q 20, what is the frequency of sex?
    a. Weekly ☐
    b. Twice a week ☐
    c. ≥3 times ☐

22. How often do you use your vaginal dilator?
    a. Always ☐
    b. Often ☐

23. Do you have control over the use of your vaginal dilator?
    a. Yes ☐
    b. No ☐

24. How often do you skip using your vaginal dilator?
    a. Always ☐
    b. Often ☐

25. How often do you forget to use your vaginal dilator?
    a. Always ☐
    b. Often ☐

26. Which one of the following is the most effective way of preventing vaginal stenosis?	**Very Important**	**Important**	**Moderately Important**	**Slightly Important**	**Unimportant**
Dilators					
Prayer					
Herbs					
Vaginal drying agents					
Vaginal douching					
Penetrative sex only					

None (state the option you are using or preferred)	

SECTION D: VAGINAL STENOSIS

27. Signs of vaginal stenosis eexperienced	**Always**	**Often**	**Sometimes**	**Rarely**	**Never**
a. Vaginal pain					
b. Vaginal bleeding					
c. Pain during sex					
d. Tight vagina					

End of interview

Thanks for your participation

ANNEX 4: LETTER FOR ETHICAL APPROVAL

The University of Zambia
Institute of Distance Education
Department of Nursing Sciences (Post Graduate)
Lusaka
Cell: 0977466200
Email: roydahmatipa@yahoo.co.uk
30th May, 2021

The Chairperson
UNZA Research Ethics Committee
Lusaka, Zambia

Dear sir/madam,

REQUEST FOR ETHICAL APPROVAL TO CONDUCT RESEARCH AT THE CANCER DISEASES HOSPITAL

My name is Royda Chibale Matipa, and I am a Master Science in Nursing student at the University of Zambia (Institute of Distance Education). My field of specialization is midwifery and women's health. The research I wish to conduct for my Master's dissertation involves establishing attitudes and practices contributing to vaginal stenosis in women with cervical cancer following brachytherapy. This will be a non-experimental study. The study will be conducted under the supervision of Dr. Catherine Ngoma from the University of Zambia School of Nursing sciences and co-supervised by Ms. Mayimbo Sebean.

I am hereby seeking your approval to conduct the above academic study. The ethical requirements for conducting research will be observed. Informed consent will be sought from each study participant prior to enrolment. In the event that the respondent refuses to take part in the research, they will be replaced and all respondents will be treated as anonymous to avoid identification. In situations where the respondent desires to withdraw and it is outside the control of the interviewer, they will be freely allowed to do and all their information shredded immediately. Information that will be obtained during the study will be treated with utmost confidentiality as it borders on personal information which most people would rather keep to themselves. And the end of this study all the recorded responses and verbatim will be will be destroyed.

I have provided a copy of my dissertation proposal which includes copies of the measure and consent and assent forms to be used in the research process. Upon completion of the study, I undertake to provide the Department of Nursing Sciences with a bound copy of the full research report. If you require any further information, please do not hesitate to contact me on +260977466200, email roydahmatipa@yahoo.co.uk and my Supervisor on Dr. Catherine Ngoma - 0966652879

Ms. Mayimbo S - 0977767008

Thank you for your time and consideration in this matter.

Yours sincerely,

Royda Chibale Matipa

ANNEX 5 : ETHICAL APPROVAL LETTER

UNIVERSITY OF ZAMBIA

BIOMEDICAL RESEARCH ETHICS COMMITTEE

Telephone: +260 977925304
Telegrams: UNZA, LUSAKA
Telex: UNZALU ZA 44370
Fax: + 260-1-250753

Ridgeway Campus
P.O. Box 50110
Lusaka, Zambia
E-mail:
unzarec@unza.zm **Federal Assurance No. FWA00000338**
IRB00001131 of IORG0000774

16th August 2021

Your REF. No. 1770-2021

Mrs. Royda Chibale Matipa,
University of Zambia,
School of Nursing,
P.O Box 50110,
Lusaka.

Dear Mrs. Matipa,

RE: ATTITUDES AND PRACTICES CONTRIBUTING TO VAGINAL STENOSIS IN WOMEN WITH CERVICAL CANCER FOLLOWING BRACHYTHERAPY (REF. NO. 1770-2021)

The above-mentioned research proposal was presented to the Biomedical Research Ethics Committee meeting on 9th August 2021. 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. 1770-2021

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

- **APPROVAL DATE : 16th August 2021**
- **TYPE OF APPROVAL : Ordinary**
- **EXPIRATION DATE OF APPROVAL : 15th August 2022**

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.

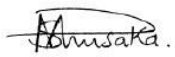
- **SERIOUS ADVERSE EVENT REPORTING**: All SAEs and any other serious challenges/problems having to do with participant welfare, participant safety and study integrity

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 has to 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. 00260977925304 or by email on unzarec@unza.zm.
- **OTHER**: Please be reminded to send in copies of your research findings/results for our records. You are 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 for further submissions.

Yours sincerely,



Sody Mweetwa Munsaka, BSc., MSc., PhD
CHAIRPERSON
Tel: +260977925304
E-mail: s.munsaka@unza.zm

ANNEX 6: LETTER TO CONDUCT RESEARCH AT CANCER DISEASES HOSPITAL

The University of Zambia
Institute of Distance Education
Department of Nursing Sciences (Post Graduate)
Lusaka
Cell: 0977466200
Email: roydahmatipa@yahoo.co.uk
30th August, 2021

The Director
Cancer Diseases Hospital
Nationalist Road
Lusaka, Zambia

Dear sir/madam,

REQUEST FOR PERMISSION TO CONDUCT RESEARCH AT THE CANCER DISEASES HOSPITAL

My name is Royda Chibale Matipa, and I am a Master Science in Nursing student at the university of Zambia (institute of distance education). My field of specialization is midwifery and women's health. The research I wish to conduct for my Master's dissertation involves establishing attitudes and practices contributing to vaginal stenosis in women with cervical cancer following brachytherapy. This non-experimental. This study will be conducted under the supervision of Dr. Catherine Ngoma from the University of Zambia School of Nursing sciences and co-supervised by Ms. Mayimbo Sebean.

I am hereby seeking your consent to use the CDH hospital facilities for the purposes of data collection, analysis and report writing. The process will involve interviews with Patients and members of staff at CDH.

I have provided a copy of my dissertation proposal which includes copies of the measure and consent and assent forms to be used in the research process, as well as a copy of the approval letter which I received from the UNZA Research Ethics Committee.
Upon completion of the study, I undertake to provide the Department of Nursing Sciences with a bound copy of the full research report. If you require any further information, please do not hesitate to contact me on +260977466200, email roydahmatipa@yahoo.co.uk and my Supervisor; Dr. Catherine Ngoma - 0966652879

Ms. Mayimbo S - 0977767008

Thank you for your time and consideration in this matter.
Yours sincerely,
Royda Chibale Matipa