SEXUAL FUNCTION IN WOMEN AFTER CERVICAL CANCER TREATMENT AT AN ACADEMIC HOSPITAL IN JOHANNESBURG, SOUTH AFRICA

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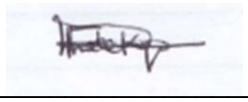
DECLARATION

I, Imoleayo Elizabeth Fakunle declare that this research report is my own work. It is being submitted for the degree of Master of Science in Nursing in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at this or any other University.



Imoleayo Elizabeth Fakunle

Signed on the 11th day of May, 2016

Dedicated to my ever loving parents, Mr. and Mrs. Fakunle,

who have always supported, encouraged and guided me.

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ABSTRACT

Background: Cervical cancer is treated in various ways depending on the stage of the disease. The International Atomic Energy Agency guides the management of cervical cancer in resource limited countries. Due to advancement in the existing treatment modalities, a higher survivorship rate occurs in women who receive treatment. However, evidence states that cervical treatment has pronounced effects on sexual functioning which persists for long periods after treatment.

Purpose: The purpose of the study was to explore the sexual function in women after completion of treatment at an academic hospital in Johannesburg, South Africa.

Methods: A cross sectional design was used in the study. The sampling method was convenience and used a calculated sample size of 147 (n =147). Structured interviews collected the data and the Female Sexual Function Index (FSFI) served as data collection instrument. Kruskal Wallis tests were used to determine statistical significant difference between variables.

Results: The majority of the women (94.6%; n=139) experienced sexual dysfunction which persisted over time. The most affected domains in sexual function were arousal and desire, while satisfaction was the least affected domain. Pain experienced during sexual activity after treatment persisted as time progressed.

Conclusion: The majority of women treated for cervical cancer at an academic hospital in the Gauteng Province live with long lasting sexual dysfunction affecting all the domains of their sexual function. Although sexual dysfunction reached the highest level in the third month after treatment, there was little improvement over time. Age, educational level and sexual counselling before treatment did not influence sexual function.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ABBREVIATIONS

IAEA International Atomic Energy Agency

FSFI Female Sexual Function Index

ASR Age Standardised incidence Rate

CHAPTER 1

ORIENTATION FOR THE STUDY

1.1 BACKGROUND FOR THE STUDY

According to the International Agency for Research on Cancer and World Health Organization (Cancer, 2013), cancer accounted for 8.2 million deaths worldwide with 14.1 million people newly diagnosed and a population of 32.6 million living with cancer in 2012. Cervical cancer is rated as the fourth most common cancer in women in the world and also the fourth most common cause of death in women worldwide with the highest being lung cancer. In 2012, there were 528,000 women newly diagnosed with cervical cancer and 266,000 cervical cancer related deaths worldwide. This represents 7.5% of cancer mortality in women with a proportion of 87% found in developing countries (GLOBOCAN, 2012). Every year in Sub Saharan Africa, there is an estimate of 38.4 newly diagnosed women per 100,000 whilst 22.5 per 100,000 women would die from this disease (GLOBOCAN, 2012).

In Africa, with a population of about 267.9 million women above the age of 15 years, it is estimated that 80,000 women are diagnosed with cervical cancer each year and more than 6,000 end up dying reflecting a high mortality rate (Denny and Anorlu, 2012). The age standardised incidence rate of cervical cancer per 100,000 in Africa is 28 in middle Africa, 42 in the Eastern part, 38.2 in South Africa, 29.3 in the West, 12.1 in North Africa, with the largest occurrences in East Africa (Denny, 2010). Presently, there is no recent record of newly diagnosed women or deaths annually in South Africa due to an improper maintenance of the cancer registry (Maree et al., 2013), however, the most current records show cervical cancer was responsible for the deaths of 5270 in 2009 and 5433 in 2010 (National Cancer Registry, 2010).

Cervical cancer is treated in various ways depending on the stage of the disease. The International Atomic Energy Agency guides the management of cervical cancer in resource limited countries (International Atomic Energy Agency, 2012). These guidelines ensure effective evidence based health outcomes for women through the selection of appropriate treatment regimens depending on the stage of the disease. Curative treatment for invasive cancer consists of radiotherapy, brachytherapy, chemo-radiotherapy and surgery. However, for stage IIB-IVA cervical cancer, surgery is contra-indicated and external beam radiation, brachytherapy, with or without chemotherapy, is recommended. Women with Stage IVB cervical cancer can be treated with radiotherapy, with or without chemotherapy. Palliative

treatment and care is recommended in women with distant metastasis and the use of surgery and radiotherapy are dependent on the patients' status and predicated period of survival (International Atomic Energy Agency, 2012).

Unfortunately cancer and its treatment are associated with acute and chronic side effects which have a negative influence on women's physiological, social, psychological and sexual health. For instance, chemotherapy leads to loss of ovarian function, decreased vaginal secretion and physiological fatigue. Radiotherapy to the pelvis has effects such as damage to the nerves and tissues of the vagina (Abbott-Anderson and Kwekkeboom, 2012), vaginal dryness, reduced lubrication, stenosis, atrophy and shortening of the vagina, decreased elasticity and fibrosis of vaginal tissues and wall (White et al., 2011).

According to Davidson (2011), cervical cancer treatment has pronounced effects on sexual functioning, sexual health and sexual activities which persist for a long period even after treatment (Reese, 2011) and have a negative influence on the quality of life or the woman (Davidson, 2011). Furthermore, alterations in sexual functioning can influence intimacy and relationships leading to emotional problems and distress, depression, low self-esteem and body image disturbances (Graziottin et al., 2009). Certain psychological responses such as fear of pain, altered level of femininity and anxiety also affect sexual responses (White et al., 2011) which can serve as a constant reminder of living with cancer (Royo et al., 2014).

1.2 PROBLEM STATEMENT AND SIGNIFICANCE OF THE STUDY

Little is known about the sexual functioning of South Africa's women living with cervical cancer, as no African or South African study could be found which explores this important issue. Unfortunately patient's psychosexual support needs are neglected and not enquired about despite the fact that a significant number of cancer patients need the opportunity to discuss their sexual concerns (Forster, 2004). This study would therefore raise awareness of sexuality in cancer care by providing baseline data regarding the sexual functioning of women having to live with cervical cancer and its treatment. In addition, knowledge on sexual functioning is essential for nurses to provide evidence based holistic care to these women.

1.3 RESEARCH QUESTION, PURPOSE AND OBJECTIVES OF THE STUDY

The research question for the study is: *What is the sexual functioning in women treated for cervical cancer at an academic hospital in Johannesburg, South Africa?* The purpose of the study is to explore the sexual functioning of women after being treated for cervical cancer at an academic hospital in Johannesburg, South Africa. The study aimed at exploring the sexual functioning of women treated for cervical cancer in the third, sixth and twelfth months after completing the treatment.

1.4 RESEARCH DESIGN AND METHODS

The study was quantitative and exploratory and used a cross sectional research design and conducted at the radiation oncology department of an academic hospital in Johannesburg in the Gauteng Province, South Africa. Data were collected from different women during their normal scheduled appointments at the radiation oncology clinic three (3) months, six (6) months and twelve (12) months after completing treatment.

The study population consisted of women who were 18 years and older who had completed curative treatment for cervical cancer at the radiation oncology department. The sample was calculated to be 147 (n=147); with 49 (n=49) in each of the three groups. Convenience sampling was used and women were recruited for the study whilst waiting for their follow up assessment. Structured interviews were conducted and the Female Sexual Function Index (FSFI) served as an interview guide. The data were analysed using the SPSS 22 statistical programme and the Kruskal Wallis test determined significance differences between the groups.

1.5 DEFINITION OF KEY TERMS

Sexual health is a state of physical, mental and social well-being in relation to sexuality and requires a positive and respectful approach to sexuality and sexual relationships and the possibility of having pleasurable and safe sexual experiences free of coercion, discrimination and violence (World Health Organization, 2013).

Cervical cancer is a malignant growth from uncontrolled cell division which invades the tissues of the cervix in a woman (National Cancer Institute, 2012).

Sexual function is an integration of sexual activities, sexual desires, arousal, orgasm, lubrication and satisfaction in women (Graziottin et al., 2009).

Female sexual dysfunction is a state in which there is a disorder in any of the components which make up the phases of the female sexual process (Rosen et al, 2000). The assessment of female sexual dysfunction will be done according to the six domains identified by Rosen et al (2000) in the design of a tool used in measuring the sexual function of females

1.6 FORMAT OF THE RESEARCH REPORT

This study will be presented as follows:

Chapter one: Introduction and background

Chapter two: Literature review

Chapter three: Research design and methods

Chapter four: Results and discussion

Chapter five: Recommendations, conclusion and summary

References

Appendices

CHAPTER 2

LITERATURE REVIEW

Chapter 1 reflected the background, significance as well as the purpose of the study. This chapter gives a succinct review of cancer as a health problem and sexual function in cervical cancer patients. It explores the concept of cervical cancer, its treatment modalities, related side effects and closes with a review on sexual function in women treated for cervical cancer.

2.1 CANCER AS A GLOBAL HEALTH ISSUE

Cancer is gradually on the increase and is likely to become a disease of high mortality and morbidity globally in years to come. Predictions by the United Nations state that the population globally by the year 2030 will stem up to 8.3 billion. The steady increase in world population will directly reflect an increase in the incidence of cancer to 20.3 million and a mortality rate of 13.2 million. This reflects a global increase and burden in comparison to the estimate figures of 12.7 million in 2008 and 14.1 million in 2012, while mortality figures were 7.6 million in 2008 and 8.2 million in 2012 (GLOBOCAN, 2012). Worldwide, there is a steady development in societies and economies of countries. This has a direct influence on the increase in the ageing population, increase in growth figures and increasing incidences of all forms of cancers and deaths resulting from cancers. Due to population increase and economic developments in countries, various risk factors for cancers such as life styles, changes in diet patterns and hormonal changes are also contributory factors to the increasing burden of cancers (Bray et al., 2012).

Though certain geographical regions have had high records of incidence rates for specific types of cancers, this could be as a result of variations in the distribution of the risk factors and a mix of other prevailing factors, such as prevention and early intervention. Generally, in 2012, the less developed countries had a population more than half of the global burden of cancer (56.8%) and a mortality rate of 64.9% when compared to highly developed countries and these figures are projected to increase in years to come (Ferlay et al., 2014). Worldwide, as stated by the International agency for Research on Cancer, the most common cancers are cancers of the lung, breast, colorectal, stomach, prostate, liver and cervix (GLOBOCAN 2012). These forms of cancer make up 58% of the entire burden worldwide (Bray et al., 2012).

Cervical cancer is the fourth most common cancer in women with the highest cancer mortality rate in 55 countries found in Sub Saharan Africa, Asia, Central and South American

countries. Also, a record of about 528,000 women was newly diagnosed with cervical cancer worldwide with a proportion of 85% found in less developed countries (World Health Organization, 2014). In addition, 266,000 women died of cervical cancer in low to middle income countries, while only 1 in 10 women died from cervical cancer in high income countries. This huge difference can be attributed to an ineffective cancer control programme of prevention, early detection and treatment services in those countries leading to women presenting late at an advanced stage, hence the high mortality rate (World Health Organization, 2014)

In Sub Saharan Africa, cancer is on the increase due to the high rate of communicable diseases, prevalence of HIV/AIDS, various infections, malaria and other health problems. However, cancer has not been given high priority in health. Also, many regions have limited resources to aid in early identification of risk factors, appropriate screening services and proper preventive measures in cancer control. Population records also reflect an increase in population aging and growth, along with a high rise in predisposing factors to various forms of cancer. Like other parts of the world, socio-economic development and changes in life style further predispose individuals to cancer (World Health Organization, 2014).

The rate of cervical cancer incidence differs from geographic regions. In South Africa, cervical cancer is the second most common cancer in females while being the fourth worldwide. It has an Age Standardised incidence Rate (ASR) of 31.5 and remains the most common cancer in females of Eastern and Central Africa (World Health Organization, 2014). Unfortunately, in the developing regions of the world, most women with cervical cancer present at advanced stages, which is then too late to be cured. Cervical cancer affects women as young as 15 years of age, but a greater number of women are diagnosed within the age groups 30 to 39 or 60 to 69 years (van Schalkwyk et al., 2008).

Cervical cancer is a preventable disease by performing cervical cytology and referring women with abnormal cytology for specific follow up and treatment of precancerous lesions. In 2001, the National Department of Health in South Africa commenced a national programme for cervical cancer screening which allows three free Pap smears at health clinics for asymptomatic women aged 30 and above at a ten year interval (Maree et al., 2013). The aim of the programme was to reduce the incidence of cervical cancer to half by 75% coverage (van Schalkwyk et al., 2008). The uptake of these screening services has faced various challenges, such as lack of knowledge and awareness of cervical cancer, access and transport difficulties to screening centres, lack of motivation and anxiety about the procedures of the tests (Maree and Wright, 2011), resulting in screening uptake as low as 13% (Snyman, 2012).

Cervical cancer is caused primarily by the persistent infection of specific oncogenic forms of the Human Papilloma Virus (HPV). Transmission routes include sexual intercourse, contact through skin to skin and contact with body fluids during sexual activity. Predisposing factors are multiple sexual partners, sexually transmitted infections and early initiation of sexual activities (Maree and Wright, 2011). HPV infections are asymptomatic in nature and could resolve on their own, however if such persists, it develops to precancerous forms which could later develop into cancer within 10 to 20 years. Currently there are available vaccines for prophylaxis which can be given to girls aged 9 to 13 years (or the age range stipulated by the guidelines of the country), or before they initiate sexual activity; before exposure to the type of HPV in the vaccine (Denny and Anorlu, 2012).

2.2 TREATMENT OF CERVICAL CANCER IN LIMITED RESOURCE SETTINGS

Various guidelines exist for treating women with cervical cancer. However, the International Atomic Energy Agency (IAEA) has drawn up specific guidelines for the management of cervical cancer in limited resource centres which serve as a guide to radiation oncologists (International Atomic Energy Agency, 2012). These set guidelines are standardised, easy to understand and evidenced based and can be adapted to suit the specifics of each centre or region. For the purpose of curative treatment, patients are classified into two groups based on the FIGO staging system:

- Early stage : IA-IB1-IIA1-IB2 and IIA2 <= 4cm
- Advanced stage : IB2 and IIA2>=4cm-IIB-IIIB-IVA

The treatment of women with early stage cervical cancer includes surgery and radiotherapy, similar to those with advanced cervical cancer Stage IB2 and IIA2. Women with Stages IIB to IVA cervical cancer are not suitable for surgery and are treated with external beam radiation and brachytherapy, with or without concomitant chemotherapy; most commonly cisplatin given weekly for five cycles during external beam radiation. Curative treatment with radiotherapy, with or without chemotherapy, could be considered for women with Stage IVB cancer with para-aortic node involvement, whilst those with distant metastasis are treated with palliative intent (International Atomic Energy Agency, 2012).

The total period of treatment is a strong determinant in the outcomes of radiotherapy treatment, improvement of local control and survival and should be taken into consideration in the planning of treatment. The overall radiotherapy treatment time entails the period from the first to the last dose of radiotherapy and should not extend beyond eight weeks,

therefore, delays and interruptions in between should be prevented (International Atomic Energy Agency, 2012).

2.3 TREATMENT RELATED SIDE EFFECTS

Technology and advancement in the treatment of cervical cancer has led to the cure and survivorship of over 70% of women who are treated (Greimel et al., 2009).The quality of life of women after treatment for gynaecological cancer is vital. Unfortunately, sexual functioning has been greatly affected and has a negative influence on the quality of life in as many as 40 to 100% of women (Audette and Waterman, 2010). Also, the total experience of a diagnosis of cancer, as well as the course of treatment, has a detrimental effect on the self-image and psycho-sexual state or sense of sexuality of a woman (Falk and Dizon, 2013).

Women receiving chemotherapy and radiotherapy to the pelvis experience various side effects which include vaginal changes, fatigue, alopecia and skin changes and emotional problems which could influence their sexual behaviour and fulfilment.

Vaginal changes consist of vaginal dryness and atrophy due to depletion in the level of oestrogen production caused by ovarian failure. Ovarian failure can lead to dyspareunia and a decline in the level of sexual interest, arousal, desire, hot flushes and sleep disorders. Women also experience an increase in anxiety and a high level of fear of pain and actual experience of pain (Oskay et al., 2011). In addition, vaginal stenosis, coital bleeding, risk of fistula, shortened length of vagina and reduced flexibility also occur (Audette and Waterman, 2010). Radiotherapy causes shortening in length of the vagina and fibrosis, which has a negative impact on the sensitivity of the clitoris and genital areas during sexual activity and decreases the extent of vaginal penetration (Oskay et al., 2011). Fibrosis occurs due to inflammation and damage to the connective tissues and the mucosa of the vagina, which has a negative influence in attainment of orgasm and lubrication. This can be a late effect and can be reported as late as five years after treatment (Falk and Dizon, 2013).

Generalised fatigue, a common complication of cancer and its treatment, has a negative influence on sexual drive and desire and leads to loss of sexual energy and a reduction in desire to maintain sexuality (Oskay et al., 2011). Pubic alopecia can affect the female self-esteem, perception and sexual attractiveness (Falk and Dizon, 2013) and reduce a woman's desire to maintain her level of sexuality and attraction (Oskay et al., 2011). Additionally, emotional changes consisting of depression, anxiety, isolation, withdrawal, disturbed self-perception and image, stress, role shifting and avoidance of sexual intimacy with partner (Reese, 2011) have an impact on the sexual function as it is made up of an interconnection of psychological, emotional, cultural elements and physiologic factors (Audette and

Waterman, 2010). Also, Reese (2011) reported that studies indicate that survivors of gynaecological cancer reported less intimacy with partners in forms of kissing, caressing, sexual fantasy and that emotional distress over sexual concerns were common in cancer survivors.

2.4 SEXUAL FUNCTION

2.4.1 Sexuality

In oncology care, attention to sexual issues are inadequate with minimal regard given as it is highly underreported (Serati et al., 2009). Sexuality is a core aspect of humans and it entails sex, gender identity, sexual orientation, intimacy, reproduction and personality concept. Sexuality is a reflection of an individual's personality and lifestyle (Graziottin et al., 2009) and can be experienced and expressed in thoughts, fantasies, desires, beliefs, attitudes, values, behaviours, practices, roles and relationships. Sexuality is influenced by the interaction of biological, psychological, psychosexual, social, economic, political, cultural, ethical, religious and spiritual factors (Graziottin et al., 2009). In women, sexuality includes personal feelings about their bodies, femininity, fertility and sexual functioning which involves ability to partake in sexual activities and satisfaction of their partners (Graziottin et al., 2009). Sexual behaviour is an evident manifestation of sexuality. Also, female sexual response consists of excitement, plateau, orgasm and resolution which is interconnected in a coordinated sequence of different phases (Rosen et al, 2000) Any abnormality in the physiology and psychological cyclic response can lead to sexual dysfunction (Royo et al., 2014).

2.4.2 Sexual health

According to the World Health Organization, "Sexual health is a state of physical, emotional, mental and social well-being in relation to sexuality; it is not merely the absence of disease, dysfunction or infirmity. Sexual health requires a positive and respectful approach to sexuality and sexual relationships, as well as the possibility of having pleasurable and safe sexual experiences, free of coercion, discrimination and violence. For sexual health to be attained and maintained, the sexual rights of all persons must be respected, protected and fulfilled" (World Health Organization, 2006, pp.5).

Graziottin et al. (2009) identified three major interrelated dimensions of sexual health in women: female sexual identity, sexual function and sexual relationship interact to give women's sexual health its full meaning or its problematic profile. Sexual function is vital to women and it is important to support cancer survivors in relation to their sexuality during and after their treatment (Olsson et al., 2012). Cervical cancer usually affects younger women at a mean age of about 50 years in comparison to other forms of gynaecological cancer; these

women have a longer life expectancy after treatment. Hence, the focus shifts to ensuring a high quality of life in survivors (Ye et al., 2014) as supported by Plotti et al. (2011), who stated that the development in treatment of cervical cancer has made the five year survival rates of women with early stage cancer higher. When they are cured, their life expectancy can be as long as 25 to 30 years post treatment and they are faced with the challenges of coping with the impairment from the cancer and its treatment for long periods during their life time.

2.4.3 Classification and domains of sexual function

According to the American Psychiatric Association (2000), sexual dysfunction involves the alteration in the psycho-physiological process of the cycle of sexual response and its other characteristics. The cycle of sexual response involves the following phases:

- Desire: the inclination driven towards sexual activity.
- Excitement: physiological impulses which drive a sense of sexual pleasure.
- Orgasm: contractions of the perineal muscles and walls of the vagina and a burst of sexual excitement with ejaculation of semen in males.
- Resolution: muscular relaxation and sense of wellbeing.

Female sexual dysfunction is characterised by a group of sexual disorders which have a significant adverse effect on the quality of life and interpersonal relationships thereby causing distress. Based on the framework of the DSM-V: Diagnosis and statistical Manual of Mental Disorders of the American Psychiatric Association, there are three forms of sexual disorders involved in female sexual dysfunction. This is opposed to the old framework of the DSM-IV which classified them into more categories. (IsHak and Tobia, 2013)

These new framework categorises female sexual dysfunction into:

- Female sexual interest/ arousal disorder (formerly female hypoactive desire dysfunction and female arousal dysfunction)
- Female orgasmic disorder
- Genitopelvic pain/penetration disorder (formerly dyspareunia and vaginismus) (IsHak and Tobia, 2013).

The Female Sexual Function Index (FSFI), an instrument validated for use in the assessment of female sexual function which is widely in use, was standardised on the previous framework as described by the DSM-IV and ICD-10 International classification of diseases. (Rosen et al, 2000). Each of the different disorders in this former framework: hypoactive sexual desire disorder, sexual arousal disorders, sexual pain disorders and orgasmic disorders corresponds to the domains of sexual function in the FSFI (Rosen et al

2000). According to Rosen (2000), sexual satisfaction is a vital aspect of sexual function, although it was not classified in a separate category in the classification system. For the assessment of sexual function in this study, six domains apply:

- sexual arousal,
- sexual desire,
- lubrication,
- orgasm,
- pain and
- satisfaction.

The above domains are as stated in the female sexual function index (FSFI), an instrument designed for the assessment of female sexual function in women (Rosen et al, 2000).

In conclusion, sexual response is an interconnection of a coordinated set of events and an alteration in one domain has an influence with other disorders, resulting in an overlap in categories of classification for diagnosis (Rosen et al, 2000).

2.5 SEXUAL FUNCTION IN WOMEN WITH CERVICAL CANCER

A number of problems are associated with gynaecological cancers including the development of negative perceptions of sexual self-concept and sexual function (Bae and Park, 2015). According to Bober et al. (2013), patients undergoing treatment and cancer survivors experience similar problems related to the detrimental effects on sexual desire, arousal, orgasm and sexual pain. In addition, long term sexual dysfunction has been observed in more than 50% of patients undergoing treatment for breast, colorectal and gynaecological cancers (Bober et al., 2013). For cervical cancer patients, some problems persist for long periods after treatment. Corrêa et al. (2015), report that approximately 70% of cervical cancer survivors experience sexual dysfunction including alteration of sexual desire, vaginal dryness, soreness, bleeding, dyspareunia and vaginal atrophy after treatment. However, Sadovsky et al. (2010), when reviewing the literature found 30% to 63% of women experience sexual problems when treated for cervical cancer. In addition, Tang et al. (2010) found that whilst the frequency of sexual activity was not reduced, sexual drive and overall satisfaction was reduced, with reduction in the frequency of kissing and caressing.

Sexual function differs throughout the lifetime of a woman, varying from age group and stage of disease as well as treatment received (Oskay et al., 2011). Multiple complications could arise as a result of treatment strategies leading to sexual dysfunction caused by a complex interaction between the direct side effects from the treatment and the indirect effects of

emotional handling from the part of the women regarding withdrawal, isolation and anticipation of treatment outcome; anxiety could further aggravate sexual problems (Plotti et al., 2011). According to Greimel et al. (2009), radiotherapy appears to lower sexual activity rate in women, whilst Vaz et al. (2011) report radiotherapy causes a decreased level of sexual interest. In addition, Rodrigues et al. (2012) reports reduced levels of orgasm and altered sexual arousal owing to impaired blood flow innervations and premature menopause which is caused by radiotherapy.

Not only women's sexual function is affected by cervical cancer and its treatment, as Reese (2011) suggests that cancer treatments affect the sexual function of partners as well as the cancer survivors. Sterba et al. (2011), in a study of sixty eight (68) gynaecological cancer patients and their partners, found 74% of the patients' partners acknowledged vagina dryness after cancer treatment, whilst 41% of patients reported the reduction in sexual function. According to Stafford and Judd (2010), the spouse plays a significant role in judging and evaluating the aspects vital to the sexual relationship of the couple. Nanton et al. (2010) observed that sexual dysfunction of men with prostate cancer was minimised by their spouses, thus implying the alleviation of the detrimental effect of cancer on sexual function can be lessened by the spouse. Tang et al. (2010) reports that prior sexual dysfunction before cancer treatment may engender greater difficulty in effectively handling cancer related sexual difficulties.

Cancer treatment does not only have detrimental effects on sexual relationships, as some couples report an increased sexual intimacy despite the harmful effects of cancer treatments (Flynn et al., 2011). Lindau et al. (2011) reports increased noncoital physical closeness, solidarity in relationship and emotional support and appreciation following treatment. In addition, some particular strategies, such as effective communication, help couples improve their ability to cope with the illness and experience better quality of intimacy (Badr et al., 2010) which depends on the significance of the relationship role in coping with cancer treatment (Reese, 2011).

2.6 SUMMARY

In this chapter, the literature relating to cancer and cervical cancer, cervical cancer treatment, the side effects of cervical cancer and how it influences sexual function was described. The next chapter presents the research design and methods used in the study.

CHAPTER 3

RESEARCH DESIGN AND METHODS

Chapter 2 described the literature pertaining to the concept of sexual function in relation to treatment of cervical cancer. This chapter gives an overview of the research design and methods of the study as well as the ethical considerations applied in the study.

3.1 RESEARCH DESIGN

According to Burns and Grove (2012), the research design is a step-wise plan which gives direction to a study based on its set objectives. The research design ensures that pre-identified and adequate control measures are put in place as preventive procedures against factors that can influence the research findings. It also guides the appropriate strategy for implementation of the study in the choice of the research population, method of gathering data and how generated data will be analysed (Burns and Grove, 2012). The study used a cross sectional design. A cross sectional design aims to investigate various sets of respondents at different levels or grades thereby giving an explanation into the variations based on specific aspects under study in the groups. Cross sectional studies obtain information at the same time within the same given population once (Burns and Grove, 2012).

3.2 RESEARCH SETTING

The research setting is the particular site where the study will be carried out and data collected (Burns and Grove, 2012). The study was conducted in the radiation oncology department of an academic hospital in Johannesburg.

The hospital has approximately 4000 staff members and 1088 beds serving individuals from the Gauteng Province, other provinces and from neighbouring countries. Services offered range from secondary, tertiary, referral and specialised care on an inpatient as well as outpatient basis. The cost for these services is carried by a National Tertiary Service Grant and funds allocated to the province. In addition, the hospital serves as the main teaching hospital for the Faculty of Health Sciences at the University of the Witwatersrand, providing a platform for learning and services for undergraduate and postgraduate students. The hospital has a large oncology section with both medical and radiation departments. This section runs various clinics serving a large number of patients and wards for admission. The radiation unit is well equipped with state of the art machinery and equipment also serving a

huge number of patients. The staffs are well trained, skilled and competent in the care of oncology patients and have a high record in the treatment of all forms of cancers, including cervical cancer. They offer care to a large number of women with cervical cancer every year (University of the Witwatersrand, 2015) most commonly on an out-patient basis. Women treated for cervical cancer return to the department regularly as they are assessed three monthly for two years, six monthly for another two years and thereafter once a year after the completion of their treatment.

3.3 POPULATION AND SAMPLING

The research population is the overall group of individuals who conform and meet up to specific stipulated yardsticks laid out as inclusions in the study. The population includes the set of people to whom universality of the study will be applicable (Burns and Grove, 2012). The study population was all women of 18 years and older, who had completed curative treatment for cervical cancer, thus being diagnosed with Stage IIB- IVA cervical cancer. The target population was all women who received the aforementioned treatment and came for a follow up assessment three, sixth and twelfth months after treatment. These three study groups were selected as women are scheduled in this radiation clinic for follow up care in their third, sixth and twelfth months after their treatment is completed.

Convenience sampling selected the sample. Convenience sampling is a technique of selecting individuals who are readily available and found at the right place and right time. Only available individuals are recruited till the desired number is reached (Burns and Grove, 2012). This sampling method was appropriate for the study as it allowed the researcher to include women returning to the clinic for a scheduled follow up assessment.

Based on statistical consultation, the sample size was calculated at a desired level of significance with confidence interval 95%, a z value of 1.96 and a marginal error (D) of 0.5 standard deviation (S) of outcome variables (from a previous validation study) of 3.08 (Meston, 2003) using the formula below:

Sample size $N=\frac{(Z_{\alpha/2}S)^2}{D}$

The derived sample size gives 147 respondents with a number of 49 in each group in the third, sixth and twelfth months of follow up care.

Women who were waiting for their follow up assessment in the radiation oncology department were recruited and this recruitment continued until the sample size was reached (Burns and Grove, 2012).

3.4 DATA COLLECTION AND INSTRUMENT

Data are information which is gathered systematically in a study. Data collection is the process whereby data are collated in an organised method that gives a definition to the specific variables being studied and applicable to the set objectives and purpose of the study (Basavanthappa, 2010). Data were collected by means of structured interviews using the Female Sexual Function Index (FSFI) (Appendix D) as the data gathering instrument. A structured interview is an orderly, systematic process of data collection using a list of questions which have been prepared prior to the interview as a guide. Using and interview guide helps to ensure consistency by asking the respondents the same set of standard questions in the same order (Burns and Grove, 2012). Using structured interviews allowed the researcher to ensure that questions and concepts were clearly understood as respondents could ask questions for clarification thus enhancing coherence (Burns and Grove, 2012). It also allowed the researcher to not exclude respondents based on their literacy level.

The Female Sexual Function Index (FSFI) served as the interview guide, a tool used for the collection and documentation of information generated from a list of clearly stated questions and instructions in line with the objectives of the study (Burns and Grove, 2012). The interview was conducted in a comfortable private room and women who met the inclusion criteria, waiting for follow up care, were approached. A 100% response rate was achieved as all the women who were approached agreed to participate in the study voluntarily. The data were collected from 13th July to 25th August 2015.

The FSFI is a validated self-administered instrument used to assess female sexual function. However, in this study, it was used as a researcher administered questionnaire because being in the English language, respondents might not have been able to read and speak more than Basic English. The Registered Nurses practicing in the radiation oncology unit volunteered to assist the researcher with language issues should it arise however, such assistance was not needed. The FSFI is in the open domain for use and permission is not required for its use in this study.

The FSFI was developed by Rosen et al. (2000) in a study conducted on assessment of female sexual functioning and is one of the most widely used measures of female sexual function. The validation study reported excellent internal consistency reliability coefficients for the total FSFI score and subscales with Cronbach alpha value range of 0.82 to 0.96 (Rosen et al, 2000)

In a study by Baser et al. (2012) to evaluate the reliability and construct validity of the instrument in assessing sexual function in female cancer survivors. The Cronbach alpha value for the FSFI total score was 0.94 while in the subscales it ranged from 0.85 (for Satisfaction) 0.94 for Lubrication)

The instrument consists of nineteen (19) items which assesses sexual activity during the previous four (4) weeks. It measures sexual function in six (6) domains; sexual desire (two items), arousal (four items), lubrication (four items), orgasm (three items), satisfaction (three items) and pain (three items). Each domain has a score on a scale of 0 to 6 represented on an ordinal Likert-type response format, with a score of 0 representing no sexual activity and a score of 6 indicating the highest level of functioning (Baser et al. 2012)

The score from each domain is derived by the addition of the score of each item in the domain and multiplying by its corresponding factor. The total sexual function score is obtained by adding up the scores of all domains. The total score ranges from 2 and 36, with a higher score indicating better sexual function (Rosen et al, 2000).

According to Royo et al. (2014), the cut off points for each domain of 3.6 and below represents dysfunction, while the FSFI full score of 26.55 and below represents dysfunction in the total sexual function (Wiegel et al., 2005). The data collection was planned as follows:

- The researcher was present in the clinic with copies of the data collection instrument, consent forms and information sheets on the scheduled days of the week dedicated to follow up appointments in the gynaecology clinic.
- The researcher approached women while they awaited their turn for follow-up. It was ensured they did not lose their turn in the queue whilst the structured interviews were being conducted.
- Written informed consent was obtained and the contents of the information sheet were duly explained to the women.
- Arrangements were made with the head of the unit as well as the Registered Nurses within the clinic for counselling. A total number of eight women were referred for counselling support during data collection.
- The data collection period lasted for six weeks and ended when the entire sample size was reached.

3.5 DATA ANALYSIS

Data analysis is the structuring, computation and interpretation of data. In relation to data analysis is the structuring, computation and interpretation of data relating to the research problem identified (Burns and Grove, 2012). Data collected were captured and computed on a statistical spreadsheet in various categories and analysed using the statistical programme SPSS 22 utilising descriptive statistics of mean, mode and standard deviation to analyse the variables. The Kruskal Wallis test, a nonparametric test used to determine the statistical significance between two or more groups, was used to determine if there is a significance difference between the variables. This test is used when each condition being assessed is carried out by a different group of participants and was appropriate for the study as the data involved are not normally distributed (Hole, 2011).

3.6 ETHICAL CONSIDERATIONS

Ethical considerations involve the actions put in place to ensure research is carried out without posing any threat or harm to the respondents involved**.** According to Burns and Grove (2012), ethical consideration entails ensuring appropriate informed consent is obtained from participants, presenting a research proposal submitted for institutional review and preserving the rights and shielding participants from harm during their involvement in a research study. Hence, the study must be carried out systematically and competently to uphold human rights, respect and dignity. Appropriate reference must be given to various contributors involved in the study with outcomes of the study being disseminated appropriately. Principles of confidentiality, informed consent, proper data handling, right to withdraw from study, adequate information on study and potential risks or benefit must be ensured during the research process (Brink et al. 2012).

During the research process, the following steps were taken:

- The research proposal for this study was peer reviewed by the faculty of the Department of Nursing Education and Assessor's Group of the School of Therapeutic Sciences. In addition, official approval was obtained from the Postgraduate Research Committee of the Faculty of Health Sciences.
- Ethical clearance was obtained from the Human Research Ethical Committee of the University of the Witwatersrand; ethical clearance number M150432 (Appendix F).
- Permission to conduct the study was obtained from the Director of Nursing and Chief Executive Officer of the hospital. The Unit Manager (Nursing) and clinical head of the radiation oncology department also approved and supported the study.

- Informed written, voluntary, consent was obtained from each of the participants. Information was given on the purpose, objectives of the study and the respondent's right of withdrawal, anonymity and confidentiality were stated.
- Due to the sensitivity of the questions, the data were collected in a private room with only the respondent and researcher present. In addition, arrangements were made with the nurse in charge of counselling in the radiation oncology department to counsel respondents should they become emotionally distressed.
- The researcher ensured the maintenance of anonymity, confidentiality of information and the privacy of respondents. Structured interviews were carried out in a private room, away from the waiting area, using the data collection instrument as a guide. Respondents were approached individually, after detailed explanation on the concept of the study, informed consent was obtained. Also each question on the questionnaire was asked by the researcher and properly explained to respondents. The researcher ticked the selected option on the questionnaire used as a guide. Completed questionnaires were placed in large brown envelopes without the names of respondents on them and therefore could not be traced to each respondent. Good communication skills were used during the interview sessions and participants were assured of counselling support should any emotional discomfort arise.
- Confidentiality and anonymity was maintained throughout the study and data gathered in the study was analysed appropriately. The data gathering tool was coded and numbered sequentially with numbers without the respondents' names and collated in an envelope thereby making it impossible to link the respondents to the numbered completed questionnaires.
- Data were collected until the sample was realised. The data collected were only accessible to the researcher and supervisor.

3.7 SUMMARY

This chapter described the research design, methods, data collection instrument, process, analysis and ethical consideration in the study. The discussion of findings from the study will be presented in the next chapter.

CHAPTER 4

RESULTS AND DISCUSSION

Chapter 3 presented the research design and methods used in this study. This chapter focuses on the findings and discussion. In this study, data were collected from a total of 147 women by means of structured interviews using the Female Sexual Function Index (FSFI) as the data gathering instrument. The sexual function of these women was explored in three groups: Group 1 (n=49) represents women three months after completing treatment, Group 2 shows (n=49) those six months after treatment and Group 3 represents women (n=49) twelve months after treatment. Inferences were drawn based on statistical analysis and evidence from gathered data and reported based on the six domains of sexual function and the total score of the FSFI.

4.1 DEMOGRAPHIC PROFILE OF THE RESPONDENTS

The ages of the sample (n=147) ranged from 30 to 73, with the largest proportion (42.9%; n=63) being between the ages 40 to 49. The mean age was 45.7 $\pm$ 9.2 years and median age was 44. The majority of the sample (52.4%; n=77) had a high school education, whilst 39% (n=58) were functionally illiterate. Only 12 women (8.2%) had tertiary education. More than half of the sample (61.9%; n=91) indicated they had received sexual counselling before treatment. The greatest percentage of the sample (49.7%; n=73) were employed, whilst 44.2% (n=65) were unemployed and the remaining 6.1% (n=9) were retired. Most were single (62.5%; n=92). The majority (60.5%; n=89) were treated with external beam radiation (EBR) and brachytherapy only, while 39.5% (n=58) received a combination of EBR, brachytherapy and chemotherapy. The general information of the three groups is presented in Table 4.1.

Table 4.1 Demographic profile of the respondents (n=147)

Variable	Group 1		Group 2		Group 3		Total	
Age	**n**	**%**	**n**	**%**	n	**%**	**n**	**%**
30-39	17	34.7	10	20.4	15	30.6	42	28.6
40-49	23	46.9	18	35.7	22	44.9	63	42.9
50-59	6	12.2	14	28.6	10	20.4	30	20.4
60-69	2	4.1	5	10.2	2	4.1	9	6.1
70-79	1	2.0	2	4.1	0	0	3	2.0
Educational level								
Primary school	16	32.7	26	53.1	16	32.7	58	39.5
Grades 8-10	6	12.2	7	14.3	8	16.3	21	14.3
Grade 11-12	22	44.9	12	24.5	22	44.9	56	38.1
Tertiary education	5	10.2	4	8.2	3	6.1	12	8.2
Employment status								
Unemployed	21	42.9	24	49	20	40.8	65	44.2
Employed	27	55.1	19	38.8	27	55.1	73	49.7
Retired	1	2	6	12.2	2	4.1	9	6.1
Marital status								
Single	30	61.2	26	53.1	36	73.5	92	62.6
Married	18	36.7	20	40.8	12	24.5	50	34.0
Divorced	1	2.0	3	6.1	1	2.0	5	3.4
Sexual counselling received before treatment								
Yes	34	69.4	25	51	32	65.3	91	61.9
No	15	30.6	24	49	17	34.7	56	38.1
Type of treatment received								
External beam radiation and brachytherapy	32	65.3	28	57.1	29	59.2	89	60.5
External beam radiation, brachytherapy and chemotherapy	17	34.7	21	42.9	20	40.8	58	39.5

4.3 THE DOMAINS OF SEXUAL FUNCTION

The majority of the sample (80.3%; n= 118) reported being sexually active in the preceding four weeks prior to data collection. There was an increase in sexual activity as time progressed from three months (79.6%; n=39) to six months (83.7%; n= 41), while there was a decline in those involved in sexual activity in the group of twelve months (77.6%; n=38) (Figure 4.1). A Kruskal Wallis test found no statistically significant difference in the involvement in sexual activity as time progressed in the three groups.

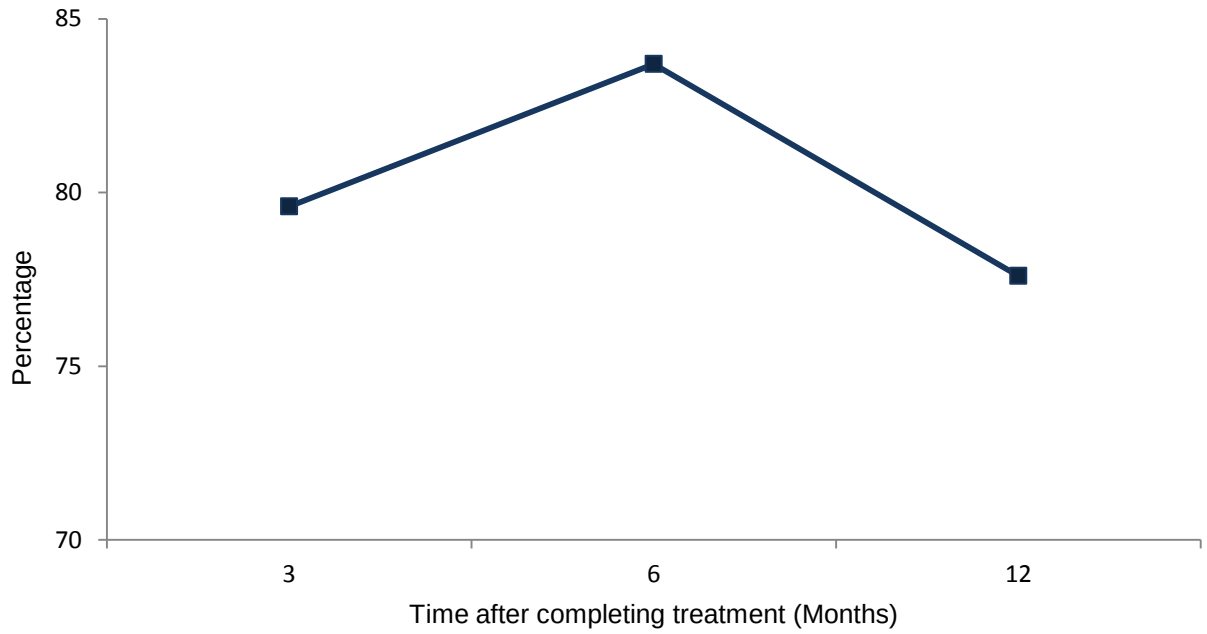

Figure 4.1.Sexual activity according to the three groups

When exploring the six domains of sexual function in the total sample: desire, arousal, lubrication, orgasm, satisfaction and pain, it was found that satisfaction had the highest mean score of 3.1 (SD ± 1.5), whilst arousal had the lowest mean score of 2.2 (SD ± 1.4). When applying the 3.6 cut off point (Royo et al., 2014) all the domains indicated dysfunction. The mean score of the full FSFI score of the entire sample (n=147) was 15.1 (SD ± 7.4) indicating a dysfunction in the whole sample when applying the cut off score of 26.55 for the full score as described by Wiegel et al. (2005). The details of the domains and their means scores are presented in Table 4.2 and Figure 4.2.

Table 4.2 Average scores for sexual function (n=147)

Domain	Mean ± SD
Desire	2.5 ± 1.0*
Arousal	2.2 ± 1.4*
Lubrication	2.4 ± 1.5*
Orgasm	2.5 ± 1.5*
Satisfaction	3.1 ± 1.5*
Pain	2.4 ± 1.7*
FSFI full scale score	15.1 ± 7.4*

*indicates sexual dysfunction

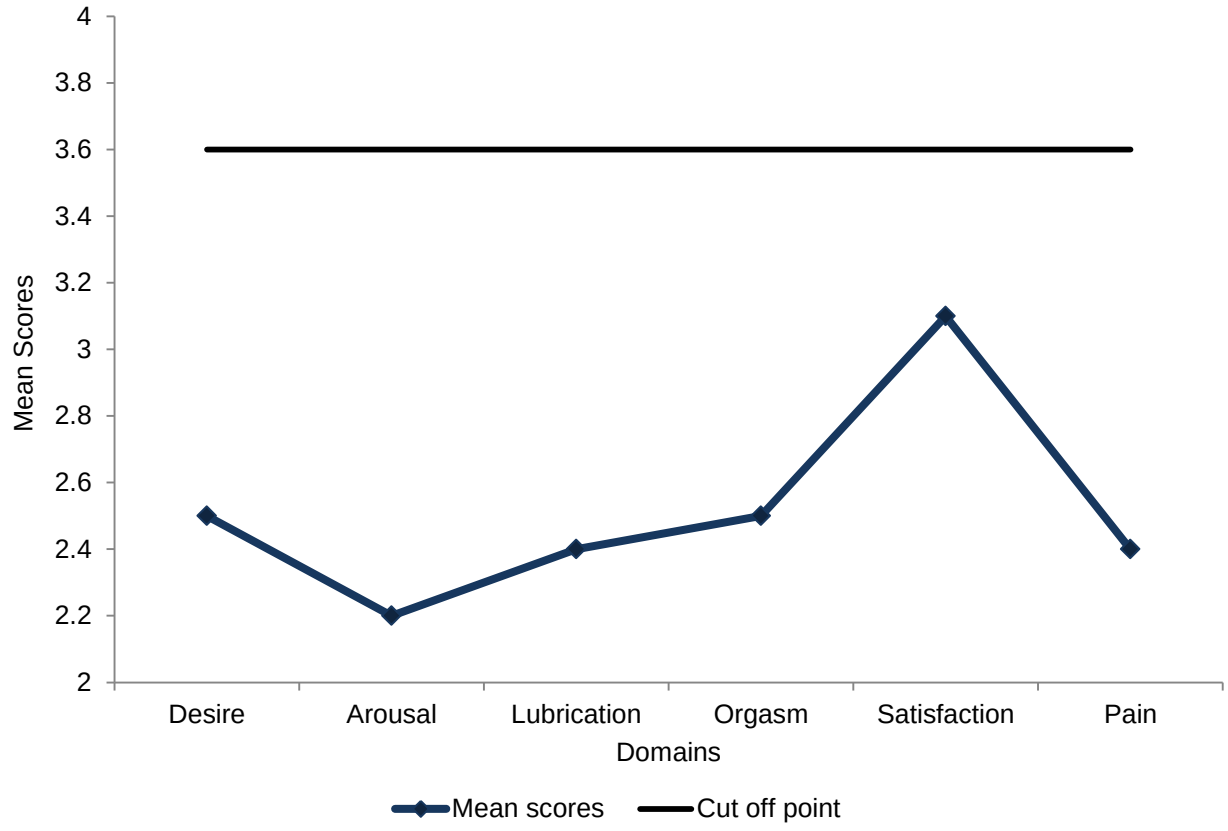

Fig. 4.2. Average scores for domains of sexual function

4.4 DOMAINS OF SEXUAL FUNCTION ACCORDING TO THE THREE GROUPS

When comparing the domains of the groups, Group 2 had the highest mean scores in the desire and arousal domain, 2.6 ± 1.0 and 2.3 ± 1.3 respectively. In the lubrication and orgasm domains, both Groups 2 and 3 had same mean scores of 2.4 (SD±1.5) and 2.4 (SD± 1.6) respectively, which were higher than that of Group 1. Group 2 had the highest score of 3.4 ± 1.5 in the domain of satisfaction, whilst Group 3 scored the highest mean in the pain domain; 2.8 ± 3.0 (Figure 4.3).

On the full FSFI score, Groups 2 and 3 had same mean scores of 15.7 ± 7.1 and 15.7 ± 8.0 respectively. Although these scores were the highest scores within the groups, they are all below the set cut off point of reference, hence indicating sexual dysfunction in each of the domains within all three groups. Across the three groups, Group 1 had the lowest scores in all the domains as well as in the full FSFI score.

When analysing the relationships between the variables, the Kruskal Wallis test was used with a p-value representing statistical significant difference at values ≤ 0.05. Statistical significant differences existed between pain and the time after completion of treatment (three, six and twelve months) χ^2 (2) = 6.85, p=0.033, also between satisfaction and the type of treatment received: Kruskal Wallis χ^2 (2) = 4.02, p=0.045. There was no significant difference between age, educational level and employment status. The mean scores in each domain in the three groups are presented in Table 4.3.

Table 4.3 Sexual function according to the domains in each group (n=49)

Domains	Mean scores ± SD			P value	
	Group 1	Group 2	Group 3	Time after completing treatment	Treatment received
Desire	2.4 ± 1.0	2.6 ± 1.0	2.5 ± 1.0	0.45	0.26
Arousal	2.1 ± 1.4	2.3 ± 1.3	2.2 ± 1.4	0.48	0.62
Lubrication	2.2 ± 1.5	2.4 ± 1.5	2.4 ± 1.6	0.61	0.45
Orgasm	2.3 ± 1.6	2.5 ± 1.4	2.5 ± 1.7	0.56	0.43
Satisfaction	2.9 ± 1.6	3.4 ± 1.5	3.2 ± 1.4	0.22	0.045*
Pain	2.0 ± 1.5	2.5 ± 1.5	2.8 ± 2.0	0.033*	0.81
Full FSFI score	13.9 ± 7.1	15.7 ± 7.1	15.7 ± 8.0	0.10	0.31

*significant difference; $p \leq 0.05$

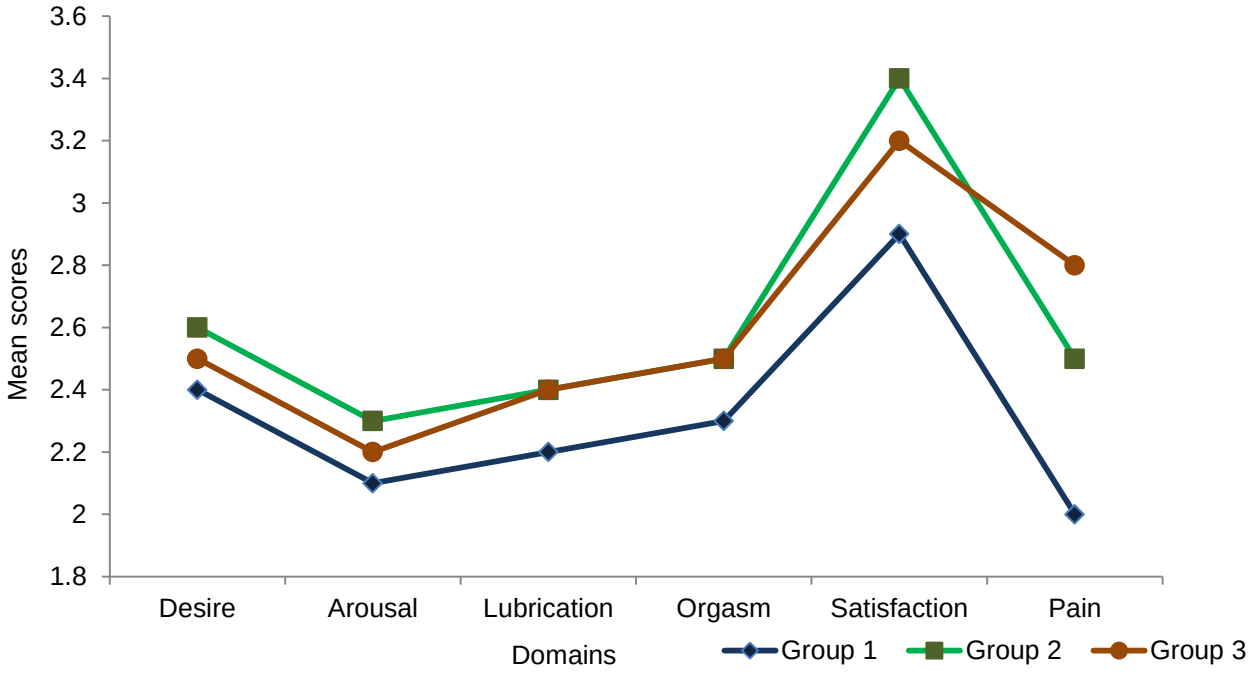

Fig 4.3 Sexual function according to the domains in each group

4.5 COMPARISON BETWEEN SEXUAL DYSFUNCTION AND GOOD SEXUAL FUNCTION

When exploring the six domains of sexual function, desire, arousal, lubrication, orgasm, satisfaction and pain, as well as the full FSFI score in the total sample, all the domains had a higher percentage of women with sexual dysfunction compared to those with a good level of sexual function. When applying the set cut off point (Royo et al., 2014) across the total sample (n=147), the domain desire reported the highest percentage women with dysfunction (93.9%; n=138), followed by arousal (91.8%; n=135), lubrication (87.1%; n=128), orgasm (85.0%; n=125) and pain (81.0%; n=119). The domain satisfaction had the lowest percentage of dysfunction (67.3%; n=99) (Figure 4.4 and 4.5). As reflected by the full FSFI score, almost all the women had sexual dysfunction (94.6%; n=139).

The proportion of women in the categories of sexual dysfunction and good sexual function is described according to each group in Table 4.4

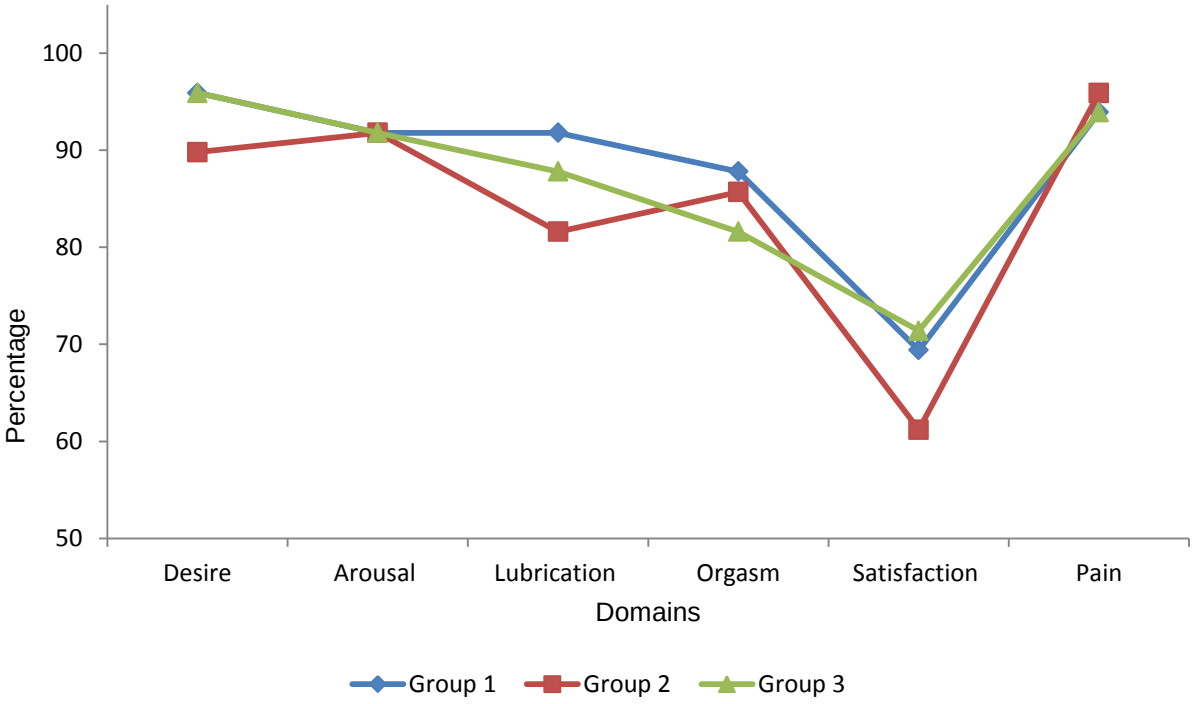

Fig 4.4 Sexual dysfunction in the domains according to the three groups

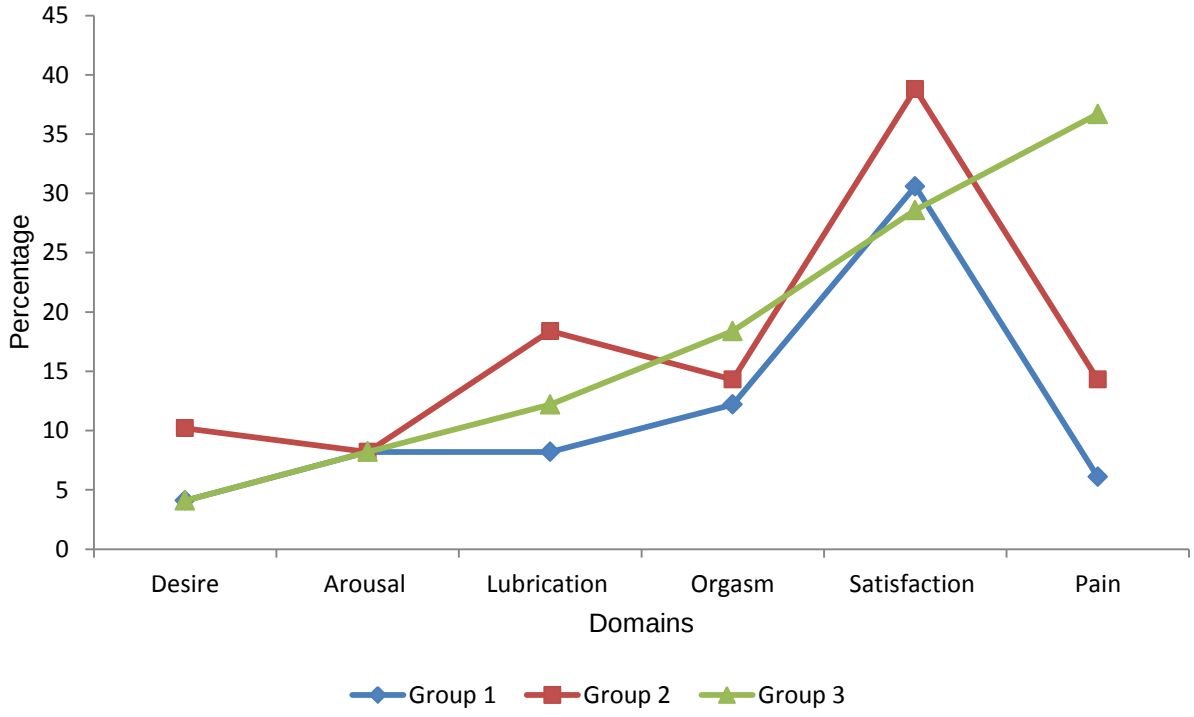

Fig 4.5 Good sexual function in the domains according to the three groups

Table 4.4 Comparison between sexual dysfunction and good sexual function (n=49)

Sexual Function		Group 1		Group 2		Group 3		Total	
Domains	**Category**	n	%	n	%	n	%	n	%
Desire	Sexual dysfunction*	47	95.9	44	89.8	47	95.9	138	93.9
	Good sexual function**	2	4.1	5	10.2	2	4.1	9	6.1
Arousal	Sexual dysfunction	45	91.8	45	91.8	45	91.8	135	91.8
	Good sexual function	4	8.2	4	8.2	4	8.2	12	8.2
Lubrication	Sexual dysfunction	45	91.8	40	81.6	43	87.8	128	87.1
	Good sexual function	4	8.2	9	18.4	6	12.2	19	12.9
Orgasm	Sexual dysfunction	43	87.8	42	85.7	40	81.6	125	85.0
	Good sexual function	6	12.2	7	14.3	9	18.4	22	15.0
Satisfaction	Sexual dysfunction	34	69.4	30	61.2	35	71.4	99	67.3
	Good sexual function	15	30.6	19	38.8	14	28.6	48	32.7
Pain	Sexual dysfunction	46	93.9	42	85.7	31	63.3	119	81.0
	Good sexual function	3	6.1	7	14.3	18	36.7	28	19.0
Full FSFI score	Sexual dysfunction	46	93.9	47	95.9	46	93.9	139	94.6
	Good sexual function	3	6.1	2	4.1	3	6.1	8	5.4

Scores *0-3.6 indicates sexual dysfunction while **3.7-6.0 indicates good sexual function

There was a wide margin between women with scores below the set cut off and those with scores above in all three groups in each domain. The same trend was found in the FSFSI full scores of all groups when applying the cut off score. (Figure 4.6)

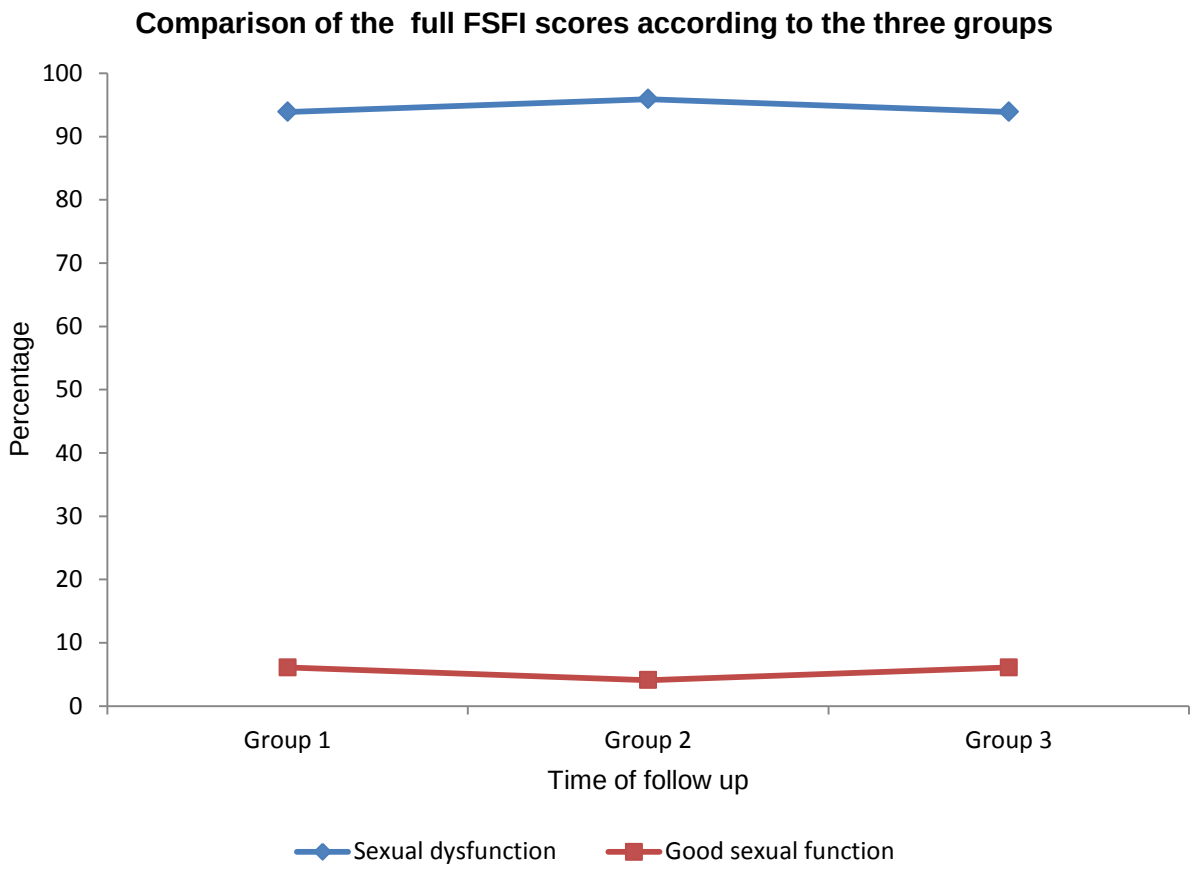

Figure 4.6 Full FSFI scores according to the three groups

Statistically significant difference was determined between the time after treatment and the domains pain, satisfaction and type of treatment received. No statistical significant differences were found between age, sexual counselling received, educational level and employment status. Although no statistically significant difference existed between sexual function and age, educational level and type of treatment received, half of the women who had good sexual function (n=8) were younger than 40 as 50% (n=4) were between the age group of 30 to 39. In addition, 50% (n=4) had sexual education before treatment while an equal number did not, a greater percentage (62.5%; n=5), had an educational level of grade 11 to 12 and almost all of them were treated with external beam radiation and brachytherapy without concurrent chemotherapy (87.5%; n=7).

4.6 DISCUSSION

The study provided evidence that the majority of the women (80.3%) were sexually active during the four weeks prior to the collection of the data. This high percentage is supported by a study conducted by Tangjitgamol et al. (2007) among Thai women in which 93.4% (n=105) resumed sexual activity after treatment. In contrast, some studies report lower numbers. For instance, Greimel et al. (2009) in a study conducted in Austria, reported that 56.7% of the women resumed sexual activity after they completed treatment for cervical cancer, whilst Corrêa et al. (2015), in a study conducted in Brazil, found 40.5% of cervical cancer survivors resumed sexual activities.

Additionally, Jensen et al. (2003), in a study conducted in Denmark, reported that, despite changes in the vagina after radiotherapy, 63% of women who were sexually active prior to the commencement of treatment continued sexual activity after treatment. Whether the same trend would apply to the current study is unknown as sexual activity prior to treatment was not explored. However, Jensen et al. (2003) found as time progressed, the proportion of those who were not sexually active declined by 25% after three months to 11% after 24 months (Grimm et al., 2015). The same trend was not observed in the current study as there was a slight increase in sexual activity from month three to month six and a slight decline at twelve months. It might have been possible that more women in the 12 months group were not sexually active before the commencement of treatment compared to the other groups. However, a longitudinal study should be completed before definite conclusions can be made.

Findings from this study further provided evidence that pain experienced during sexual activity after treatment persisted in most of the women (81%) even as time progressed, with the level of pain highest three months after treatment with little improvement as the time progressed (Table 4.4, Fig 4.6). This finding is supported by Jensen et al. (2003), who found

that pain persisted in 55% of women for up to two years after treatment. Similarly, Song et al. (2012), in a study conducted in Korea, reported a high prevalence of pain persisting over time which, according to Bergmark et al. (1999), could be superficial and deep pain. In addition, Tangjitgamol et al. (2007) reported that pain increased in 37% of women after treatment.

Bergmark et al. (1999) and Song et al. (2012) ascribe the persistence of pain to the changes in the vagina resulting from reduced elasticity of its walls, vaginal bleeding, shortened length and reduction in lubrication. Ljuca and Marošević (2011), in a study conducted in Bosnia, found more than 95% of women no longer experienced pain and irritation in the vagina twelve months after chemo-radiotherapy. However, despite the cessation of these problems, the sexual function of the women in their study did not improve due to reasons such as fear of cancer reoccurring after intercourse and partners fear of “secondary radiations.”

Findings that the most affected domains were arousal and desire, while satisfaction was the least affected domain in sexual function, are not unique (Table 4.4, Fig 4.6). Reis et al. (2010) and Corrêa et al. (2015) also reported lowest mean score in the desire domain. In addition, Rodrigues et al. (2012), in a study conducted in Portugal involving women treated with radiotherapy to the pelvis, also recorded the lowest scores in the arousal domain and the highest score in the satisfaction domain had the highest mean score. Bergmark et al. (1999) reported that sexual interest was reduced in women who had cervical cancer compared to a randomly selected matching sample of healthy women due to the insufficiency of sexual hormones caused by the treatment, trauma to the vagina caused by radiotherapy and the emotional distress resulting in melancholy which leads to a diminution in sexual excitement. Although sexual desire was one of the most affected domains in the current study, which included women up to 12 months after treatment, (Jensen et al., 2003) also found low or no sexual interest in women within a two year period after radiotherapy for cervical cancer, which Vaz et al. (2011) attributes to the dyspareunia women experience.

When considering the domain satisfaction (mean 3.1 in the current study; Table 4.2, Fig 4.2), it was found other studies also reported the same trend. Findings by Corrêa et al. (2015) showed the highest mean score in this domain (4.34), while Pilger et al. (2012) reported a score of 3.71. Corrêa et al. (2015) substantiate these findings by stating women have a tendency to adapt to sexual relations as they wish to please their partners even if they have little or no desire, while Rodrigues et al. (2012) further illustrated that women adjust to having sexual intercourse so as to satisfy partners.

Furthermore, this study provided evidence that age, education and pre-treatment counselling did not have any influence on sexual function. This is in sharp contrast to findings of various

studies. For instance, Rodrigues et al. (2012) reported that sexual dysfunction was more prominent in older women, whilst Tsai et al. (2011), in a study conducted in Taiwan, found an increase of 16% in the risk of sexual dysfunction with each year rise in age. Supporting this finding, Bae and Park (2015), in a study conducted in Korea, reported that younger age and higher levels of education are related to higher sexual function. The discrepancy between the findings of the current study and the other studies could possibly be the result of the proportion of women older than 50 included in the studies. The current study had a sample proportion of 28.5% of women above 50 years of age, whilst this age bracket (>50) represented a sample proportion of 46.7% in the study of Bae and Park (2015) and approximately 70% in the study of Rodrigues et al. (2012). Furthermore, Tangjitgamol et al. (2007) state the sexual needs of younger women are higher and with increasing age in women, they are more susceptible to sexual issues which are age related. Therefore it was interesting to find that the majority of the few women in this study who had a good sexual function were younger, between the ages of 30 and 39.

With regards to educational level, both Corrêa et al. (2015) and Tsai et al. (2011) reported that a higher educational level had a positive influence on sexual function. Possible reasons are educated women might have access to resources, information and an expansive range of knowledge in dealing with the disease. This could assist them in their recovery process, coping strategies and adaptation to the changes caused by their cancer and its treatment resulting in improved sexual relationships and function. The current study determined four levels of education with most of the women (53.8%) with an educational level ≤ grade 10, whilst two levels of education (high and low) were used in the previously mentioned studies which could also relate to the differences in the findings.

Considering the findings of the studies conducted by Lindau et al. (2011) and Tsai et al. (2011) it was interesting to note that pre-treatment counselling did not have any influence on sexual function in women in the current study. Lindau et al. (2011) and Tsai et al. (2011) indicated that lack of sexual education and counselling are risk factors for sexual dysfunction, whilst Corrêa et al. (2015) reported that psychotherapy and psycho social counselling and discussions on sexual concerns help improve sexual function.

Finally, the study provided evidence that the majority of the women (94.6%) experienced sexual dysfunction which persisted over time (Table 4.4, Fig 4.6). This percentage is higher than the 86.5% reported by Liu et al. (2015) and the 80% reported by Corrêa et al. (2015). Jensen et al. (2003) found a similar trend over a two year period and reported that sexual dysfunction was persistent throughout the period. According to Bergmark et al. (1999) and Jensen et al. (2003), ovarian failure caused by chemotherapy and radiotherapy, fatigue, vaginal changes, as well as emotional distress and fear of a recurrence of the cancer may

be associated to the high prevalence of sexual dysfunction which remains persistent long after treatment.

CHAPTER 5

JUSTIFICATION, LIMITATIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

In Chapter 4, the findings of the study were presented and discussed in detail. This chapter focuses on the justification, limitations and recommendations. The study will also be concluded.

5.2 JUSTIFICATION OF THE STUDY

The study will be justified in terms of its purpose and aims. The purpose of the study was to explore the sexual functioning of women after being treated for cervical cancer at an academic hospital in Johannesburg, South Africa. The study aimed at exploring the sexual functioning of women treated for cervical cancer in the third, sixth and twelfth months after completing the treatment.

Chapter 3 described the research design and methods in detail. Chapter 4 presented the findings and an in depth discussion of the findings. The sexual function of women at three, six and twelve months after treatment were presented in terms of the domains of sexual function, sexual dysfunction and good sexual function. Comparisons were also made. It can therefore be stated that this study is justified as the purpose and aims were met.

5.3 LIMITATIONS OF STUDY

Using a cross sectional design disallowed investigating changes in the same respondents over time. A longitudinal design could result in more accurate findings regarding the sexual function of women over time. Additionally, the presence of sexual dysfunction in partners was not investigated or ruled out which could also have influenced the findings.

Sample size outcome variable from a previous validation study by Meston (2003) was used in the calculation of the sample size in this study as opposed to a more recent validation study by Baser et al (2012). The study by Meston (2003) was used because its study population were women who already had identified sexual dysfunctions while the latter study was in female cancer survivors without established sexual dysfunction.

Although some women indicated being single, this did not rule out the presence of a sexual partner. This is due to the fact that marital status does not rule out the presence or absence

of sexual partners. Also, sexually inactive women were not excluded in the study and they only gave specific scores in the domain of satisfaction while their sexual function was calculated based on the minimum scores for each domain. Reasons for their sexual inactivity were not explored as it was out of the scope of this study.

5.4 RECOMMENDATIONS FOR CLINICAL PRACTICE

Although sexual function after treatment was not influenced by sexual counselling before treatment, nurses practicing in cancer care settings should not become discouraged and discontinue this standard practice. It might be helpful to assess the patient's needs regarding sexual issues prior to treatment, at regular intervals after treatment and focus on these needs during the counselling sessions. Different models of sexual care can also be considered. In addition, a longitudinal study could be conducted which would allow assessing sexual function over time and guide nursing interventions to improve sexual function of women.

5.5 CONCLUSION

The study provided evidence that the majority of women treated for cervical cancer at an academic hospital in the Gauteng Province live with long lasting sexual dysfunction affecting all the domains of their sexual functioning. Although sexual dysfunction reached the highest level in the third month after treatment, there was little improvement over time. Age, educational level and sexual counselling before treatment did not influence sexual function.

REFERENCES

ABBOTT-ANDERSON, K. & KWEKKEBOOM, K. L. 2012. A systematic review of sexual concerns reported by gynecological cancer survivors. *Gynecologic oncology,* 124**,** 477-489.

AMERICAN PSYCHIATRIC ASSOCIATION 2000. *Diagnostic and statistical manual-text revision (DSM-IV-TRim, 2000)*, American Psychiatric Association.

AUDETTE, C. & WATERMAN, J. 2010. The sexual health of women after gynecologic malignancy. *Journal of Midwifery & Women's Health,* 55**,** 357-362.

BADR, H., CARMACK, C. L., KASHY, D. A., CRISTOFANILLI, M. & REVENSON, T. A. 2010. Dyadic coping in metastatic breast cancer. *Health Psychology,* 29**,** 169.

BAE, H. & PARK, H. 2015. Sexual function, depression, and quality of life in patients with cervical cancer. *Supportive Care in Cancer***,** 1-7.

BASAVANTHAPPA, B. 2010. Essential of Nursing Research. Jaypee.

BASER, R. E., LI, Y. & CARTER, J. 2012. Psychometric validation of the Female Sexual Function Index (FSFI) in cancer survivors. *Cancer,* 118**,** 4606-4618.

BERGMARK, K., ÅVALL-LUNDQVIST, E., DICKMAN, P. W., HENNINGSOHN, L. & STEINECK, G. 1999. Vaginal changes and sexuality in women with a history of cervical cancer. *New England Journal of Medicine,* 340**,** 1383-1389.

BOBER, S. L., CARTER, J. & FALK, S. 2013. Addressing female sexual function after cancer by internists and primary care providers. *The journal of sexual medicine,* 10**,** 112-119.

BRAY, F., JEMAL, A., GREY, N., FERLAY, J. & FORMAN, D. 2012. Global cancer transitions according to the Human Development Index (2008–2030): a population-based study. *The lancet oncology,* 13**,** 790-801.

BRINK, H.I & VAN RENSBURG, G. & VAN DER WALT, C. 2012. *Fundamentals of research methodology for healthcare professionals.* Third Edition, JUTA

BURNS, N. & GROVE, S. K. 2012. *The practice of nursing research: Appraisal, synthesis, and generation of evidence*, Elsevier Health Sciences.

CANCER, I. A. F. R. O. 2013. Latest world cancer statistics Global cancer burden rises to 14.1 million new cases in 2012: Marked increase in breast cancers must be addressed. *World Health Organization,* 12.

CORRÊA, C. S. L., LEITE, I. C. G., ANDRADE, A. P. S., FERREIRA, A. D. S. S., CARVALHO, S. M. & GUERRA, M. R. 2015. Sexual function of women surviving cervical cancer. *Archives of gynecology and obstetrics***,** 1-11.

DAVIDSON, S. 2011. Treatment for advanced cervical cancer: Impact on quality of life. *Critical reviews in oncology/hematology,* 79**,** 24-30.

DENNY, L. 2010. Cervical cancer in South Africa: an overview of current status and prevention strategies. *Continuing Medical Education,* 28.

DENNY, L. & ANORLU, R. 2012. Cervical cancer in Africa. *Cancer Epidemiology Biomarkers & Prevention,* 21**,** 1434-1438.

FALK, S. J. & DIZON, D. S. 2013. Sexual dysfunction in women with cancer. *Fertility and sterility,* 100**,** 916-921.

FERLAY, J., SOERJOMATARAM, I., ERVIK, M., DIKSHIT, R., ESER, S., MATHERS, C., REBELO, M., PARKIN, D., FORMAN, D. & BRAY, F. 2014. GLOBOCAN 2012 v1. 0, Cancer Incidence and Mortality Worldwide: IARC CancerBase No. 11. Lyon, France: International Agency for Research on Cancer; 2013. *Visit: http://globocan. iarc. fr*.

FLYNN, K. E., JEFFERY, D. D., KEEFE, F. J., PORTER, L. S., SHELBY, R. A., FAWZY, M. R., GOSSELIN, T. K., REEVE, B. B. & WEINFURT, K. P. 2011. Sexual functioning along the cancer continuum: focus group results from the Patient-Reported Outcomes Measurement Information System (PROMIS®). *Psycho-Oncology,* 20**,** 378-386.

FORSTER, V. 2004. Sexuality in palliative care: the problems and prospects. *In:* KINGHORN, S. & GAINES, S. (eds.) *Palliative nursing: improving end-of-life care.* 2nd ed. Edinburgh: Churchill Livingstone.

GLOBOCAN http://globocan.iarc.fr/Pages/fact_sheets_cancer.aspx

GRAZIOTTIN, A., SERAFINI, A. & PALACIOS, S. 2009. Aetiology, diagnostic algorithms and prognosis of female sexual dysfunction. *Maturitas,* 63**,** 128-134.

GREIMEL, E. R., WINTER, R., KAPP, K. S. & HAAS, J. 2009. Quality of life and sexual functioning after cervical cancer treatment: a long-term follow-up study. *Psycho-Oncology,* 18**,** 476-482.

GRIMM, D., HASENBURG, A., EULENBURG, C., STEINSIEK, L., MAYER, S., ELTROP, S., PRIESKE, K., TRILLSCH, F., MAHNER, S. & WOELBER, L. 2015. Sexual Activity and Function in Patients With Gynecological Malignancies After Completed Treatment. *International Journal of Gynecological Cancer,* 25**,** 1134-1141.

HOLE, G. 2011. *Graham Hole Research Skills Kruskal-Wallis handout, version 1.0, page 1* [Online]. Available: http://users.sussex.ac.uk/~grahamh/RM1web/Kruskal-Wallis%20Handoout2011.pdf [Accessed 7 Dec 2015].

INTERNATIONAL ATOMIC ENERGY AGENCY 2012. Management of cervical cancer: Strategies for limited-resource centres: a guide for radiation oncologists. Vienna: IAEA.

ISHAK, W. & TOBIA, G., 2013. DSM-V Changes in Diagnostic Criteria of Sexual Dysfunctions.*Reproductive Systems and Sexual Disorders.*

JENSEN, P. T., GROENVOLD, M., KLEE, M. C., THRANOV, I., PETERSEN, M. A. & MACHIN, D. 2003. Longitudinal study of sexual function and vaginal changes after radiotherapy for cervical cancer. *International Journal of Radiation Oncology* Biology* Physics,* 56**,** 937-949.

LINDAU, S. T., SURAWSKA, H., PAICE, J. & BARON, S. R. 2011. Communication about sexuality and intimacy in couples affected by lung cancer and their clinical-care providers. *Psycho-Oncology,* 20**,** 179-185.

LIU, H., YU, J., CHEN, Y., HE, P., ZHOU, L., TANG, X., LIU, X., LI, X., WU, Y. & WANG, Y. 2015. Sexual function in cervical cancer patients: Psychometric properties and performance of a Chinese version of the Female Sexual Function Index. *European Journal of Oncology Nursing*.

LJUCA, D. & MAROŠEVIĆ, G. 2011. Impact of chemoradiotherapy on vaginal and sexual function of patients with FIGO IIb cervical cancer. *Bosnian Journal of Basic Medical Sciences,* 11**,** 62.

MAREE, J., MOSALO, A. & WRIGHT, S. 2013. 'It depends on how the relationship was before you became ill': Black South African women's experiences of life partner support through the trajectory of cervical cancer. *European journal of cancer care,* 22**,** 459-467.

MAREE, J. E. & WRIGHT, S. C. 2011. Cervical cancer: does our message promote screening? A pilot study in a South African context. *European Journal of Oncology Nursing,* 15**,** 118-123.

MESTON, C. M. 2003. Validation of the Female Sexual Function Index (FSFI) in women with female orgasmic disorder and in women with hypoactive sexual desire disorder. *Journal of Sex &Marital Therapy,* 29**,** 39-46.

NANTON, V., OSBORNE, D. & DALE, J. 2010. Maintaining control over illness: a model of partner activity in prostate cancer. *European journal of cancer care,* 19**,** 329-339.

NATIONAL CANCER INSTITUTE. 2012. *Cancer types: cervical* [Online]. Available: http://www.cancer.gov/types/cervical [Accessed 10th October 2015].

NATIONAL CANCER REGISTRY. 2010. *Fact Sheet on theTop Ten Cancers per Population Group* [Online]. Available: http://www.gentledentaljersey.co.uk/mouth-cancer/ [Accessed 7 Dec 2015].

OLSSON, C., BERGLUND, A.-L., LARSSON, M. & ATHLIN, E. 2012. Patient's sexuality–A neglected area of cancer nursing? *European Journal of Oncology Nursing,* 16**,** 426-431.

OSKAY, Ü. Y., BEJI, N. K., BAL, M. D. & YıLMAZ, S. D. 2011. Evaluation of sexual function in patients with gynecologic cancer and evidence-based nursing interventions. *Sexuality and Disability,* 29**,** 33-41.

PILGER, A., RICHTER, R., FOTOPOULOU, C., BETETA, C., KLAPP, C. & SEHOULI, J. 2012. Quality of life and sexuality of patients after treatment for gynaecological malignancies: results of a prospective study in 55 patients. *Anticancer research,* 32**,** 5045-5049.

PLOTTI, F., SANSONE, M., DI DONATO, V., ANTONELLI, E., ALTAVILLA, T., ANGIOLI, R. & PANICI, P. B. 2011. Quality of life and sexual function after type C2/type III radical hysterectomy for locally advanced cervical cancer: a prospective study. *The journal of sexual medicine,* 8**,** 894-904.

REESE, J. B. 2011. Coping with sexual concerns after cancer. *Current opinion in oncology,* 23**,** 313-321.

REIS, N., BEJI, N. K. & COSKUN, A. 2010. Quality of life and sexual functioning in gynecological cancer patients: results from quantitative and qualitative data. *European Journal of Oncology Nursing,* 14**,** 137-146.

RODRIGUES, A. C., TEIXEIRA, R., TEIXEIRA, T., CONDE, S., SOARES, P. & TORGAL, I. 2012. Impact of pelvic radiotherapy on female sexuality. *Archives of gynecology and obstetrics,* 285**,** 505-514.

ROSEN, C. B., J. HEIMAN, S. LEIBLUM, C. MESTON, R. SHABSIGH, D. FERGUSON, R. D'AGOSTINO,R, 2000. The Female Sexual Function Index (FSFI): a multidimensional self-report instrument for the assessment of female sexual function. *Journal of Sex &Marital Therapy,* 26**,** 191-208.

ROYO, F., REDONDO, C., TOVES, L., GARCIA-TUNON, C. & TEJERO, C. 2014. Female Sexual Function in Castilla Y Leon (Spain): Normal Ranges. *Gynecol Obstet (Sunnyvale),* 4**,** 2161-0932.1000240.

SADOVSKY, R., BASSON, R., KRYCHMAN, M., MORALES, A. M., SCHOVER, L., WANG, R. & INCROCCI, L. 2010. Cancer and sexual problems. *The journal of sexual medicine,* 7**,** 349-373.

SERATI, M., SALVATORE, S., UCCELLA, S., LATERZA, R. M., CROMI, A., GHEZZI, F. & BOLIS, P. 2009. Sexual Function after Radical Hysterectomy for Early-Stage Cervical Cancer: Is There a Difference between Laparoscopy and Laparotomy? *The journal of sexual medicine,* 6**,** 2516-2522.

SNYMAN, L. 2012. Prevention of cervical cancer-how long before we get it right? *South African Journal of Obstetrics and Gynaecology,* 19**,** 2-3.

SONG, T., CHOI, C. H., LEE, Y. Y., KIM, T. J., LEE, J. W., KIM, B. G. & BAE, D. S. 2012. Sexual Function after Surgery for Early-Stage Cervical Cancer: Is There a Difference in It According to the Extent of Surgical Radicality? *The journal of sexual medicine,* 9**,** 1697-1704.

STAFFORD, L. & JUDD, F. 2010. Partners of long-term gynaecologic cancer survivors: psychiatric morbidity, psychosexual outcomes and supportive care needs. *Gynecologic oncology,* 118**,** 268-273.

STERBA, K. R., SWARTZ, R. J., BASEN-ENGQUIST, K., BLACK, P. C. & PETTAWAY, C. A. 2011. Long-term quality of life after radical prostatectomy in wives of men in the postoperative adjuvant androgen deprivation trial. *Supportive Care in Cancer,* 19**,** 1117-1124.

TANG, C. S.-K., LAI, B. P. & CHUNG, T. K. 2010. Influences of mastery, spousal support, and adaptive coping on sexual drive and satisfaction among Chinese gynecologic cancer survivors. *Archives of sexual behavior,* 39**,** 1191-1200.

TANGJITGAMOL, S., MANUSIRIVITHAYA, S., HANPRASERTPONG, J., KASEMSARN, P., SOONTHORNTHUM, T., LEELAHAKORN, S., THAWARAMARA, T. & LAPCHAROEN, O. 2007. Sexual dysfunction in Thai women with early-stage cervical cancer after radical hysterectomy. *International Journal of Gynecological Cancer,* 17**,** 1104-1112.

TSAI, T. Y., CHEN, S. Y., TSAI, M. H., SU, Y. L., HO, C. M. & SU, H. F. 2011. Prevalence and associated factors of sexual dysfunction in cervical cancer patients. *The journal of sexual medicine,* 8**,** 1789-1796.

UNIVERSITY OF THE WITWATERSRAND. 2015. *Radiation oncology* [Online]. Available: http://www.wits.ac.za/academic/health/clinicalmed/radiationoncology/9687/about_us.html [Accessed 7 Dec 2015].

VAN SCHALKWYK, S. L., MAREE, J. E. & WRIGHT, S. C. D. 2008. Cervical cancer: the route from signs and symptoms to treatment in South Africa. *Reproductive health matters,* 16**,** 9-17.

VAZ, A. F., CONDE, D. M., COSTA-PAIVA, L., MORAIS, S. S., ESTEVES, S. B. & PINTO-NETO, A. M. 2011. Quality of life and adverse events after radiotherapy in gynecologic cancer survivors: a cohort study. *Archives of gynecology and obstetrics,* 284**,** 1523-1531.

WHITE, I., ALLAN, H. & FAITHFULL, S. 2011. Assessment of treatment-induced female sexual morbidity in oncology: is this a part of routine medical follow-up after radical pelvic radiotherapy&quest. *British journal of cancer,* 105**,** 903-910.

WIEGEL, M., MESTON, C. & ROSEN, R. 2005. The female sexual function index (FSFI): cross-validation and development of clinical cutoff scores. *Journal of sex & marital therapy,* 31**,** 1-20.

WORLD HEALTH ORGANIZATION 1992. *International statistical classification of diseases and related health problems: tenth revision*, World Health Organization.

WORLD HEALTH ORGANIZATION 2006, pp.5. *Defining sexual health: report of a technical consultation on sexual health, 28-31 January 2002, Geneva*, World Health Organization.

WORLD HEALTH ORGANIZATION 2013. WHO guidelines for screening and treatment of precancerous lesions for cervical cancer prevention: supplemental material: GRADE evidence-to-recommendation tables and evidence profiles for each recommendation.

WORLD HEALTH ORGANIZATION 2014. Comprehensive cervical cancer control: a guide to essential practice.

YE, S., YANG, J., CAO, D., LANG, J. & SHEN, K. 2014. A systematic review of quality of life and sexual function of patients with cervical cancer after treatment. *International Journal of Gynecological Cancer,* 24**,** 1146-1157.

APPENDICES

APPENDIX A: Information letter

B: Informed consent

C: Request for permission

D: Data collection instrument

E: Hospital clearance

F: Ethics clearance certificate

APPENDIX A: INFORMATION LETTER

STUDY TITLE: Sexual function in women after cervical cancer treatment at an academic hospital in Johannesburg, South Africa.

INSTITUTION: Department of Nursing Education, Faculty of Health Sciences, University of the Witwatersrand.

Good day Madam,

My name is Imoleayo Fakunle, a Masters student at the Department of Nursing Education, University of Witwatersrand. I would like to invite you to participate in a study I am currently conducting the title is "***Sexual function in women after cervical cancer treatment."*** You can choose whether to participate in the study and if you agree, you will not lose your place in the queue. Should you agree to participate, I will ask you some questions and write your answers on a sheet of paper, which will be numbered without your name on it. This will take about 20 minutes of your time. You will give me permission to do this by signing a consent form. Should you experience sadness while answering these questions, I will ask Sister Makama, who is in charge of the unit, to counsel you if you so wish.

This study will not benefit you directly as a participant, but the findings may assist nurses understand, assess and provide care which may help improve sexual function in women during and after cervical cancer treatment. If you decide not to participate in this study, there will be no adverse effects as you will still receive your required care. Even if you choose to withdraw from the study, you will not lose any entitled care and benefits. Your name will not appear on the sheet of paper which has the answers to your questions and once I place this in the envelope, I will not be able to identify which belongs to you.

All information you give will be confidential. The findings and records of the study may be looked at by the Research Ethics Committee for quality and to inspect how I have analysed what you have told me. After I have analysed the information, all data will be sealed in an envelope and kept safe in the Department of Nursing Education for a period of two years. Once the findings have been published in a research report, the data will be destroyed. Your identity will not be revealed in this report.

If you have any questions or need further information, please feel free to contact me on bami246@yahoo.com or 0780052786. If you have any question about your rights as a study participant or any concerns about any aspect of the study, please call Prof Peter Cleaton-Jones at the Ethics Department of the University of the Witwatersrand on +27 11 717 1234.

Thank you.

Yours faithfully,

Imoleayo Fakunle

Department of Nursing Education

University of Witwatersrand

APPENDIX B: INFORMED CONSENT

Sexual function in women after cervical cancer treatment at an Academic Hospital in Johannesburg, South Africa

I confirm that I have been informed by the researcher about the nature, conduct and benefits of the study. Also, I have read and understood the content of the participant information sheet and informed consent on the study.

I am fully aware that my personal information will be processed anonymously in the reports of the study. I understand I have the right to withdraw my participation in the study. I have asked questions and made all necessary clarifications. I am prepared to participate in the study.

Participant's signature Date and time

I, Imoleayo Fakunle confirm that the above participant has been informed about the nature and conduct of the above study.

Researcher's signature Date and time

APPENDIX C: REQUEST FOR PERMISSION

Department of Nursing Education,
Faculty of Health Sciences,
University of Witwatersrand,
7, York Road, Parktown, 2193
Johannesburg
Date ……

The Chief Executive Officer, the Nursing Manager and the Unit Manager,
Charlotte Maxeke Johannesburg Academic Hospital,
Parktown, Johannesburg.

Dear Sir/Madam

REQUEST FOR PERMISSION TO CONDUCT A RESEARCH STUDY IN THE HOSPITAL

My name is Fakunle Imoleayo and I am a postgraduate student at the Department of Nursing Education, University of Witwatersrand and hereby request permission to conduct a research in the hospital titled '***Sexual function in women after cervical cancer treatment.'***

Cervical cancer is rated as the fourth highest cancer in women in the world and the fourth most common cause of death in women worldwide, with the highest being lung cancer. Guidelines on the management of cervical cancer ensure effective evidence based health outcome for women through the selection of appropriate treatment regimen depending on the stage of the disease. These treatment modalities have significant effects and complications on the sexual function of women. This study could provide baseline data and add to the knowledge in the field of Nursing Science. The study may also create awareness amongst nurses and help them provide comprehensive and evidence based care for the sexual functioning in women during cervical cancer treatment.

On approval by the Post Graduate Research Committee of the Faculty of Health Sciences, clearance from the Ethics Committee of Research and Human subjects of the University of Witwatersrand, I intend to commence the research project to explore the sexual function of women on cervical cancer treatment in the radiation oncology department of the hospital.

I wish to assure you that informed consent will be obtained from the participants and confidentiality will be ensured. A copy of the report will be made available to you on completion of the study if requested.

Yours faithfully,

Fakunle Imoleayo

APPENDIX D: DATA COLLECTION INSTRUMENT

SEXUAL FUNCTION IN WOMEN AFTER CERVICAL CANCER TREATMENT

Section A

General information:

1. Age_____
2. Educational level _____
3. Employment status _____
4. Marital status: Single ☐ Married ☐ Divorced ☐
5. Did you have sexual counselling before treatment? Yes ☐ No ☐
6. Which treatment did you receive?

   External beam radiation ☐ brachytherapy ☐ chemotherapy ☐
7. Period of follow up appointment 3 months ☐ 6 months ☐ 12 months ☐

SECTION B: FEMALE SEXUAL FUNCTION INDEX (FSFI)

INSTRUCTIONS: These questions ask about your sexual feelings and responses during the past four weeks. Please answer the following questions as honestly and clearly as possible. Your responses will be kept completely confidential. In answering these questions, the following definitions apply:

Sexual activity can include caressing, foreplay, masturbation and vaginal intercourse.

Sexual intercourse is defined as penile penetration (entry) of the vagina.

Sexual stimulation includes situations like foreplay with a partner, self-stimulation (masturbation), or sexual fantasy.

Check ONLY one box per question

Sexual desire or interest is a feeling that includes wanting to have a sexual experience, feeling receptive to a partners sexual initiation and thinking or fantasising about having sex.

1. Over the past 4 weeks, how **often** did you feel sexual desire or interest?

   Almost always or always ☐
   Most times (more than half the time) ☐
   Sometimes (about half the time) ☐
   A few times (less than half the time) ☐
   Almost never or never ☐

2. Over the past 4 weeks. How would you rate your **level** (degree) of sexual desire or interest?

Very high ☐
High ☐
Moderate ☐
Low ☐
Very low or none at all ☐

Sexual arousal is a feeling that includes both physical and mental aspects of sexual excitement. It may include feelings of warmth or tingling in the genitals, lubrication, (wetness), or muscle contractions.

3. Over the past 4 weeks, how **often** did you feel sexually aroused ("turned on") during sexual activity or intercourse?

No sexual activity ☐
Almost always or always ☐
Most times (more than half the time) ☐
Sometimes (about half the time) ☐
A few times (less than half the time) ☐
Almost never or never ☐

4. Over the past 4 weeks how would you rate your **level** of sexual arousal (turn on) during sexual activity or intercourse?

No sexual activity ☐
Very high ☐
High ☐
Moderate ☐
Low ☐
Very low or none at all ☐

5. Over the past 4 weeks, how **confident** were you about becoming sexually aroused during sexual activity or intercourse?

No sexual activity ☐
Almost always or always ☐
Most times (more than half the time) ☐
Sometimes (about half the time) ☐
A few times (less than half the time) ☐
Almost never or never ☐

6. Over the past 4 weeks, how **often** have you been satisfied with your arousal (excitement) during sexual activity or intercourse?

No sexual activity ☐
Almost always or always ☐
Most times (more than half the time) ☐
Sometimes (about half the time) ☐
A few times(less than half the time) ☐
Almost never or never ☐

7. Over the past 4 weeks, how **often** did you become lubricated ("wet") during sexual activity or intercourse?

No sexual activity ☐
Almost always or always ☐
Most times (more than half the time) ☐
Sometimes (about half the time) ☐
A few times (less than half the time) ☐
Almost never or never ☐

8. Over the past 4 weeks, how **difficult** was it to be lubricated ("wet") during sexual activity or intercourse?

No sexual activity ☐
Extremely difficult or impossible ☐
Very difficult ☐
Difficult ☐
Slightly difficult ☐
Not difficult ☐

9. Over the past 4 weeks, how often did you **maintain** your lubrication ("wetness") until completion of sexual activity or intercourse?

No sexual activity ☐
Almost always or always ☐
Most times (more than half the time) ☐
Sometimes (about half the time) ☐
A few times (less than half the time) ☐
Almost never or never ☐

10. Over the past 4 weeks, how **difficult** was it to maintain your lubrication ("wetness") during sexual activity or intercourse?

No sexual activity ☐
Extremely difficult or impossible ☐
Very difficult ☐
Difficult ☐
Slightly difficult ☐
Not difficult ☐

11. Over the past 4 weeks, when you had sexual stimulation or intercourse, how often did you reach orgasm (climax)?

No sexual activity	☐
Almost always or always	☐
Most times (more than half the time)	☐
Sometimes (about half the time)	☐
A few times (less than half the time)	☐
Almost never or never	☐

12. Over the past 4 weeks, when you had sexual stimulation or intercourse, how **difficult,** was it for you to reach orgasm (climax)?

No sexual activity	☐
Extremely difficult or impossible	☐
Very difficult	☐
Difficult	☐
Slightly difficult	☐
Not difficult	☐

13. Over the past 4 weeks, how **satisfied** were you with your ability to reach orgasm (climax) during sexual activity or intercourse?

No sexual activity	☐
Very satisfied	☐
Moderately satisfied	☐
About equally satisfied and dissatisfied	☐
Moderately dissatisfied	☐
Very dissatisfied	☐

14. Over the past 4 weeks, how **satisfied** have you been with the amount of emotional closeness during sexual activity between you and your partner?

No sexual activity	☐
Very satisfied	☐
Moderately satisfied	☐
About equally satisfied and dissatisfied	☐
Moderately dissatisfied	☐
Very dissatisfied	☐

15. Over the past 4 weeks, how **satisfied** have you been with your sexual relationship with your partner?

Very satisfied	☐
Moderately satisfied	☐
About equally satisfied and dissatisfied	☐
Moderately dissatisfied	☐
Very dissatisfied	☐

16. Over the past 4 weeks, how **satisfied** have you been with your overall sexual life?

Very satisfied	☐
Moderately satisfied	☐
About equally satisfied and dissatisfied	☐
Moderately dissatisfied	☐
Very dissatisfied	☐

17. Over the past 4 weeks, how **often** did you experience discomfort or pain during vaginal penetration?

Did not attempt intercourse	☐
Almost always or always	☐
Most times (more than half the time)	☐
Sometimes (about half the time)	☐
A few times (less than half the time)	☐
Almost never or never	☐

18. Over the past 4 weeks, how **often** did you experience discomfort or pain following vaginal penetration?

Did not attempt intercourse	☐
Almost always or always	☐
Most times (more than half the time)	☐
Sometimes (about half the time)	☐
A few times (less than half the time)	☐
Almost never or never	☐

19. Over the past 4 weeks, how would you rate your **level** (degree) of discomfort or pain during or following vaginal penetration?

Did not attempt intercourse	☐
Very high	☐
High	☐
Moderate	☐
Low	☐
Very low or none at all	☐

Thank you for completing this questionnaire

APPENDIX E

GAUTENG PROVINCE

HEALTH
REPUBLIC OF SOUTH AFRICA

CHARLOTTE MAXEKE JOHANNESBURG ACADEMIC HOSPITAL

Enquiries:
Ms. G. Ngwenya
Office of the Nursing Director
Tell: (011): 488-4558
Fax: (011): 488-3786
05 JUNE 2015

Ms. Imoleayo Fakunle
Department of Nursing Education
University of Witwatersrand

Dear Imoleayo Fakunle

RE: "Sexual function in women after Cervical Cancer treatments at an Academic Hospital in Johannesburg"

Please note that permission to conduct the above mentioned study is provisional approved. Your study can only commence once ethics approval and supporting letter from Head of Department is obtained. Please forward a copy of your ethics clearance certificate as soon as the study is approved by the ethics committee for the CEO's office to give you the final approval to conduct the study.

Supported / not supported

Ms. M.M Pule
Nursing Director
DATE: 05/06/2015

Approved / not approved

Ms. G. Bogoshi
Chief Executive Officer
DATE: 9/6/2015

APPENDIX F

R14/49 Miss Imoleayo Fakunle

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)

CLEARANCE CERTIFICATE NO. M150432

NAME: (Principal Investigator)	Miss Imoleayo Fakunle
DEPARTMENT:	Nursing Education Charlotte Maxeke Johannesburg Academic Hospital
PROJECT TITLE:	Sexual Function in Women after Cervical Cancer Treatment at an Academic Hospital in JHB, South Africa
DATE CONSIDERED:	24/04/2015
DECISION:	Approved unconditionally
CONDITIONS:	
SUPERVISOR:	Prof Lize Maree
APPROVED BY:	Professor P Cleaton-Jones, Chairperson, HREC (Medical)
DATE OF APPROVAL:	29/05/2015

This clearance certificate is valid for 5 years from date of approval. Extension may be applied for

DECLARATION OF INVESTIGATORS

To be completed in duplicate and **ONE COPY** returned to the Secretary in Room 10004, 10th floor, Senate House, University.

I/we fully understand the conditions under which I am/we are authorized to carry out the above-mentioned contemplated, from the research protocol as approved, I/we undertake to resubmit the application to the Committee **I agree to submit a yearly progress report**.

Principal Investigator Signature _____ Date _____

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES