HEALTH-RELATED QUALITY OF LIFE OF MEN TREATED WITH HORMONAL THERAPY FOR PROSTATE CANCER

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A research report submitted to the Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, in partial fulfilment of the requirements for the degree

of

Master of Science in Nursing

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DECLARATION

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

Signature:  Date: _____

Tikondwe Kaponda Sichinga

DEDICATION

I dedicate this work to my wife Khwima Gondwe Sichinga and my daughters, Jannalyn and Ivanna Sichinga who have always been supportive. I also dedicate the work to my father and mother who were a source of encouragement and motivation that I aim high, never to give up and always to achieve my dreams.

ABSTRACT

HRQoL is the central focus of treatment and care for cancer patients regardless of treatment and whether the goal of treatment is cure, control or palliation.

Research question: What is the HRQoL of men treated with hormonal therapy for prostate cancer at an academic hospital in Gauteng?

Aim of the study: The study aimed to describe the HRQoL of men treated with hormonal therapy for prostate cancer at an academic hospital in Gauteng.

Research Design: A cross-sectional design was used. A sample of 113 respondents were recruited using a convenience sampling. The European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire (EORTC QLQ-C30) and prostate-specific (EORTC QLQ - PR25) instruments were used for data collection. Data were analysed using STATA computer programme.

Results: The HRQoL was affected by the disease and treatment side effects. All the domains except role functioning were compromised.

Recommendations: Nurses are encouraged to conduct accurate assessment to manage patients holistically.

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LIST OF ABBREVIATIONS

DRE	Digital rectal examination
EBRT	External Beam Radiotherapy
EORTC	European Organisation for Research and Treatment of Cancer
HRQoL	Health-related quality of life
IARC	International Agency for Research on Cancer
MRI	Magnetic resonance imaging
NIOH	National Institute for Occupation Health
PSA	Prostate specific antigen
QoL	Quality of life
WHO	World Health Organisation

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CHAPTER ONE

OVERVIEW OF THE STUDY

1.1 INTRODUCTION

Chapter one introduces the study and provides a background to the study, the research problem and question, the aim and significance of the study. A brief description of the research design and methods and ethical considerations are provided as well as operational definitions.

1.2 BACKGROUND

Cancer is reported to be the leading cause of death among non-communicable diseases worldwide. It is estimated that the world will register 18 million newly diagnosed people with cancer in 2018, a rise from 14.1 million people reported in 2012. It is also estimated that 9.6 million people will die from cancer of which more than 50% will occur in Asian countries where about 60% of the world's population lives. The differences in incidence and mortality rate reflect differences in cancer profiles, availability of screening services, treatment and late detection of cancers in less developed countries (Bray et al., 2018; Torre et al., 2015). Poor cancer registration systems and the lack of data in most African countries make it difficult to accurately describe the burden of cancer (Adeloye et al., 2016; Ferlay et al., 2015).

Prostate cancer is ranked fourth among all cancers and is the second most common cancer in men both in developed and developing countries. It is estimated that there are about 1.3 million men newly diagnosed with prostate cancer annually and 359,000 deaths globally. Prostate cancer is the fifth cause of cancer deaths in the world. The incidence rate for Southern Africa is currently at 64.1 per 100,000 and the mortality rate at 26.8 per 100,000. The mortality rate for Southern Africa is the highest compared to other regions (Bray et al., 2018). Prostate cancer was ranked second among all cancers and first among male cancers in South Africa in 2014 (NIOH, 2014). Babb et al. (2014) reported that South Africa is experiencing a steady increase in incidence and mortality rates from prostate cancer among men of all races.

Prostate cancer presents with an enlarged prostate gland, urinary retention, dysuria, fatigue, urinary frequency, difficulty passing urine, and erectile dysfunction (Tindall et

al., 2014; Appleton et al., 2015). Well established risk factors are old age, black race and family history of prostate cancer (Anderson et al., 2013). The main diagnostic tests include digital rectal examination (DRE), serum concentration of Prostate-Specific Antigen (PSA) and biopsy guided by trans-rectal ultrasound (TRUS) (Heidenreich et al., 2014). Treatment options include active surveillance, watchful waiting, radical prostatectomy, radiotherapy, chemotherapy and androgen deprivation therapy (Drummond et al., 2015).

Hormonal therapy has increasingly in recent years become the standard method of decreasing the size of a tumour in both early and advanced stages of prostate cancer. The therapy is recommended for use before, during and after definitive radiotherapy for intermediate and high-risk localized cancer. It is also administered to patients with localised cancer who will undergo surgery (Lepor & Shore, 2012) and in metastatic prostate cancer (Heidenrich et al., 2014). Hormonal therapy has similar effects to orchiectomy of blocking the action of testosterone, which controls the growth of sexual organs including the prostate gland. It also controls erection and muscle strength (Schulman et al., 2010). The side effects of hormonal therapy include hot flushes, erectile dysfunction, fatigue and cardiovascular complications such as congestive heart failure, myocardial infarction and pulmonary embolism that influence quality of life (QoL) (Lepor & Shore, 2012).

Evidence has shown that hormonal therapy significantly influences health-related quality of life (HRQoL) of patients receiving the treatment. HRQoL focuses on the effects of illness and treatment on QoL. The side effects of treatment for prostate cancer cause various impairments, physical limitations and participation restrictions, which cause persistent emotional and social distress that affects the QoL (Jakobsson et al., 2013; Drummond et al., 2015). Physical- and social functioning domains of HRQoL have been reported to be severely affected in patients who receive hormonal therapy. The patients who receive hormonal therapy experience severe fatigue, pain, dyspnoea, loss of appetite, decreased cognitive functioning, memory problems, gynaecomastia and severe sexual dysfunction (Sountoulides & Rountos, 2013; Drummond et al., 2015). Fatigue minimises functional ability and has been reported to be the major cause of decreased HRQoL (Farkkila et al., 2014). Similarly, Brassell et al. (2013) reported a significant decline in sexual functioning in low income prostate cancer patients, as there is an association between financial problems and QoL (Kimman et al., 2012).

1.3 RESEARCH PROBLEM AND QUESTION

The research problem for the study is prostate cancer, specifically the HRQoL of men treated for this disease by means of hormonal therapy. Irrespective of the fact that prostate cancer is the most common cancer in men in South Africa (NIOH, 2014) little is known about the lives of men living with prostate cancer that can guide nurses to render holistic care to these patients. Unfortunately, research conducted in Africa primarily focuses on the prevention of cancer in women (Maree & Schmollgruber, 2014). This study wishes to provide baseline data to address this knowledge gap.

To address the research problem, the following research question was formulated: What is the HRQoL of men treated with hormonal therapy for prostate cancer at an academic hospital in Gauteng?

1.4THE AIM OF THE STUDY

The study aimed to describe the HRQoL of men treated with hormonal therapy for prostate cancer at an academic hospital in Gauteng.

1.5 SIGNIFICANCE OF THE STUDY

As already mentioned, little is known about cancer in men in Africa, even about prostate cancer, the most common cancer in men. With this study the researcher hoped to provide baseline data in an attempt to address the knowledge gap, stimulate research and guide nurses to provide holistic patient-centred care by designing on-going support programs that could improve HRQoL.

1.6 RESEARCH DESIGN AND METHODS

A cross-sectional design was used. The study was conducted at the Urology department and Radiotherapy clinic of an academic hospital in Johannesburg. The target population consisted of all patients with prostate cancer treated with hormonal therapy. Convenience sampling was used to select a sample of 113 respondents (n=113). The sample size was calculated from a total population of 158 (n=158).

Data were collected using structured interviews. The data collection instruments used were a simple general information questionnaire, the European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire (EORTC-QLQ-C30) and prostate-specific questionnaire (EORTC-QLQ - PR25). Data were analysed

using the STATA computer programme and presented as descriptive statistics. The Kruskal-Wallis H test was used to determine the statistical significance of the different variables (Voerman et al., 2006). Validity and reliability were enhanced by using a validated structured questionnaire.

The study applied the ethical principles guided by the Belmont Report which include the principle of beneficence, respect for human dignity and justice in order to protect the study respondents (Polit & Beck, 2014).

1.7 OPERATIONAL DEFINITIONS

For this study, the following definitions applied:

Health-related quality of life*: – "Reflects the way individuals perceive and react to their health status and the nonmedical aspects of their lives, which include health-related factors, such as physical-, functional-, emotional-, and mental well-being as well as non-health-related elements, such as job, family, friends, and other situations in life" (Lin et al., 2013: 8).

Quality of life*: - ‘‘An individual’s perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns" (WHO, 1995:1405)

NOTE*: for the purpose of this study, HRQoL and QoL will be used synonymously.

1.8 SUMMARY

Chapter one introduced the reader to the study. It presented the background, research problem and question, the aim, significance, research design and methods, ethical considerations and operational definitions of the study. Chapter two presented the literature review.

1.9 OUTLINE OF THE STUDY

Chapter 1: Overview of the study
Chapter 2: Literature review
Chapter 3: Research design and methods
Chapter 4: Results of the study
Chapter 5: Discussion, justification, limitations, recommendations and conclusion

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

The previous chapter introduced the reader to the study. Chapter two focussed on global and African statistics on cancer, prostate cancer as a life-threatening disease, risk factors, screening and early detection, diagnosis, staging and grading, treatment and HRQoL.

2.2 CANCER, A GLOBAL HEALTH PROBLEM

Cancer is a global health problem of major concern due to increasing trends in morbidity and mortality rates. The burden of cancer is eminent in both developed and developing countries, as it is causing more deaths than HIV/AIDS, malaria and tuberculosis combined. The demographic and epidemiological changes taking place globally contribute to a rise in the burden of cancer. These changes include a longer lifespan, reduction in deaths from infections and increased testing in asymptomatic individuals (Bray et al., 2018; Jemal et al., 2011; Babb et al., 2014). The global increase in life expectancy is leading to an increase in the elderly population, a group that is at high risk for non-communicable diseases like cancer. In addition, the increase in adopting western lifestyles, which include smoking, alcohol consumption and obesity in developing countries, will change the trend of the cancer burden so that developing countries would bear much of the cancer morbidity and mortality (Thun, 2010).It is estimated that by 2030, the developing countries would have 80% or more of the global cancer burden (Farmer et al., 2010). The burden of cancer is likely to affect and compromise the QoL of patients globally (Nayak, et al., 2017).

The estimated number of newly diagnosed men with cancer in 2018 is 18.1 million with an estimated 9.6 million cancer deaths, a rise from 14.1 million newly diagnosed and 8.2 million deaths in 2012. It was reported that about 50% of the newly diagnosed and more than 50% of deaths in 2018 will occur in Asia. Of the newly diagnosed, Europe accounts for 23.4%, America 21% and Africa 5.8%. Much as the data were collected from national registries, it mostly covered major towns, which are not representative of entire countries, and rural areas are underreported. Cancer registry coverage in Africa is estimated at 13%. Countries that did not have a cancer registry, had estimates derived using registry data from neighbouring countries (Bray

et al., 2018; Ferlay et al., 2015).

Despite having a low proportion of newly diagnosed men in Africa, the death proportion was higher (7.3%). Many factors have contributed toward the increase in mortality rates of cancer. Differences in exposure to risk factors and susceptibility, and the availability and use of screening services are possible explanations for the differences in the distribution of cancers in different geographical regions in Africa (Bray et al., 2018). The growth in the elderly population in Africa (Nabalamba & Chikoko, 2011), adoption of western lifestyle (Jemal et al., 2011), prevalence of infectious agents like Human Immunodeficiency Virus, Human Papilloma Virus and Hepatitis B and air pollution are some of the risk factors (Thun, 2010; Shanley et al., 2016).

2.3 PROSTATE CANCER

2.3.1 Prostate cancer statistics

Prostate cancer was the fourth leading among all cancers and the most frequent type of cancer diagnosed in men in 2018. It was estimated that there were about 1.3 million newly diagnosed men with prostate cancer and 359,000 deaths globally. The highest incidence rates of 86.4 and 85.7 per 100,000 were reported in Australia/New Zealand and Northern Europe respectively. The incidence rate of Southern Africa was 64.1 per 100,000 and the mortality rate was 26.8 per 100,000. The mortality rate for Southern Africa was the highest compared to other regions (Bray et al., 2018). Prostate cancer was ranked second among all cancers and first among male cancers in South Africa in 2014 (NIOH, 2014). Babb et al. (2014) report that South Africa is experiencing a steady increase in incidence and mortality rates from prostate cancer among men of all races.

Although South Africa is one of the countries in Sub-Saharan Africa with a national cancer registry, the population-based registration is in its infancy and cancer is underreported (Singh et al., 2016). The South African National Cancer Registry ranks prostate cancer second among all cancers and first among male cancers when skin cancer is excluded. It is the commonest cancer among all population groups in South Africa excluding basal cell carcinoma. Large disparities are reported in the age-standardised incidence rates and age-standardised mortality rates among the different population groups in South Africa (Babb et al., 2014).

Histological records indicate that there were 6,778 men diagnosed with prostate

cancer in South Africa representing about 19% of all cancers in men in 2013. There has been a steady increase in the number of people newly diagnosed and deaths from prostate cancer for the past twenty years with an incidence rate for prostate cancer of 67.9 per 100,000 reported in 2012 (Babb et al., 2014; Le Roux et al., 2015). The increasing prostate cancer burden will lead to an increased financial burden as a result of cancer care costs, which will contribute towards poor QoL (Fenn et al., 2014).

2.3.2 Risk factors and prevention

There are non-modifiable and modifiable risk factors for development of prostate cancer. The non-modifiable risk factors include age, ethnicity and genetic mutations, while the modifiable risk factors can be modified, including lifestyle factors (Cuzick et al., 2014). The extent of exposure to risk factors leads to variations in the burden of prostate cancer and how QoL of individuals is affected.

According to the US epidemiological surveillance from 2000 to 2008, the prostate cancer incidence rate for men aged 40-44 was 9.2/100,000 and in men aged 70-74 was 984.8/100,000 (Leitzmann & Rohrmann, 2012). Jalloh et al. (2013) reported an average age at diagnosis as between 66.6 and 77.5 years while Babb et al. (2014) reported 68 years as the average age at diagnosis and 74 years at death. The age of patients influences treatment decisions and has been reported to be associated with changes in the QoL of patients. Study findings show that younger and older patients report differences in the QoL (Hampson et al., 2015), which was an important consideration in the current research.

Prostate cancer affects ethnic groups differently. The incidence of prostate cancer has been higher among the black population (219.8 per 100,000) compared to white men (30.4 per 100,000). It was reported that in the US at the age of 60 years, black men had 20.5% risk of developing primary prostate cancer, while white men had 15.9% chance.The mortality rate has also been higher among men of African descent, including the Caribbean (29 per 100,000) and Sub-Saharan Africa (29-24 per 100,000) than white males (Ferlay et al., 2015; Merrill & Sloan, 2012)

Genetic studies have found an increased relative risk for developing prostate cancer in men who have first degree relatives with prostate cancer. The studies have revealed a link of 5-10% of prostate cancer to familial predisposition. The risk for prostate cancer doubles once a family member is diagnosed with prostate cancer.

The risk further increases by five to eleven times if two or more members of the same family have the disease. In a family with a history of prostate cancer, earlier onset of six to seven years has been reported. Men younger than 65 years who have a first degree relative with prostate cancer have a higher risk than older men with first degree relative with prostate cancer (Cuzick et al., 2014; Mottet et al., 2017).

Cuzick et al. (2014) reported of geographical variations in both incidence and mortality of prostate cancer. The incidence and mortality of prostate cancer in Sweden was twice that in Spain. The incidence among Indians living in the US is higher than the American white population and also higher than in their country of origin.

Environmental, behavioural and dietary factors play a role in the development, progression or prevention of prostate cancer. Exogenous factors like smoking, diet, sexual behaviour, alcohol consumption, exposure to ultraviolet light and occupational exposure have been reported to affect the progression of latent to clinical prostate cancer. There is currently no strong evidence linking factors like ultraviolet light, urinary tract infection and development of prostate cancer. A stronger association has been established between smoking and prostate cancer development and promotion of metastatic disease. However, there is currently no strong evidence that dietary interventions and lifestyle changes including a reduction in intake of animal fat, increase in fruit and vegetable intake, would reduce the risk of prostate cancer. According to Cuzick et al. (2014) and Heidenreich et al. (2014) there is currently no effective scientifically proven medical intervention that would reduce the progression of prostate cancer.

A study of 5-alpha-reductase inhibitor (5-ARI) finasteride has shown a reduction of prostate cancer by 25% in prostate cancer with Gleason score of 6 or less, however, there was an increase in high-risk disease in men undergoing PSA screening and DRE. After four years of follow-up in a randomised controlled trial in 2010 using dutasteride, a reduction in the incidence among men with an increased risk of prostate cancer was observed but there was no effect in men with Gleason score of 7 and above. 5-ARI and dutasteride have not shown that they can prevent cancer but can temporarily shrink a tumour. Much as these drugs suppress production of PSA, the reduced level might give a wrong impression, resulting in late diagnosis of high-grade disease (Cuzick et al., 2014; Andriole, 2010).

2.3.3 Screening and early detection

The World Health Organisation (WHO) (2007) stated that early detection involves early diagnosis and screening. While early diagnosis focuses on symptomatic people, screening targets the population at risk who is asymptomatic. Screening has been defined as a process of carrying out tests on individuals in a population with no presenting symptoms of a disease. The different types of screening include population-based screening and opportunistic screening. Population-based screening is well organised with monitoring mechanisms in place and offered to all individuals in a target population. Opportunistic screening is not systematically organised and is offered in routine health services to individuals with or without symptoms that present themselves to a health care practitioner for reasons unrelated to that disease (WHO, 2007; Mottet, 2017). The harms and benefits of prostate cancer screening have a bearing on the QoL of individuals (Heijnsdijk et al., 2012).

Screening is aimed at detecting cancer in an early stage to institute curative measures, and to reduce the development of symptomatic metastatic disease and death (Ilic et al., 2013; Mottet, 2016). The signs and symptoms, raised serum PSA levels and an abnormal DRE necessitate the need for further investigation to diagnose prostate cancer. Early identification of cancer helps in early instituting of measures that increase chances of cure, improved health status and QoL (Mottet et al., 2017).

Prostate cancer screening is done using serum PSA blood levels and usually with DRE. Evaluation of PSA levels is done with other diagnostic techniques when managing a patient with prostate cancer. Not all low or high PSA levels indicate that prostate cancer, as PSA levels are organ specific and not cancer specific. Results from PSA screening studies have not been conclusive in determining the need for biopsy. There is currently no strong evidence to support or disregard population-based screening for early detection of prostate cancer (Mottet et al., 2016).

PSA based screening detects many patients with asymptomatic prostate cancer who will either not progress or will progress slowly and remain asymptomatic in their lifetime. Findings have however shown that PSA based screening produced false-positive results (Schroder et al., 2009). False positive test results can have negative psychological and physical consequences which can result in financial implications. Individuals that have had false-positive results are more likely to seek further tests than negative test results. It is estimated that in 10 years, about 15-29% of patients

who had undergone PSA testing, would go for biopsy depending on the PSA cut-off point and testing interval used (Lin et al., 2008). Recent evidence has shown that 33% of men who had biopsies experienced pain, fever, bleeding, infection, transient urinary difficulties and some needed hospitalisation (Rosario, 2012).

DRE can detect about 18% of patients with prostate cancer regardless of PSA levels. DRE is a procedure during which a health practitioner's gloved finger is lubricated and inserted into the rectum to examine the prostate for bumps, enlargements, or suspicious hard areas. DRE may easily detect prostate cancer in the peripheral zone with a volume ≥ 0.2 mL and DRE can indicate whether a prostate biopsy is recommended, especially in advanced tumours. Because DRE lacks sensitivity and has a possibility of missing early tumours, it is recommended for use with other investigations in screening for prostate cancer (Mottet et al., 2016).

A systematic review of literature published by Cochrane (2013) agreed with other studies that screening is associated with an increased diagnosis of localised prostate cancer (Ilic et al., 2013). Djulbegovic et al., (2010) also revealed that there was a 46% increase in the diagnosis of prostate cancer in the screened group versus the unscreened group. The findings showed that an increase in men with early-stage prostate cancer contributed to the over-diagnosis. However, the Cochrane review of randomised controlled trials reported no survival benefit from prostate cancer screening and was associated with minor and major harms like over-diagnosis and -treatment. Similarly, Djulbegovic et al., (2010) failed to find a significant impact of prostate cancer screening on overall mortality from prostate cancer.

Two large randomised studies have reported how PSA impacts on health outcomes. A European randomised study of screening for prostate cancer was carried out involving seven European countries. The results revealed that screening reduced the mortality rate by 20% among prostate cancer patients aged 55 to 69 years (Schröder et al., 2009). These findings agreed with the mortality results from the Goteborg randomised population-based prostate cancer screening trial which indicated that screening for prostate cancer reduced the mortality rate by 50% over 14 years (Hugosson et al., 2010). In contrast, another big prostate cancer randomised screening study was carried out in the US. Participants aged 50-74 years were followed up for 13 years and the study found that screening did not significantly decrease deaths from prostate cancer. The study also revealed a statistically

significant relative increase of 12% in men diagnosed with prostate cancer (Andriole et al., 2012).

The findings from various prostate cancer screening studies have led to various institutions developing recommendations regarding PSA-detection screening. The United States Preventive Services Task Force, American Urological Association and the American Cancer Society do not recommend routine prostate cancer screening for the general population at any age. The United States Preventive Services Task Force does not include surveillance of PSA after diagnosis of prostate cancer. The task force recommends that African-American men with a family history of prostate cancer should begin discussing screening with the doctor at the age of 45, and men at very high risk at the age of 40. All men should be well informed of the risks and benefits of screening at the appropriate time so that they make informed decisions about their health (Mottet et al., 2017).

The American Cancer Society recommends that men who are asymptomatic, with at least a 10-year life expectancy should be given information on the uncertainties, risks and benefits of screening in order to decide for or against screening. Men at average risk of developing prostate cancer should be given information on prostate screening at 50 years. Those at higher risk, including African Americans and men with a first-degree relative diagnosed with prostate cancer before age 65, should get information from the age of 45 years. Men at much higher risk (more than one first-degree relative diagnosed with prostate cancer at an early age) should get information at age 40 years (Wolf et al., 2010).

Based on the study finding that screening reduces mortality rate by 20%, the American Urological Association recommends that men aged 55-69 years and at average risk should discuss with their doctor their decision to undergo screening. The association does not recommend annual screening based on individual choice due to the harms associated with screening (Carter, 2013).

Limited studies have been done in South Africa on cancer incidence, mortality and screening for prostate cancer. An ongoing Southern African Prostate Cancer Study indicates that lack of screening for prostate cancer is a factor contributing towards the late presentation of aggressive cancer, especially in rural areas. Due to lack of screening with PSA, other treatment options like surgery are not available to patients who would have benefitted from the service. The European Randomised Study of Screening for Prostate Cancer findings have revealed a 21% relative mortality

reduction with use of PSA in comparison with not screening at an average of 12 years follow up despite the shortfall of over-diagnosis (Schröder, 2014). The South African government has not yet made provision for routine screening except in high-risk cases (Coetzee et al., 2013). Coetzee et al. indicated that in South Africa, PSA is only recommended in patients whose life expectancy is more than 10 years in these categories: -

- Black Africans, 40 years old and with a family history of prostate cancer
- All males aged 45 years and above
- Patients with a history of lower urinary tract infection and/or clinical suspicion of prostate cancer regardless of age.

2.3.4 Physiology, signs and symptoms

Prostate cancer affects the prostate gland which is a sex accessory gland surrounding the urethra. The gland's epithelial cells produce secretions that are released with semen during intercourse (Dawson & Kelly, 2007). The prostate gland is in the pelvis below the bladder and in front of the rectum. It is composed of central, transitional and peripheral zones. Most cancers develop in the peripheral zone and may be palpated during a DRE as it is close to the rectum. The transition zone surrounds the urethra and it enlarges as men age (Yarbro, Wujcik & Gobel, 2018; Paterson, 2015). The prostate epithelial cells depend on androgens for growth, of which testosterone is the major circulating androgen (Dawson & Kelly, 2007). Chemicals that block the action of the androgens inhibit the development of the prostate.Prostate cancer is known to have a slow growth pattern. The most common cancer of the prostate is adenocarcinoma. Cancerous changes in the prostate tissue are called prostatic intraepithelial neoplasia, which can either be low- or high-grade. However, currently, it is not possible to predict if prostate intraepithelial neoplasia will end in a cancerous lesion. Another change that is considered part of progression from benign to malignant tissue in cancer morphology is atypical small acinar proliferation. Since both prostate intraepithelial neoplasia and atypical small acinar proliferation are not yet cancerous, there are currently no recommendations to perform a biopsy if a patient has either prostate intraepithelial neoplasia or atypical small acinar proliferation. A large tumour volume, elevated PSA levels and invasive cancer with high Gleason score are considered clinically significant (Yarbro et al., 2018).

The prostate gland secretes seminal fluid that mixes with sperms for easy flow and protection against vaginal acidic environment. Both sperms and urine pass through the prostate and any abnormal growth can obstruct the flow of fluid (Yarbro et al., 2018). In its early stages, prostate cancer presents with no signs and symptoms. Enlargement of the prostate that obstructs the urethra presents with urinary tract obstructive symptoms like frequency, reduced flow, incomplete bladder emptying, hesitancy, nocturia and urgency. The patient may also experience erectile dysfunction. In advanced stage, the patient may present with urethral obstruction, which can lead to hydronephrosis and compromised kidney function, fatigue, anorexia, rectal obstruction, oedema of the lower extremities and pancytopenia. In case of metastasis to the bones, the patient may have back pain which can also indicate spinal cord compression. The pain can either be localised or referred to the legs and the abdomen (Yarbro et al., 2018).Prostate cancer signs and symptoms and complications affect the prognosis and compromise the QoL of patients in various ways (Braun et al., 2012; Roth, Weinberger & Nelson, 2008).

2.3.5 Diagnosis

The diagnostic tests for prostate cancer are serum concentration of PSA, DRE and TRUS guided biopsies. A definitive diagnosis of prostate cancer is based on findings from biopsy results. The decision to carry out diagnostic tests or staging takes into consideration treatment options available to the patient, patient preference, age, co-morbidity and condition of the patient (Heidenreich et al., 2014; Mottet et al., 2016). Decline in QoL has been reported by men diagnosed with prostate cancer, which is relevant to the study (Cuypers et al., 2018).

The normal PSA level is less than 4 ng/ml of blood. If the PSA level is raised, chances of a person having prostate cancer are high. However, findings have also shown that even PSA levels less than 4ng/ml do not always mean that a person does not have prostate cancer. Studies have shown that 15% of men with PSA below 4ng/ml will have prostate cancer on biopsy. The risk for prostate cancer is one to four times if PSA is between 4-10 ng/ml and it goes up to 50% if PSA is more than 10ng/ml. Different cut-off points are used to decide whether to carry out a biopsy. There are other factors like age race and family history that may also affect the decision (Heidenreich et al., 2011; Huang et al., 2010).

A new biomarker, prostate cancer antigen 3 (PCA3), which is still under investigation, uses urine to measure PSA. It has been reported to be helpful in the general population but cannot be used to counsel an individual for biopsy to rule out prostate cancer. The test has a higher sensitivity and specificity than serum PSA (Heidenreich et al., 2014).

DRE, regardless of PSA levels can detect some cancers in the peripheral zone. A biopsy is indicated if the DRE findings are abnormal and the Gleason score is high (Mottet, 2017). In a study where patients had organ-confined cancer, PSA was able to detect 75% while DRE detected 56% of cancers. DRE and PSA should be used together since both are able to increase the detection of organ-confined cancer by 78% over DRE alone (Catalona et al., 2017).

A TRUS is the standard procedure for obtaining a biopsy for prostate cancer even though it has low specificity and sensitivity (Harvey et al., 2012). It should be done in case of high PSA and/or abnormal DRE in consideration of the patient's age and condition. An endorectal probe with a biopsy guide is inserted into the patient's rectum to capture the image of a tumour through sound waves. The patient is given local anaesthesia for pain and prophylactic antibiotic. The TRUS can sometimes detect tumours that may not have been detected by a DRE and may not always distinguish between normal and cancerous tissue (Heidenreich et al., 2011; Huang et al., 2012; Harvey, 2012).

A biopsy is a procedure in which small samples of the prostate are removed using a core needle and examined under a microscope. A core needle is inserted through the wall of the rectum into the prostate while TRUS is used to clearly observe the gland. A thorough review of the patient's history, age, ethnicity, heredity, comorbidities, and their results from PSA blood tests, DREs, and imaging tests should be done before deciding if a biopsy is needed. A repeat should be done and supported by suspicious DREs, imaging results, and the patient's overall history and risk factors. Prostate cancer biopsies can be performed by a transrectal, perineal, or transurethral method. Once the suspicious tissue is extracted, the specimen can be examined pathologically to confirm cancer. Magnetic resonance imaging (MRI) can also be used when there is clinical suspicion for prostate cancer despite negative prostate biopsies (Heidenreich et al., 2014; Mottet et al., 2016). Rectal haemorrhage and infection have been reported as some of the adverse effects of TRUS guided biopsy (Harvey, 2012).

2.3.6 Staging and grading

The literature clearly explains the staging and grading of prostate cancer. Staging is the description of the extent to which cancer has spread. The two types of staging for prostate cancer are clinical and pathological staging. The clinical staging is based on DRE, biopsy, x-rays, CT and /or MRI and bone scans. Investigations like x-rays, bone scans, CT scans and MRI may not always be required, but are recommended based on the findings of PSA, the size of a tumour and the clinical stage of cancer. The pathological staging is based on histological findings from biopsy (Buyyounouski et al., 2017; Mottet et al., 2016). Different stages and grades of prostate cancer affect QoL in different ways, which is of interest to the current study (Porreca et al., 2018).

The European Association of Urology (2016) guidelines stipulate the conventional staging of prostate cancer using the American Joint Committee on Cancer, TNM classification system (Table 2.2), which is based on:

- the evaluation of a primary tumour (T category),
- whether cancer has spread to regional (nearby) lymph nodes (N category),
- whether there is evidence of distant metastasis (M category),
- the PSA level at the time of diagnosis, and
- the Gleason score based on a biopsy.

Table 2.1 American Joint Committee on Cancer TNM Criteria

STAGE	DESCRIPTION
T	**PRIMARY TUMOUR**
TX	Primary tumour cannot be assessed
T0	No evidence of primary tumour
T1	Clinically inapparent tumour, not palpable
	T1a- Tumour incidental histological finding in 5% or less of tissue resected T1b- Tumour incidental histological finding in more than 5% of tissue resected T1c- Tumour identified by needle biopsy (e.g. because of elevated PSA level)
T2	Tumour that is palpable and confined within the prostate
	T2a- Tumour involves one half of one side or less T2b- Tumour involves more than half of one side, but not both lobes T2c- Tumour involves both lobes
T3	Tumour extends through the prostate capsule
	T3a- Extracapsular extension (unilateral or bilateral) including microscopic bladder neck involvement T3b- Tumour invades seminal vesicle(s)
T4	Tumour is fixed or invades adjacent structures other than seminal vesicles: external sphincter, rectum, levator muscles, and/or pelvic wall
N	**Regional Lymph Nodes**
	NX- Regional lymph nodes cannot be assessed N0- No regional lymph node metastasis N1- Regional lymph node metastasis
M	Distant metastasis
	M0- No distant metastasis M1- Distant metastasis M1a- Non-regional lymph node(s) M1b- Bone(s) M1c- Other site(s)

Source: Mottet et al. (2017)

A tumour is staged by combining T, N and M classifications to come up with the description for all TNM combinations for each stage. See Table 2.3 below: -

Table 2.2 American Joint Committee on Cancer Prognostic Stage Grouping

STAGE	**T**	**N**	**M**
I	T1a, T1b or T1c	N0	M0
	T2a	N0	M0
	Any T1 or T2a	N0	M0
IIA	T1a, T1b or T1c	N0	M0
	T1a, T1b or T1c	N0	M0
	T2a	N0	M0
	T2b	N0	M0
	T2b	N0	M0
IIB	T2c	N0	M0
	Any T1 or T2	N0	M0
	Any T1 or T2	N0	M0
III	T3a or T3b	N0	M0
Iv	T4	N0	M0
	Any T	N1	M0
	Any T	Any N	M1

Source: Buyyounouski et al. (2017)

Prostate cancer is also commonly graded according to the Gleason score developed by Dr Donald Gleason in 1966 (Yarbro et al., 2018). The score describes how closely cancer cells resemble healthy tissues under a microscope. Grading refers to how aggressive the cancer is as viewed on microscope. The cancer cells are assigned a score based on how much they look like normal prostate tissue. Less aggressive tumours look like healthy tissues and are given a lower score. Aggressive tumours look different from healthy tissues, grow and spread to other body parts and are given a higher score. The Gleason score is the total derived from adding a score

assigned to an area with most predominant grade and an area with the second most predominant grade. The grading ranges from 1, being the least aggressive to 5, the most aggressive. It is reported that tumour grades 1 and 2 which give a Gleason score of 2 to 4 are rare and that Gleason score 2-5 are no longer assigned to prostate cancer patterns. Certain patterns of Gleason score 6 are currently assigned grade 7 which is regarded as low grade with better prognosis. (Yarbro et al., 2018; Kryvenko & Epstein, 2016). Scores are conventionally grouped as low grade (1-5), intermediate grade (6-7) and high grade (8-10). Increasingly, however, pathologists are reluctant to use Gleason grades of 1 or 2, making 3 effectively the lowest grade cancer score. A Gleason score of 3 + 3 is thus now regarded as low risk, 3 + 4 and 4 + 3 as intermediate risk, and 8–10 as high risk (Table 2.3). Cancer with a lower Gleason score grows slowly and is less likely to spread than that with a high-grade score. The Gleason score helps in planning for treatment as patients with high Gleason score may need treatment that is more intensive even if the cancer does not appear to have spread (Paterson et al., 2015; Kryvenko & Epstein, 2016; Mottet et al., 2016).

Table 2.3 Gleason scoring

GLEASON SCORE	DESCRIPTION
Gleason X	The Gleason score cannot be determined
Gleason score ≤6	The cells are well differentiated or low grade
Gleason 7	The cells are moderately differentiated or intermediate
Gleason 8, 9 or 10	The cells are poorly differentiated or are undifferentiated/high grade

Source: Epstein et al. (2016)

A new grading system has been validated and the old system modified, by the International Society of Urologic Pathologists. Grade 1 corresponds to Gleason score 6, grade 2 to Gleason score 3+4, grade 3 to Gleason 4+3, grade 4 to Gleason score 8 and grade 5 to Gleason score 9 or 10. This new grading system is yet to be divided into risk groups (Mottet et al., 2017).

2.3.7 Treatment of prostate cancer

Treatment options that are available for prostate cancer include active surveillance, watchful waiting, surgery, radiotherapy, chemotherapy, cryosurgery and hormonal

therapy (Mottet et al., 2017). Each option can be administered as a single therapy or combined with other options to maximise effectiveness. Due to the lack of randomised controlled clinical trials, there is currently no evidence of any drug being superior to the other (Heidenreich et al., 2011). Management of prostate cancer demands a multidisciplinary team to discuss, plan and execute appropriate treatment to strengthen standardisation, meet patient needs and avoid duplication and mismanagement of patients (Paterson et al., 2015). Different treatments have different side effects like sexual dysfunction which affect the QoL of individuals (Cuypers et al., 2018).

Treatment of prostate cancer depends on different factors like the age of the patient, the patients' health condition and preference, PSA levels, the Gleason score, stage of cancer and treatment complications. Management of prostate cancer is complex because of different treatment options available for specific cancer stages. The early stage of prostate cancer can be treated conservatively or with surgery and/or radiotherapy. Forty-five percent of prostate cancer patients with localised prostate cancer will benefit from deferred management. The two types of deferred management that aim to reduce over-treatment are active surveillance and watchful waiting. Hormonal therapy may be used along with surgery or radiotherapy for advanced early stage disease. Treatment often impacts a man's QoL due to short- or long-term side effects or complications (Mottet et al., 2017).

The more advanced disease is treated with hormonal therapy, chemotherapy, radiotherapy, and/or other treatments. Hormonal treatment may control advanced prostate cancer for long periods by shrinking the size or limiting the growth of cancer. An option that can be used for advanced prostate cancer that is no longer responding to hormones is a cancer vaccine known as Sipuleucel-T (Provenge). This treatment is designed to stimulate the patient's immune system to specifically attack prostate cancer cells (Gardner et al., 2012).

2.3.7.1 Active surveillance

Active surveillance is one of the management options for very-low-risk or low-risk localised prostate cancer (Yarbro et al., 2018). Since treatment for prostate cancer causes side effects like erectile dysfunction and urinary incontinence which affect the QoL, it is delayed, and the patient is observed closely until the appropriate time for curative treatment, with the aim of reducing over-treatment in patients with clinically confined, very-low-risk prostate cancer. Active surveillance is only proposed for

highly selected low-risk patients (Heidenreich et al., 2014; Mottet et al., 2016). A study by Klotz et al. (2010) revealed that men with low-risk prostate cancer, who were older than 70 years, had a median time of 7 years to disease progression and 35% had no signs of disease progression at 10 years. These findings have strengthened the use of active surveillance for low-risk prostate cancer. Dall'Era et al. (2012) reported that at 3.6 years, only 13% of patients had converted to treatment without evidence of disease progression. It was reported that for those with clinical evidence of disease progression, the median time to active treatment was 3 years (Yarbro et al., 2018). Recent studies recommend that individuals with low-risk prostate cancer and with a life expectancy of more than 10 years be initiated on active surveillance. The following criteria have been identified as eligibility criteria for patients on active surveillance (Heidenreich et al., 2014).

- Clinically confined prostate cancer (T1-T2)
- Gleason score equal or less than 6
- Three or fewer biopsies involved with cancer
- Equal or less than 50% of each biopsy involved with cancer
- PSA less than 10ng/ml.

The American Society of Clinical Oncology recommend the following monitoring schedule during active surveillance (Chen et al., 2016)

- A PSA test every 3-6 months
- DRE at least once a year
- Another biopsy within 6-12 months, then at least every 2-5 years

When the patient develops signs that the cancer is spreading during monitoring, treatment should be initiated (Yarbro et al., 2018).

2.3.7.2 Watchful waiting

Watchful waiting is a monitoring approach where patients undergo routine check-ups to evaluate pathologic changes with an aim for palliative treatment. Complications of active treatment are avoided even though it carries a risk for disease progression (Yarbro et al., 2018). The option is recommended for older men and those that have life-threatening conditions expected to live for less than 5 years. Routine testing of PSA, DRE and biopsy is not done, however, the patient is treated once complications or signs and symptoms develop. It is therefore very important for doctors to gather enough information pertaining to the patient's overall health status and illnesses to

determine whether active surveillance or watchful waiting is appropriate (Mottet et al., 2016).

2.3.7.3 Surgical intervention

Different types of surgical interventions are done depending on disease progression, however, the main procedure is radical prostatectomy. Radical prostatectomy involves the removal of the prostate gland with its accessory parts, which include ejaculatory ducts and seminal vesicles (Yarbro et al., 2018). A randomised trial has shown a survival benefit of radical prostatectomy for treatment of localised prostate cancer. The intervention has the risk of causing erectile dysfunction and incontinence, however, nerve-sparing surgery prevents such complications from occurring (Heidenreich et al., 2014).

2.3.7.4 Radiotherapy

Radiotherapy is a treatment that uses high energy rays to damage DNA and kill the cell. It is indicated in very-low-risk, low-risk and intermediate-risk patients for curative purposes. Radiotherapy has also been administered to patients who have not been willing to undergo surgery. Radiotherapy can be administered by either external x-ray beams from a linear accelerator or via brachytherapy where radiation sources are placed directly in the prostate gland.Radiotherapy is usually administered five days in a week for four to six weeks. In high-risk prostate cancer, external beam radiotherapy and brachytherapy have been recommended with or without hormonal therapy as a primary treatment to improve outcome. Combination of external beam radiotherapy and brachytherapy increases the dose of radiotherapy while minimising toxicity and reducing the risk for cancer recurrence and mortality. Some of the side effects that have been reported and affect the QoL include fatigue, urinary frequency, urinary incontinence and diarrhoea. A trial that combined the three (external beam radiotherapy, brachytherapy and hormonal therapy) had a better outcome with 9 years progress-free survival and reduced mortality rate of prostate cancer (Heidenreich et al., 2014; Yarbro et al., 2018)

2.3.7.5 Chemotherapy

Chemotherapy is a systemic treatment that inhibits the growth of cancer cells and is used in advanced stage of prostate cancer. The current drugs used in treating prostate cancer are docetaxel and cabazitaxel. A randomised trial proved that docetaxel had a survival advantage, reduced pain and improved HRQoL in

comparison to another prostate cancer drug called mitoxantrone (Yarbro et al., 2018). In one retrospective analysis that compared patients 75 years and older versus younger patients, docetaxel was well tolerated in both groups. Weekly docetaxel treatment caused less neutropenia, but a high rate of fatigue compared to 3-weekly regimen. In practice, healthy older patients are given the 3-weekly regimen, while weak patients are given weekly treatment (Droz et al., 2014).

2.3.7.6 Cryosurgery

Cryosurgery is a procedure that uses very cold temperatures to freeze lesions and induce cancer cell death. The technique induces death through cell dehydration, direct rupture and vascular stasis. It is recommended in organ-confined prostate cancer and with minimal spread beyond the prostate. It is necessary for patients to be well informed of inadequate data on long-term effects of the intervention. Erectile dysfunction is the common complication of the procedure. Other complications include tissue sloughing, haematuria, urinary retention, urine incontinence and pelvic pain (Heidenreich et al., 2014; Mottet et al., 2016).

2.3.7.7 Hormonal therapy

Hormonal therapy, also known as “androgen deprivation therapy” (ADT) or “androgen suppression therapy” reduces the production or action of the steroid hormone called testosterone, which is responsible for the growth and development of the prostate gland resulting in shrinkage of the prostate gland (Gomela, 2010). ADT suppresses testicular androgen secretion or inhibits the action of circulating androgens at the level of their receptors (Mottet et al., 2016). Different forms of ADT include luteinizing-hormone-releasing hormone (LHRH) agonists, LHRH antagonists, antiandrogens or oestrogens and surgical orchiectomy (Paterson et al., 2015).

Luteinising-hormone-releasing hormone (LHRH) agonists are mainly used to avoid the physical and psychological discomfort associated with surgical castration. Once the LHRH agonist is administered, it causes the release of large amounts of testosterone for a week resulting in an effect called “tumour flare”. Such an effect causes an increase in tumour growth resulting in bone pain for cancer that metastasised to bones and spinal cord compression, paralysis or pain and ureteric obstruction for a tumour affecting the spinal cord. In order to avoid tumour flare, an anti-androgen is given to the patient the first two weeks before administering the

LHRH agonist. Sustained high levels of testosterone resulting from administration of LHRH desensitise LHRH receptors leading to suppression of testosterone production. The use of these analogues is termed chemical or medical castration. Some of the LHRH analogues are leuprorelin, goserelin and triptorelin (Paterson et al., 2015; Mottet et al., 2016; Lepor & Shore, 2012).

LHRH antagonists like degarelix (Firmagon) immediately bind to LHRH receptors, leading to a rapid decrease in luteinising hormone, follicle stimulating hormone and testosterone levels without any flare. The practical shortcoming of these compounds is the lack of a long-acting depot formulation with only monthly formulations being available. As such degarelix is administered on a monthly basis, subcutaneously in the abdominal area. It is beneficial to administer these antagonists where tumour control does not require the raising of testosterone levels as in patients with bony metastasis or bladder neck obstruction. (Paterson et al., 2015; Mottet et al., 2016).

Anti-androgen drugs inhibit cancer growth by blocking the action of androgens without stopping their production. Anti-androgens are in tablet form and are taken orally on a daily basis. The drugs are usually given in combination form as “androgen combined blockade”. The combination is reported to be more effective than LHRH agonists and antagonists used alone. There are steroidal and nonsteroidal antiandrogens. Examples of steroidal anti-androgen include “-megestrol acetate and medroxyprogesterone acetate, while nilutamide, flutamide and bicalutamide (Casodex) are nonsteroidal antiandrogens” (Paterson et al., 2015; Mottet et al., 2016:52)

Bilateral subcapsular orchiectomy is a surgical procedure where the testicles, organs that produce most testosterone and dihydrotestosterone, are removed. The procedure, which can be performed under local anaesthesia is simple, cheap and uncomplicated. With the surgical procedure, castration is reached within 12 hours. The disadvantage of the procedure is that it cannot be reversed and results in body image alteration that can psychologically affect the patient negatively. However, the procedure has almost been replaced by medical castration (Paterson et al., 2015; Mottet et al., 2016).

2.3.7.8 CYP 17 inhibitor

It has been observed that despite administering LHRH agonists and antagonists,

androgens are produced by the cancer cells. CYP 17 inhibitor is a key enzyme in the production of androgen. Abiraterone acetate, administered in tablet form, blocks this enzyme from producing androgens. The drug is given together with other drugs such as prednisolone to avoid hypokalaemia, fluid retention and hypertension (Alex et al., 2016).

2.3.8 Prostate cancer management in South Africa

At the hospital where the study was conducted prostate cancer is managed according to guidelines by the South African Urology Foundation and European Association of Urology. Once investigations have been carried out and cancer is diagnosed, the staging, grading, risk stratification, patient's health status and other parameters will determine treatment. Risk stratification as indicated in Table 2.4, helps in planning appropriate treatment options for the patients.

ADT is the standard treatment for locally advanced or metastatic prostate cancer in order to delays disease progression and improves QoL. The choice of treatment depends on the patient's informed decision, availability of treatment and cost implications. Patients who are presenting with metastatic symptomatic disease are not suitable for curative treatment. First line treatment for locally advanced or metastatic prostate cancer is either medical or surgical ADT. Some men do not accept surgical ADT for body image reasons. LHRH agonist is one of the classes of medical ADTs that is currently being used.

Goserelin (10.8mg) is given to patients subcutaneously every 3 months up to two years before switching to another treatment modality or continuing with hormonal therapy. The drug is known to have adverse effects including hot flushes, erectile dysfunction, decreased libido, depression, mood changes, anxiety, irritability, fatigue, reduced muscle mass, and/or weight gain, breast enlargement (gynaecomastia), increased appetite, reduced concentration level and memory, genital shrinkage, anaemia, abnormal liver function, cardiovascular disease and diabetes mellitus (Coetzee et al., 2013; Mottet et al 2017).

Table 2.4 Treatment options according to classification

CLASSIFICATION	TREATMENT
Low-risk disease • T1-T2a • Gleason score 2-6 • PSA <10ng/ml	Life expectancy of <10 years - the patient is put on watchful waiting. Life expectancy of ≥10 years - active surveillance, EBRT, interstitial brachytherapy and radical prostatectomy.
Intermediate-risk disease • T2b-T2c clinical stage • Gleason score 7 (3+4) • PSA 10-20ng/ml	Life expectancy of <10 years - watchful waiting. Life expectancy ≥10 years –active surveillance, radical prostatectomy with lymph node dissection, EBRT, interstitial brachytherapy, or combinations of the above.
High-risk disease T3a or T3b and/or Gleason 7(4+3) to 10 and/or PSA ≥20ng/ml	Options include: – EBRT with ADT. Radical prostatectomy with lymph node dissection. ADT alone or trimodal therapy (brachytherapy, EBRT and ADT).

2.4 HEALTH-RELATED QUALITY OF LIFE

2.4.1 Defining Quality of Life

The term QoL was documented as early as the second half of the twentieth century, however little was known until the WHO adopted the definition of health in 1946. The WHO defined health as “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity” (Romero et al., 2013:2). In an attempt to describe QoL, the WHO included subjective and multi-dimensional features, as well as positive and negative dimensions (WHO, 1995). The subjective features included the individual’s perception of health status, which cannot be measured, and the multi-dimensional components included physical, psychological, social and spiritual dimensions. The positive dimensions included role functioning, contentment and mobility, while negative dimensions included negative feelings, dependence on medication, fatigue and pain. The WHO (1995) defined QoL as

“individuals’ perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns” (WHO, 1995:1405). The definition encompasses physical status, psychological state, level of independence, social relationships, individual beliefs, and relationship to environmental features, positive and negative components. According to Theofilou (2013), QoL depends on an individuals’ perception of the importance of aspects of QoL, such as emotional reactions to life occurrences, disposition, sense of life fulfilment and satisfaction with work and personal relationships.

The initiative of describing health and QoL led to the introduction of the concept of Health-Related Quality of Life (HRQoL) which is concerned with health aspects and general QoL. There are many definitions of HRQoL and authors include different domains of QoL. The WHO (1995) included physical-, mental-, emotional- and social functioning domains, while Cella et al. (Ding et al., 2012) include physical-, functional-, emotional- and social wellbeing and Dunn et al. (2013) add the social-, psychological- and physical domains. In addition, HRQoL is understood and viewed differently in different cultures (Kagawa-Singer, 2010). Focusing only on biomedical measures excludes the patient’s perspective in assessing overall QoL. The inclusion of psychosocial issues and patients’ perspectives in evaluating treatment outcomes is considered in determining QoL (Oliver & Greenberg, 2009).

O’Connor’s definition of HRQoL (Theofilou, 2013) focuses on an individual’s satisfaction with aspects of life while being independent and in control of the disease process. Lin et al., (2013) in their definition of HRQoL, include individuals’ perceptions of and reactions to their health status and include aspects such as physical, functional, emotional, and mental well-being, as well as non-health-related elements, such as employment, family and friends. The definitions agree on the subjectivity and multi-dimensionality of HRQoL, encompassing health, disease and health outcomes (Romero et al., 2013).

2.4.2 HRQoL instruments

The HRQoL should be considered when helping patients make decisions regarding treatment. Different instruments with multidimensional measurements have been developed to measure HRQoL. These instruments are classified as either generic,

disease-specific or symptom-specific (Lin et al., 2013).
The Generic instruments measure general aspects of QoL across different groups of patients and different diseases. An example of a generic instrument is the Medical Outcomes Short Form 36 item Health Survey (Zeng et al., 2010). Disease-specific instruments measure the effects of a particular disease such as cancer or specific cancers on an individual and can assist in making clinical decisions. These instruments cannot provide information to help compare interventions across different diseases. Disease-specific instruments include the 27-item Functional Assessment of Cancer Therapy (FACT-G) scale, the 12 item-prostate cancer-specific (FACT-P) scale, the International Prostate Symptoms Score (IPSS), the University of California-Los Angeles Prostate Cancer Index (UCLA-PCI) and the Expanded Prostate Cancer Index Composite (EPIC) (Lin et al., 2013; Schmidt et al., 2014).

Symptom-specific instruments are helpful to determine the effect of cancer and treatment on the person's QoL. Instruments like the McGill Pain Questionnaire and the Karnofsky Performance Index can be used to determine a patient's ability to take care of himself (Ngamkham et al., 2012; Atkinson et al., 2015)

2.4.3 Instruments for measuring HRQoL in prostate cancer

Hamoen et al. (2015) reported on commonly used HRQoL instruments and categorised them as generic questionnaires, cancer-specific questionnaires and prostate cancer-specific questionnaires. The most frequently used generic questionnaires are the European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire Core 30 (EORTC QLQ-C30), Functional Assessment of Cancer Therapy-General (FACT-G) and the 36-item Short Form Health Survey (SF-36) (Theofilou, 2013). Other commonly used questionnaires include Ferrans and Powers Quality of Life Index (QLI), World Health Organisation Quality of Life (WHOQOL-100), Padilla Quality of Life Index (QLI), 20-Item Short Form Health Survey (SF-20), and Satisfaction with Life Scale (SWLS). Other identified cancer-specific questionnaires are the Functional Living Index-Cancer (FLIC), Selby's Quality of Life Index (QLI), Cleary's Quality of Life Index (QLI) and Cancer Rehabilitation Evaluation System (CARES-SF) (Hamoen et al., 2015).

The prostate cancer-specific questionnaires are the UCLA-PCI, EPIC, Functional Assessment of Cancer Therapy-Prostate (FACT-P), EORTC QLQ Prostate Cancer-

Specific PR25, Patient-Oriented Prostate Utility Scale (PORPUS)-Psychometric and Prostate Cancer-Specific Questionnaire 94. Each questionnaire has items ranging from 5 in the SWLS to 100 in the WHOQOL-100. Likert scales with a list of options are used except for two questionnaires that use visual analogue scales (Hamoen et al., 2015).

The EORTC Quality of Life Group introduced the concept of modular HRQoL in oncology, based on a core cancer questionnaire and cancer-specific modules covering specific symptoms, treatment side effects and functional problems. The EORTC was the first to publish guidelines for the development of modules that have set international standards and been used widely by researchers. EORTC QLQ-C30 has been validated in multiple European countries and published in 1993 and user agreements have been signed in more than 9,000 clinical trials. The instrument has been translated and validated in over 100 languages and used in more than 3,000 studies globally. The questionnaire is supplemented by a disease-specific module, the prostate-specific-25 questionnaire which has also been used in several clinical trials (Aaronson et al., 1993).

The EORTC QLQ-C30 (version 1) was used for all patients. The questionnaire is designed to be self-administered by the patient. It consists of 30 questions, 24 of which are organised into nine scales: physical, role, emotional, cognitive and social functioning, global health status/quality of life, fatigue, nausea and vomiting, and pain. The response categories for questions 1-28 are “not at all”, “a little”, “quite a bit”, “very much”. For questions 29 and 30 the responses have a scale of 1-7 ranging from very poor as 1 to 7 as excellent (Fayers et al., 2010).

The prostate-specific-25 questionnaire was developed to assess HRQoL in men undergoing treatment or who have recently completed treatment for prostate cancer. The instrument was used in studies investigating its psychometric properties and was internationally validated in 2008. The prostate-specific questionnaire demonstrated acceptable psychometric properties and clinical validity (Van Andel et al., 2008).

The EORTC QLQ-PR25 comprises 20 symptom questions and five conditional questions. The questionnaire has five multi-item subscales which measure urinary symptoms, bowel symptoms, hormone treatment-related symptoms, sexual activity and sexual functioning. The five conditional questions are based on being sexually

active and one on use of incontinence aids. The first 16 questions assess symptoms during the past week while the remaining five assess symptoms during the previous four weeks. The responses are also categorised as “not at all”, “a little”, “quite a bit”, “very much” (Van Andel et al., 2008).

2.4.4 The effect of prostate cancer and treatment on HRQoL

Treatment for cancer has both short- and long-term effects on patients’ health status which can result in difficulties to fulfil family roles, ability to work or participate in social activities. The consequences could be physical, emotional and psychological. Prostate cancer and hormonal therapy have been reported to impact on the HRQoL of patients in various ways. Van Andel and Kurth (2003), in a randomised study on the impact of ADT on HRQoL in asymptomatic men with lymph node positive prostate cancer, found that patients reported significantly worse sexual, emotional and physical functions. The patients also complained of emotional distress and hot flushes with worse overall HRQoL. Upon follow up, the patients had poor physical function and fatigue. Hot flushes have been reported in an open-label randomised multicentre study (Schulman et al., 2015) and in a prospective observational study (Ueno et al., 2018). While Ueno et al. also reported low sexual scores that did not return to baseline, Chien et al. (2017), in a prospective study of newly diagnosed patients on ADT, reported an initial small decline that progressed and showed no recovery up to 24 months and resulted in very poor sexual function. These findings were confirmed by Huang et al. (2010). Brassell et al. (2013) added the effect of a low income on QoL. Sartor et al. (2015) conducted interviews with patients with metastatic prostate cancer to understand the impact of disease and treatment on their lives. The patients reported a loss of libido, erectile dysfunction or cessation of sexual activity, which caused depression and marital problems. While sexual activity was reported as a concern to some, it was not to others. A decline in bowel scores until 24 months was reported by both Chien et al. (2017) and Huang et al. (2010), however, Chien et al. reported scores that reached a nadir at three to six months after treatment.

Alibhai et al. (2015), in a study on the long-term impact of androgen-deprivation therapy on physical function and QoL over 36 months, reported a severe decline in physical function and QoL over the study period. Physical- and social functioning domains of HRQoL were reported to be severely affected in patients who received

hormonal therapy, as patients presented with severe fatigue, pain, dyspnoea, loss of appetite and severe sexual dysfunction (Drummond et al., 2015). Fatigue was reported to be the major cause of poor HRQoL because it limits an individual's functional ability (Farkkila et al., 2014).

Prostate cancer patients are affected in various ways that compromise their HRQoL. A review of the literature on cancer nursing revealed that no study on this topic has been done in South Africa and that the effect of hormonal therapy on the HRQoL of patients is not known (Maree & Schmollgruber, 2014). This study addresses the need to investigate and describe the effects of hormonal therapy on prostate cancer patients in South Africa, who often present with advanced disease (Le Roux et al., 2015).

2.5 SUMMARY

The chapter provided information on cancer statistics globally and in Africa, prostate cancer statistics in Africa, prostate cancer, risk factors, screening and early detection, diagnosis, staging and grading, treatment of prostate cancer, management of prostate cancer in South Africa and relevance to HRQoL. Chapter three discussed the research design and methods.

CHAPTER THREE

RESEARCH DESIGN AND METHODS

3.1 INTRODUCTION

Chapter two presented the literature review for the study. Chapter three will describe the research design and methods, including the research setting, sampling technique, data collection, data analysis, validity and reliability and ethical considerations.

3.2 RESEARCH DESIGN

A cross-sectional study design was selected for the study. Polit and Beck (2014) define a cross-sectional design as a way of gathering data at one point or within a short period of time. A cross-sectional study is a descriptive study of an event at a specific point in time. The advantage of the design is that it allows the researcher to examine the relationship between disease and other variables. The design is also easy to manage and requires few resources such as time and finances. A cross-sectional design was appropriate for the study as the researcher described HRQoL of men treated with hormonal therapy for prostate cancer at a specific point in time. The disadvantage of a cross-sectional study is that it is less persuasive in nature and makes inference over time difficult, compared to for example longitudinal studies (Polit & Beck, 2014).

3.3 RESEARCH METHODS

Research methods are defined as processes undertaken to collect and analyse data to answer a research question (Polit & Beck, 2014). The research methods discussed in the report included the research setting, population, sampling and recruitment, data collection method and data collection instruments, data management and analysis and research validity and reliability.

3.3.1 Research setting

The research setting is defined as an environment where data collection takes place while maintaining the same conditions (Polit & Beck, 2014). The setting can either be natural or controlled. The research setting for this study was an academic hospital in the Gauteng Province, which is also the main teaching hospital for a university. The

hospital is an accredited central hospital with 1088 beds and provides services to patients across Gauteng province and neighbouring provinces. The hospital offers a full range of tertiary, secondary and highly specialised services and operates as a referral facility for a number of facilities in its referral chain. The hospital offers both medical and radiation oncology (South African Government News Agency, 2017). Men with urological cancer, who receive hormonal therapy are treated at the Urology Department whilst those who need radiotherapy are treated at the Radiation Oncology Department.

3.3.2 Population, sampling and recruitment

A study population refers to a specific group of people that the researcher wishes to study. The target population is defined as entire population of interest to the researcher (Polit & Beck, 2014).The target population for the study was men receiving hormonal therapy for prostate cancer. Accessible population is defined as part of the population of interest to the researcher that is accessible (Polit & Beck, 2014). The accessible population for the study was patients treated with hormonal therapy for prostate cancer at the site of the study during the time of data collection.

The inclusion criteria for the study were: men aged 18 years and older, willing to participate, able to understand Basic English and receiving hormonal therapy for prostate cancer at the hospital where the study was conducted during the period of data collection.

A calculated sample size was used. The sample size was calculated using the Raosoft calculator (Raosoft Inc., 2004) at a confidence interval of 95%, margin error of 5%, response distribution of 50% and population size of 158 (N=158) which resulted in a sample of 113 (n=113). Convenience sampling, which involves the selection of research participants that are available to the researcher at the point of study, was used to select the sample (Polit & Beck, 2014). Patients waiting for their scheduled medical appointments were approached and recruited; 115 patients were recruited but two patients refused to participate. Recruitment continued until the sample size realised and the data were collected between October and December 2017.

3.3.3 Data collection

Data were collected using structured interviews. A structured interview is an

approach that uses the same questions for all respondents and has a list of responses from which respondents choose the most appropriate. Structured interviews are easy to administer and analyse and more control is possible over the data collection than when the questionnaires are self-administered. The disadvantage of a structured interview is that the data lack richness that comes with an exploration of responses. The method was chosen to allow the researcher to explain the questions to the respondents and be able to collect data within a short period of time (Brink, 2016; Polit & Beck, 2014).

Three data collection instruments were used. A data collection instrument is a formal written document used to collect and record information (Polit & Beck, 2014). A simple general information questionnaire was used to collect information including age, marital status, level of education, main source of income, occupation, socio-cultural group, reported stage of the disease and time on treatment (Addendum 2). The questionnaire was developed after literature review and with the help of two supervisors. The European Organization for Research and Treatment of Cancer Quality of Life Questionnaire Core-30 (EORTC QLQ-C30) (Addendum 3) and Prostate-Specific 25 item (EORTC QLQ-PR25) questionnaires (Addendum 4) were used to collect the data pertaining to HRQOL. Permission to use the instruments was obtained (Addendum 1).

The EORTC QLQ-C30 instrument incorporates five functional scales (physical, role, emotional, cognitive, and social functions), three symptom scales (fatigue, pain, nausea and vomiting) as well as global health status. The instrument also investigates additional symptoms commonly reported by cancer patients (dyspnoea, loss of appetite, insomnia, constipation and diarrhoea, sleep disturbance, as well as financial difficulties). Each item is scored from 1 to 4 (1-, “not at all”; 2- “a little”; 3-, “quite a bit”; and 4-, “very much”), except for items in the overall health and overall QoL scale, which range from 1 “very poor” to 7 “excellent” (Aaronson et al., 1993).

The prostate-specific module EORTC QLQ-PR25 developed to measure disease-specific HRQoL is a 25-item questionnaire designed for treatment side effects among patients with localized and metastatic prostate cancer. It includes an assessment of urinary symptoms (nine items), bowel symptoms (four items), treatment-related symptoms (six items), and sexual functioning (six items). This questionnaire demonstrated strong validity and reliability (Van Andel, 2008).

The planning of data collection was as follows:

- Once ethical clearance and permission from the hospital had been obtained, the clinical Heads of Departments of Radiation Oncology and Urology, as well as the Nursing Unit Managers, were approached and their support obtained.
- Data collection took place on normal clinic days while patients were waiting for a consultation with the doctors.
- After volunteering for the study, respondents were approached and taken aside for the interviews while their positions in the queue were maintained as far as possible. The clinics had a separate room that was allocated for interviews to provide privacy.
- Only the interviewer and the respondent were present in the room during interviews. The patients' information sheet (Addendum 6) was read to the patients and those who agreed to take part in the study were given the consent form (Addendum 7) to sign.
- The interviews took 15 to 20 minutes each. An arrangement for counselling was made in case of distress as a result of the questions. However, none of the respondents asked for counselling during the interviews.

3.3.4 Data management and analysis

The completed questionnaires were placed in a sealed box. Each questionnaire was allotted a number on a sequential basis and entered onto an excel spreadsheet. The data were cleaned after which data analysis was done using the STATA package. The level of significance was set at $p < 0.05$. Descriptive statistics were used to describe the health characteristics of the sample with means, standard deviations, frequency distributions and percentages. The Kruskal-Wallis H test was used to compare the mean responses of different variables (Voerman et al., 2006).

All HRQoL scores were calculated using the EORTC scoring procedure. The HRQoL raw scores were standardised to linear transformation ranging from 0-100 to ease presentation and interpretation of data. All scales and single item measures had the lowest score of 0 and the highest score of 100. A higher score in the functional scales indicated better functioning status while in the symptom scales indicated severe health problems. A higher score under global health status indicated a better QoL. Functional scales comprised of physical-, role-, emotional-, cognitive- and social

functioning. The EORTC scoring procedure for functional and symptom scales and global health status are as below: -

Raw score = *RS* = (*I1+I2+…In*)/*n*

Linear transformation: - Applying the linear transformation to 0-100 to obtain the score *S.*

Functional scales: $S = \{1-(RS-1)/range\} *100$

Symptom scales/items: $S = \{(RS -1)/range\} *100$

Global health status / QoL: $S = \{(RS -1)/range\} *100$

3.3.5 Validity and reliability

Validity is the degree to which the instrument accurately measures what is being studied. Reliability refers to the ability of the instrument to produce the same results if reused by another researcher (Polit & Beck, 2014). The respondents were asked the same questions with a list of possible answers to choose from and clarity was given where needed. The researcher ensured that the respondents understood the questions before responding and circled the responses given by the respondents.

The internal consistency of the EORTC QLQ-C30 and EORTC QLQ-PR25 were determined by the Cronbach's alpha coefficients. Internal consistency gives an estimation of dependability of the measuring instrument (Aaronson et al., 1993). Cronbach's alpha reliability coefficients of the EORTC QLQ-C30 varied from 0.62 for the nausea subscale to 0.87 for the general HRQoL. In a study to evaluate EORTC QLQ-PR 25, reliability was acceptable with Cronbach's alpha of >0.7 for urinary problems, sexual activity and sexual function (O'Leary et al., 2015). The instrument discriminated well between clinically distinct groups and those defined by primary treatment and stage at diagnosis. The sexual activity and sexual functioning subscales in the EORTC QLQ-PR25 showed good discriminant validity compared to QLQ-30. Some subscales showed poor validity (bowel 0.67 and hormonal treatment-related symptoms 0.59). However, the EORTC-PR25 scales constitute an inventory of symptoms rather than the measurement of a theoretical construct. Therefore, a low Crohnbach's alpha does not necessarily mean that the measurement of symptoms is inadequate (Van Andel et al., 2008; O'Leary, 2015). These instruments have been

tested in multicultural settings and therefore deemed reliable for use in this population (Schmidt et al., 2014).

3.4 ETHICAL CONSIDERATIONS

The study applied the ethical principles guided by the Belmont Report (Polit & Beck, 2014), namely beneficence, respect for human dignity and justice to protect the study respondents. The following steps were followed:

- The research proposal was presented to the Department of Nursing Education and the University Postgraduate Committee for peer review. Permission was granted to submit the proposal for Ethics approval.

- The proposal was submitted to the University of Witwatersrand Human Ethics Committee and ethical clearance was obtained (Reference No.: M170567) (Addendum 8).

- Permission to conduct the study was obtained from the Gauteng Department of Health and The Chief Executive Officer of the Academic Hospital (Addendum 9)

- Permission was obtained from EORTC to use the validated tool developed by the institution (Addendum 1).

- The researcher applied the principle of beneficence, which refers to the duty to minimize harm and maximize benefits. In the study, there was no foreseen physical, emotional, social or financial harm resulting from participation in the study. The respondents were observed for any signs of distress. An opportunity was provided for the respondents to ask questions and express their feelings. None of the respondents had any emotional discomfort resulting from the nature of the questions nor demanded counselling session.

- Respect for human dignity which involves the right to self-determination and the right to full disclosure was upheld. Self-determination was observed through making the respondents aware of voluntary participation in the study without risking health care withdrawal, the right to ask questions, the right to refuse to disclose or give information, right to withdraw from the study at any time. The right to full disclosure involves patients' right to an informed

decision. An information leaflet (Addendum 6) describing the nature of the study was given and read out to the patients. Thereafter informed consent (Addendum 7) was obtained from those patients who were willing to participate in the study. None of the respondents was disadvantaged on the basis of personal beliefs, habits, culture or lifestyle.

- Justice involves the right to fair treatment and the right to privacy. All respondents who met the criteria were approached to participate in the study and none of those that refused was disadvantaged in the care received. The study interviews were conducted in a private room to ensure confidentiality. Anonymity was adhered to by ensuring that questionnaires were not linked to any specific respondent. The completed questionnaires were kept in a safe lockable cupboard and were only accessible to the researcher, supervisor and the University of Witwatersrand Ethics Committee. Data collected were used for the purpose of this study only. The research report provides results only and no names of individuals nor of institutions appeared in the report. The researcher treated all information with the strictest confidentiality without divulging any patient's information to any other person or institution.

3.5 SUMMARY

Chapter three presented the research methods, which included research design, purpose and objective, research setting, population, sampling and recruitment, data collection, instruments, data management and analysis, research validity and reliability and ethical considerations. Chapter four presented the results of the study.

CHAPTER FOUR

RESULTS OF THE STUDY

4.1 INTRODUCTION

Chapter three discussed the research design and methods. Chapter four presents the results of the study.

4.2 GENERAL INFORMATION

The study had 113 respondents (n=113). The respondents' ages ranged from 52 to 96 years, with a mean of 68.8 years and ±SD of ±7.3. The largest proportion of the respondents were over 70 years (46%; n=52). Most of the respondents were married (62.8%; n=71) and 29.2% (n=33) were separated/divorced/widowed. More than a third, (37.2%; n=42) attended grade 8-10, while 5.3% (n=6) never attended school. Pensioners comprised most of the respondents (80.5%; n=91) and 74.3% (n=84) relied on social grants as their main source of income. Most of the respondents (96%; n=105) had a monthly income of more than the breadline amount of R779.00 (Statistics South Africa, 2015). Considering the social cultural background of the respondents, the IsiZulu comprised a larger proportion (22%; n=25) than the rest. Table 4.1 summarises the general information regarding the respondents.

Table 4.1 General information (n=113)

Age (years)	**n**	**%**
50-59	10	8.8
60-69	51	45.1
≥70	52	46
Marital Status		
Never married	4	3.5
Married	71	62.8
Living with partner	5	4.4
Separated/Divorced/Widower	33	29.2
Educational level		
Never attended school	6	5.3
Grade 1-7	25	22.1
Grade 8-10	42	37.2
Grade 11-12	28	24.8

Tertiary	12	10.6
Employment status		
Pensioner	91	80.5
Skilled	16	14.2
Unskilled	3	2.7
Unemployed	3	2.7
Social cultural group		
IsiZulu	25	22.1
Setswana	21	18.6
Sesotho	12	10.6
IsiXhosa	9	8.0
Pedi	7	6.2
Coloured	7	6.2
Venda	5	4.4
Tsonga	5	4.4
Ndebele	4	3.5
English	3	2.7
Shangaan	3	2.7
Chewa	3	2.7
Afrikaans	2	1.8
Indian	2	1.8
Other (Swazi, Chinese, Bini, Hindu, Lithuanian)	5	4.4
Main source of income		
No income	3	2.7
Self-employed	7	6.2
Employed	10	8.9
Social grant	84	74.3
Other	9	8.0
Monthly income*		
<R779.00	5	4.6
>R779.00	105	95.5

***** South African breadline

4.3 REPORTED STAGE OF DISEASE AND TIME ON TREATMENT

The majority of the respondents (93.8%; n=106) did not know the stage of their disease. Most of the respondents (54%; n=61) were between 3-12 months of treatment. Table 4.2 presents a summary of the stage of disease and period on treatment.

Table 4.2 Reported stage of disease and time on treatment (n=113)

Reported stage of disease		
	n	**%**
Stage I	2	1.8
Stage II	2	1.8
Stage III	0	0
Stage IV	3	2.7
Stage not known	106	93.8
Time on treatment		
3-12 months	61	54
15 – 24 months	52	46

4.4 OVERALL HEALTH, QUALITY OF LIFE AND GLOBAL HEALTH STATUS

The scores for overall health and QoL were used to calculate global health status score. One respondent was not able to rate his overall health and QoL and was excluded from Tables 4.3 and 4.4 and Figures 4.1 and 4.2 (n=112). When calculating the respondents' global health status, quality of life and overall health, overall health had the highest mean score (*M*=61; SD±19.1), followed by global health status (*M*=60.5; SD±18.8) while QoL had the lowest (*M*=60; SD±24.2). When comparing time on treatment with these variables, the Kruskal-Wallis H test did not find statistically significant differences among the variables. The summary is presented in Figure 4.1 and tabulated in Table 4.3 which includes the standard deviations.

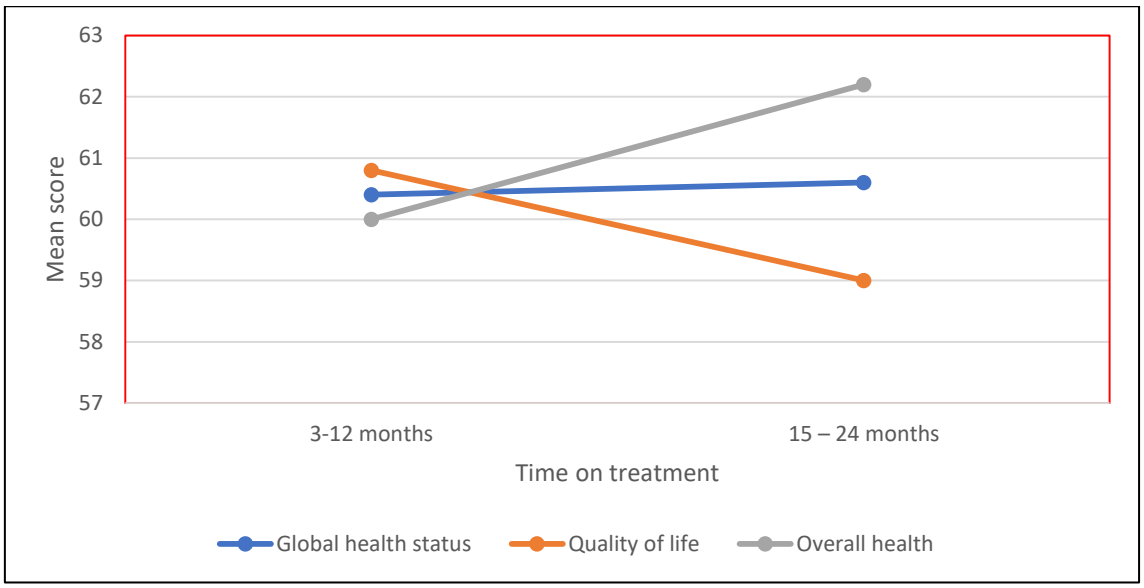

Figure 4.1 Overall health, quality of life and global health status according to time on treatment (n=112)

Table 4.3 Overall health, quality of life and global health status according to time on treatment (n=112)

Variables	3-12 months (n=60)		15-24 months (n=52)		*P* value
	Mean	±SD	Mean	±SD	
Global health status	60.4	18	60.6	19.7	0.760
Quality of life	60.8	23.7	59	25	0.632
Overall health	60	19.5	62.2	18.7	0.175

Key= *statistically significant, p≤0.05

When cross-tabulating age with global health status, QoL and overall health, global health status and QoL had the highest mean score in the age group 50 to 59 years. However, Kruskal-Wallis H tests did not find any statistically significant differences among the variables. The summary is presented in Figure 4.2 and Table 4.4. Table 4.4 also presents the standard deviations.

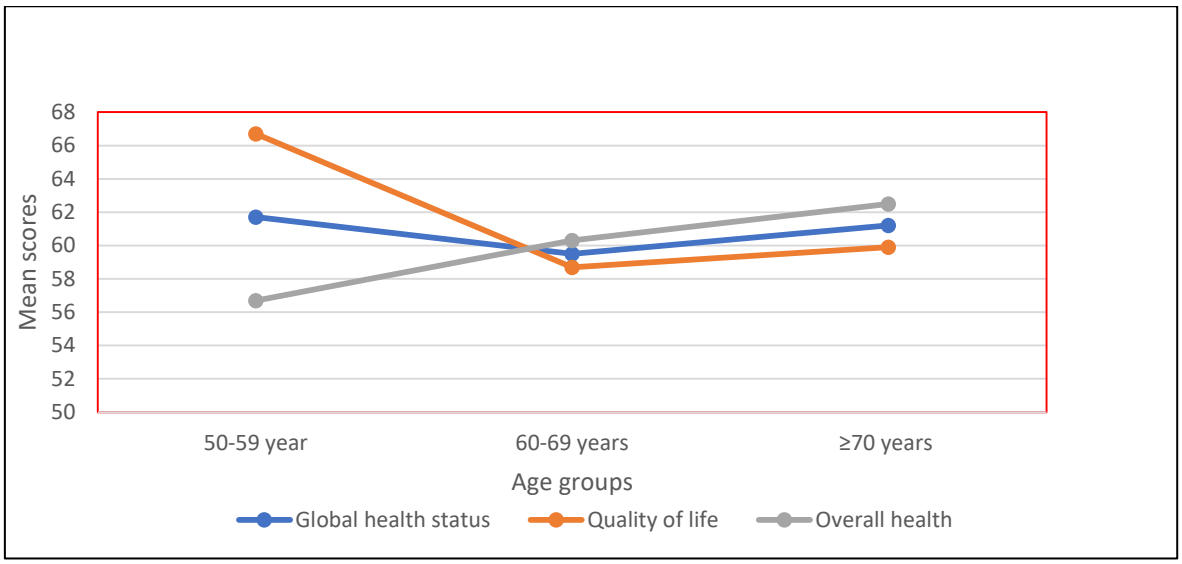

Figure 4.2 Overall health, quality of life and global health status according to age (n=112)

Table 4.4 Overall health, quality of life and global health status according to age (n=112)

Variables	50-59 years (n=10)		60-69 years (n=51		≥70 years (n=52)		*P* value
	Mean	±SD	Mean	±SD	Mean	±SD	
Global health status	61.7	18.9	59.5	19.8	61.2	18	0.928
Quality of life	66.7	28.3	58.7	25.5	59.9	22.4	0.748
Overall health	56.7	16.1	60.3	20.2	62.5	18.6	0.546

Key= *statistically significant, p≤0.05

4.5 FUNCTIONING

When calculating the mean scores for the different domains: physical-, role-, emotional-, cognitive- and social functioning, physical functioning had the highest score (*M*=86.4; SD±20.5) while social functioning had the lowest (*M*=72.6; SD±30.8). The summary is provided in Table 4.5.

Table 4.5 Functioning according to the various domains (n=113)

Domains	Mean	±SD
Physical	86.4	20.5
Role	82.9	28.8
Emotional	85	19.2
Cognitive	82.3	24
Social	72.6	30.8

When comparing time on treatment with the different domains, all except role functioning had a higher score between 3-12 months of treatment. However, the Kruskal-Wallis H test showed no statistically significant difference between the domains and time on treatment. Figure 4.3 and Table 4.6 summarise the results.

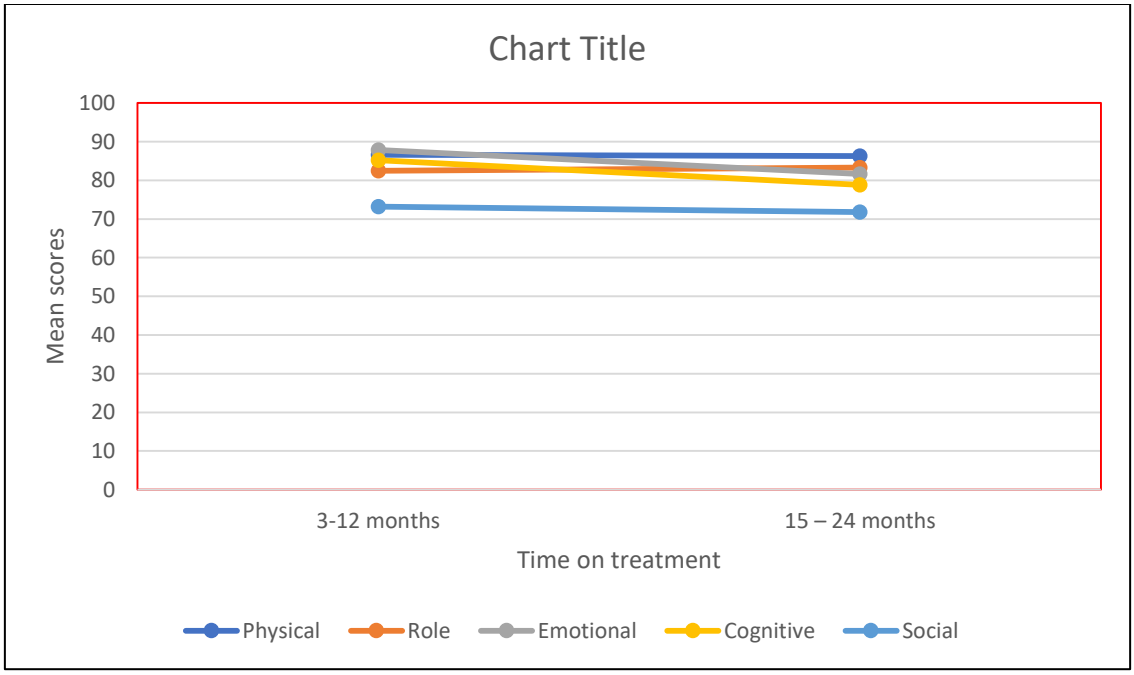

Figure 4.3 Functioning according to time on treatment (n=113)

Table 4.6 Functioning according to time on treatment (n=113)

Domains	3-12 months		15-24 months		*P* value
	Mean	±SD	Mean	±SD	
Physical	86.6	19.3	86.3	21.9	0.907
Role	82.5	29.7	83.3	28	0.978
Emotional	87.8	15.2	81.6	22.6	0.210
Cognitive	85.2	21.1	78.8	26.8	0.262
Social	73.2	30.5	71.8	31.4	0.712

Key= *statistically significant, p≤0.05

When cross-tabulating age with the different domains, physical, role and cognitive scores had lowest mean score in men aged 70 years and older. The Kruskal-Wallis H test showed no statistically significant difference among the variables. Summaries are presented in Figure 4.4 and Table 4.7 which also provides the standard deviation.

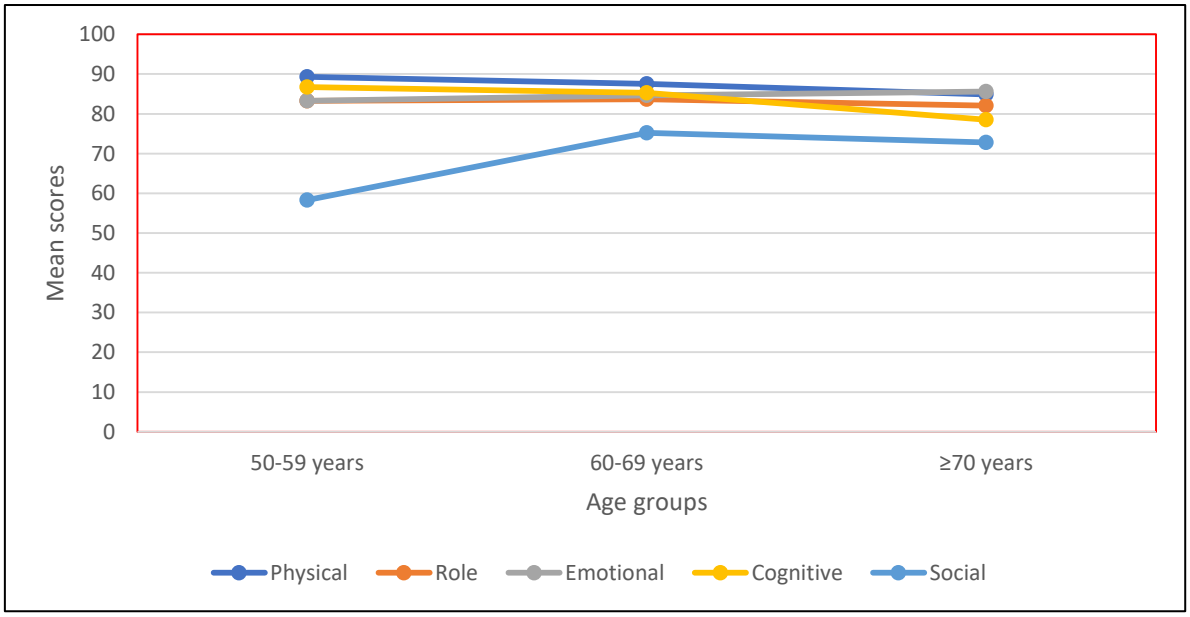

Figure 4.4 Functioning according to age (n=113)

Table 4.7 Functioning according to age (n=113)

Domains	50-59 years (n=10)		60-69 years (n=51		≥70 years (n=52)		*P* value
	Mean	±SD	Mean	±SD	Mean	±SD	
Physical	89.3	16.1	87.5	19.3	84.9	22.4	0.625
Role	83.3	31.4	83.7	27.8	82.1	29.9	0.933
Emotional	83.3	14.2	84.6	18.2	85.6	21.1	0.589
Cognitive	86.7	18.9	85.3	24.4	78.5	24.3	0.168
Social	58.3	32.6	75.2	25	72.8	35.1	0.287

Key= *statistically significant, p≤0.05

4.6 GENERAL SYMPTOMS

When calculating the mean scores for the general symptoms, insomnia scored the highest (*M*=24.5; SD±39.6), followed by fatigue (*M*=23.4; SD ±28.5), financial difficulties (*M*=23; SD ±36.8) and pain (*M*=21.7; SD ±28.9). Nausea and vomiting had the lowest score. The summary is provided in Table 4.8.

Table 4.8 General symptoms for the total group (n=113)

General symptoms	Mean	±SD
Fatigue	23.4	28.5
Pain	21.7	28.9
Nausea and vomiting	1.7	10.5
Loss of appetite	8.0	22.8
Dyspnoea	9.7	22.1
Insomnia	24.5	39.6
Constipation	18.9	35
Diarrhoea	2.4	11.5
Financial problems	23	36.8

When comparing time on treatment with the general symptoms, fatigue, pain, insomnia and constipation had higher mean score between 15-24 months of treatment. Nausea and vomiting was only present between 15-24 months of treatment (*M*=1.8; SD ±10.5) and Kruskal-Wallis H tests found a statistically significant relationship between time on treatment and nausea and vomiting (*p*=0.014). Table 4.9 summarises the results.

Table 4.9 General symptoms according to time on treatment (n=113)

General symptoms	3-12 months (n=61)		15-24 months (n=52)		*P* value
	Mean	±SD	Mean	±SD	
Fatigue	20.4	25.7	26.9	31.3	0.239
Pain	18.9	26.1	25	31.7	0.362
Nausea & vomiting	0	0	1.8	10.5	0.014*
Loss of appetite	8.2	24.1	7.7	21.5	0.813
Dyspnoea	10.9	21.7	8.3	22.7	0.329
Insomnia	20.2	35.6	29.5	43.6	0.291
Constipation	15.8	31.4	22.4	38.9	0.573
Diarrhoea	2.7	14	1.9	7.8	0.859
Financial problems	26.2	38.1	19.2	35.1	0.304

Key= *statistically significant, p≤0.05

When cross tabulating age with the various general symptoms, only men 60 years and older reported diarrhoea, while nausea and vomiting was experienced by men 70 years and older. Loss of appetite, dyspnoea, insomnia and constipation had the highest score in men aged 70 years and older. The Kruskal-Wallis H test found a statistically significant relationship between age groups and nausea and vomiting. The summaries are provided in Table 4.10.

Table 4.10 General symptoms according to age (n=113)

Symptoms	50-59 years (n=10)		60-69 years (n=51		≥70 years (n=52)		*P* value
	Mean	±SD	Mean	±SD	Mean	±SD	
Fatigue	27.8	34.4	20.9	26.4	25	29.5	0.791
Pain	26.7	26.3	21.9	28.6	20.5	30	0.513
Nausea & vomiting	0	0	0	0	3.8	15.3	0.048*
Loss of appetite	6.7	21.1	6.5	23.1	9.6	23.2	0.408
Dyspnoea	3.3	10.5	9.8	20.3	10.9	25.3	0.684
Insomnia	26.7	37.8	16.3	34.9	32.1	43.3	0.08
Constipation	3.3	10.5	19	34.2	21.8	38.4	0.419
Diarrhoea	0	0	3.9	15.8	1.3	6.5	0.485
Financial problems	36.7	48.3	24.8	35.8	18.6	35.2	0.353

Key= *statistically significant, p≤0.05

4.7 PROSTATE SPECIFIC PROBLEMS

When calculating functioning scores for prostate specific problems, sexual activity and sexual functioning, sexual activity had a higher mean score (*M*=78.5; SD±26.2) while sexual functioning had a lower score (*M*=51.7; SD±26.2). When calculating prostate specific symptoms, urinary problems, bowel problems and hormonal treatment-related symptoms, the latter had the highest score (*M*=14; SD±12.4) while bowel problems had the lowest (*M*=5.2; SD±11.6). The results are presented in Table 4.11.

Table 4.11 Prostate specific problems for the total group (n=113)

Prostate specific problems	**Mean**	**±SD**
Functioning scores		
Sexual activity	78.5	26.2
Sexual function	51.7	26.2
Symptom scores		
Urinary problems	11.9	17.5
Bowel problems	5.2	11.6
Hormonal treatment-related symptoms	14	12.4

When comparing time on treatment with the various prostate specific problems, sexual functioning, urinary problems, bowel problems and hormonal treatment-related symptoms had the higher mean score between 15-24 months of treatment. However, the Kruskal-Wallis H tests showed no statistically significant difference between the functioning, various symptoms and time on treatment. Table 4.12 provides the summary.

Table 4.12 Prostate specific problems according to time on treatment (n=113)

Prostate specific problems	3-12 months (n=61)		15-24 months (n=52)		*P* value
	Mean	±SD	Mean	±SD	
Functioning					
Sexual activity	79.2	26.5	77.6	26.2	0.641
Sexual functioning#	47.2	25.3	59.3	27.5	0.311
Symptom scores					
Urinary problems	9.6	17.1	14.7	17.6	0.053
Bowel problems	3.8	9.2	6.7	13.9	0.278
Hormonal treatment-related symptoms	12.4	12.1	15.9	12.6	0.104

Key: *statistically significant, p≤0.05

NB: # only 24 respondents answered the questions as it only pertained to those who were sexually active

When cross-tabulating age with prostate specific problems, sexual activity, sexual functioning and urinary problems had a highest score in men aged 70 years and older. The Kruskal-Wallis H tests did not find statistically significant difference between age groups and the prostate specific problems. Table 4.13 provides the summary.

Table 4.13 Prostate specific problems according to age (n=113)

Prostate specific problems	50-59 years (n=10)		60-69 years (n=51		≥70 years (n=52)		*P* value
	Mean	±SD	Mean	±SD	Mean	±SD	
Functioning scores							
Sexual activity	66.7	30.4	75.5	28.5	83.7	22	0.145
Sexual functioning	60	23.1	43.3	26.6	72.9	14.2	0.11
Symptom scores							
Urinary problems	9.2	22	10.9	18.3	13.5	15.9	0.174
Bowel problems	5	9	4.9	11.2	5.4	12.7	0.925
Hormonal treatment-related symptoms	15.6	9.7	15.3	12.2	12.5	13	0.299

Key= *statistically significant, p≤0.05

4.7.1 Sexual activity

Sexual activity consisted of having interest in sex and extent of being sexually active. Among the respondents more than half had no interest in sex (57.5%; n=65) and 78.8% (n=89) were not sexually active. The summary is provided in table 4.14.

Table 4.14 Sexual activity frequency table (n=113)

Sexual activity	Not at all		A little		Quite a bit		Very much	
	n	%	n	%	n	%	N	%
Sexual interest	65	57.5	10	8.9	20	17.7	18	15.9
Extent of being sexually active	89	78.8	9	8	12	10.6	3	2.7

When calculating the mean score for sexual interest and extent of being sexually active, the latter had a higher score (*M*=87.6; SD±26) while sexual interest had a low score (*M*=69.3; SD±39.4). When comparing time on treatment with sexual interest and extent of being sexually active, sexual interest had a higher mean score between 3-12 months of treatment (*M*=73.2; SD±38.4) while extent of being sexually active had a higher mean score between 15-24 months (*M*=90.4; SD±22.2). However, the Kruskal-Wallis H test did not find any statistically significant differences between time on treatment and sexual activity. The summary is provided in Table 4.15.

Table 4.15 Sexual activity according to treatment (n=113)

Sexual activity	3-12 months (n=15)		15-24 months (n=9)		*P* value
	Mean	±SD	Mean	±SD	
Sexual interest	73.2	38.4	68.7	40.3	0.258
Extent of being sexually active	85.2	28.9	90.4	22.2	0.331

Key= *statistically significant, p≤0.05

When cross-tabulating age with sexual interest and extent of being sexually active, both had a highest score in men aged 70 years and older. The Kruskal-Wallis H test found a statistically significant difference between age groups and the extent of being sexually active. Table 4.16 provides the summary.

Table 4.16 Sexual activity according to age (n=113)

Sexual activity	50-59 years (n=10)		60-69 years (n=51		≥70 years (n=52)		*P* value
	Mean	±SD	Mean	±SD	Mean	±SD	
Sexual interest	56.7	41.7	69.3	41	71.8	37.6	0.52
Extent of being sexually active	76.7	27.4	81.7	31.5	95.5	16.2	0.003*

Key= *statistically significant, p≤0.05

4.7.2 Sexual functioning

Sexual functioning comprised of the extent of enjoyability of sex, difficulty getting/maintaining an erection, having ejaculation problems and feeling uncomfortable about being sexually intimate. Sexual functioning was only reported by respondents who were sexually active (21%; n=24). Table 4.17 provides a summary of the results.

Table 4.17 Sexual functioning frequency table (n=24)

Sexual functioning	Not at all		A little		Quite a bit		Very much	
	n	%	n	%	n	%	n	%
Extent of enjoyability of sex	2	8.3	7	29.2	13	54.2	2	8.3
Difficulty getting/maintaining an erection	6	25	6	25	4	16.7	8	33.3
Ejaculation problems	11	45.8	0	0	4	16.7	9	37.5
Feeling uncomfortable about being sexually intimate	12	50	3	12.5	3	12.5	6	25

Key= *statistically significant, p≤0.05

When calculating the respondents' mean scores, sexual functioning, extent of enjoyability of sex had the highest mean score (*M*=54.2; SD ±25.7) while feeling uncomfortable about being sexually intimate scored the lowest (*M*=37.5; SD ±43.2). The results are summarised in Table 4.18.

Table 4.18 Sexual functioning for the sexually active group (n=24)

Sexual functioning	Mean	±SD
Extent of enjoyability of sex	54.2	25.7
Difficulty getting/maintaining an erection	52.8	40.4
Ejaculation problems	48.6	47.1
Feeling uncomfortable about being sexually intimate	37.5	43.2

When comparing time on treatment with the domains of sexual functioning, all except extent of enjoyability of sex had higher mean scores between 3-12 months of treatment. However, the Kruskal-Wallis H test showed no statistically significant difference between the domains of sexual functioning and time on treatment. Table 4.19 provides the summary.

Table 4.19 Sexual functioning according to time on treatment (n=24)

Sexual functioning	3-12 months (n=15)		15-24 months (n=9)		*P* value
	Mean	±SD	Mean	±SD	
Extent of enjoyability of sex	51.1	27.8	59.3	22.2	0.553
Difficulty getting/maintaining an erection	57.8	40.8	44.4	40.8	0.421
Ejaculation problems	53.3	46.8	40.7	49.4	0.56
Feeling uncomfortable about being sexually intimate	48.9	45.2	18.5	33.8	0.122

Key= *statistically significant, p≤0.05

When cross-tabulating age with domains of sexual functioning, all the domains of sexual functioning except extent of enjoyability of sex had highest mean score for men aged 60 to 69 years. Men aged 70 years and older did not report ejaculation problems. The Kruskal-Wallis H test found a statistically significant difference between age groups and feeling uncomfortable about being sexually intimate. The summary is provided in Table 4.20.

Table 4.20 Sexual functioning according to age (n=24)

Sexual functioning	50-59 years (n=5)		60-69 years (n=15)		≥70 years (n=4)		*P* value
	Mean	±SD	Mean	±SD	Mean	±SD	
Extent of enjoyability of sex	53.3	18.3	53.3	30.3	58.3	16.7	0.936
Difficulty maintaining erection	46.7	38	57.8	44.5	41.7	31.9	0.707
Ejaculation problems	53.3	50.6	60	45.8	0	0	0.088
Feeling uncomfortable about being sexually intimate	6.7	14.9	55.6	44.8	8.3	16.7	0.043*

Key= *statistically significant, p≤0.05

4.7.3 Urinary symptoms

When calculating the mean score for the urinary symptoms, wearing incontinence aids had the highest mean score (*M*=38.9; SD±44.3) followed by frequent urination at night (*M*=28.9; SD±40.9). Urination limiting daily activities had the lowest score (*M*=3.8; SD±16.5). The summary is provided in Table 4.21.

Table 4.21 Urinary symptoms for the total group (n=113)

Symptoms	Mean	±SD
Frequent urination during day	13.3	28.7
Frequent urination at night	28.9	40.9
Urgency to pass urine	12.4	28.6
Disturbed sleep due to frequent urination	18.6	35.3
Staying close to toilet	4.4	17.5
Leakage of urine	7.4	21.2
Painful urination	6.5	19.3
Urination limiting daily activities	3.8	16.5
Wearing incontinence aids	38.9	44.3

When comparing time on treatment with the urinary symptoms, all the symptoms except urgency to pass urine had a higher mean score between 15-24 months of treatment. The Kruskal-Wallis H test found a statistically significant difference between time on treatment and painful urination. Table 4.22 provides the summary.

Table 4.22 Urinary symptoms according to time on treatment (n=113)

Urinary symptoms	**3-12 months (n=61)**		**15-24 months (n=52)**		***P* value**
	Mean	**±SD**	**Mean**	**±SD**	
Frequent urination during day	8.7	24.3	18.6	32.6	0.064
Frequent urination at night	24	39	34.6	42.8	0.166
Urgency to pass urine	13.1	30	11.5	27.1	0.966
Disturbed sleep due to frequent urination	14.8	31.9	23.1	38.8	0.229
Staying close to toilet	4.4	16.6	4.5	18.7	0.885
Leakage of urine	5.5	17.4	9.6	25	0.36
Painful urination	2.7	11	10.9	25.3	0.037*
Urination limiting daily activities	3.3	14.5	4.5	18.7	0.824
Wearing incontinence aids	33.3	47.1	41.7	50	0.803

Key= *statistically significant, p≤0.05

When cross-tabulating age with urinary symptoms, frequent urination during the day, frequent urination during the night, urgency to pass urine, disturbed sleep due to frequent urination, urine leakage and wearing incontinence aids had the highest score in men aged 70 years and older. Wearing incontinence aids was also experienced by men aged 60 years and older. However, the Kruskal-Wallis H Test did not find statistically significant differences between age groups and urinary symptoms. The summary is provided in Table 4.23.

Table 4.23 Urinary symptoms according to age (n=113)

Urinary symptoms	50-59 years (n=10)		60-69 years (n=51		≥70 years (n=52)		*P* value
	Mean	±SD	Mean	±SD	Mean	±SD	
Frequent urination during day	10	31.6	12.4	29	14.7	28.3	0.671
Frequent urination at night	16.7	36	23.5	38.5	36.5	43.4	0.162
Urgency to pass urine	10	31.6	11.1	27.2	14.1	29.8	0.735
Disturbed sleep due to frequent urination	13.3	23.3	16.3	34.9	21.8	37.9	0.705
Staying close to toilet	6.7	21	5.2	18.1	3.2	16.5	0.636
Leakage of urine	6.7	21	7.2	20.3	7.7	22.5	0.948
Painful urination	3.3	10.5	7.2	19.2	6.4	20.9	0.901
Urination limiting daily activities	6.7	21.1	3.9	15.8	3.2	16.5	0.725
Wearing incontinence aids	0	0	33.3	38.5	50	70.7	0.617

Key= *statistically significant, p≤0.05

4.7.4 Bowel symptoms

When calculating the respondents' mean scores for bowel symptoms, having a bloated abdomen had a highest mean score (*M*=15.6; SD±31.5) and leakage of stool had the lowest mean score (*M*=1.5; SD±11.3). Table 4.24 provides the summary.

Table 4.24 Bowel symptoms for the total group (n=113)

Bowel symptoms	Mean	±SD
Bowel problems limiting daily activities	1.8	9.8
Leakage of stool	1.5	11.3
Bloody stool	1.8	10.8
Bloated abdomen	15.6	31.5

When comparing time on treatment with the bowel symptoms, all the symptoms had a higher score between 15-24 months of treatment. However, there was no statistically significant difference between time on treatment and the bowel symptoms. The summary is presented in Table 4.25.

Table 4.25 Bowel symptoms according to time on treatment (n=113)

Bowel symptoms	3-12 months (n=61)		15-24 months (n=52)		*P* value
	Mean	±SD	Mean	±SD	
Bowel problems limiting daily activity	1.6	9.5	1.9	10.3	0.872
Leakage of stool	1.1	8.5	1.9	13.9	0.9
Bloody stool	1.6	7.3	1.9	13.9	0.408
Bloated abdomen	10.9	24.1	21.2	37.9	0.227

Key= *statistically significant, p≤0.05

When cross-tabulating age with the bowel symptoms, bowel problems limiting daily activities were only experienced by men aged 60 to 69 years, while leakage of stool was experienced by men aged 60 years and older. Bloated abdomen had a highest score in men aged 70 years and older. The Kruskal-Wallis H test found a statistically significant difference between the age groups and bloody stool. Table 4.26 provides the summary.

Table 4.26 Bowel symptoms according to age (n=113)

Bowel symptoms	50-59 years (n=10)		60-69 years (n=51		≥70 years (n=52)		*P* value
	Mean	±SD	Mean	±SD	Mean	±SD	
Bowel problems limiting daily activity	0	0	3.9	14.3	0	0	0.082
Leakage of stool	0	0	1.3	9.3	1.9	13.9	0.907
Bloody stool	6.7	14.1	0.7	4.7	1.9	13.9	0.015*
Bloated abdomen	13.3	28.1	13.7	29.9	17.9	34	0.852

Key= *statistically significant, p≤0.05

4.7.5 Hormonal treatment-related symptoms

When calculating the mean score for hormonal treatment-related symptoms, hot flushes had the highest mean score (*M*=46; SD±40.4) while enlarged breasts had the lowest (*M*=6.2; SD±23). Table 4.27 provides the summary.

Table 4.27 Hormonal treatment-related symptoms for the total group (n-113)

Hormonal treatment-related symptoms	Mean	±SD
Hot flushes	46	40.4
Enlarged breasts	6.2	23
Swollen legs	10.9	25.4
Weight loss	3.2	14.7
Weight gain	8	21.9
Feeling less masculine	9.7	24.7

When comparing time on treatment with all the hormonal treatment-related symptoms, hot flushes, swollen legs and feeling less masculine had higher scores between 15-24 months of treatment. The Kruskal-Wallis H test found a statistically significant difference between hot flushes and time on treatment. Table 4.28 summarises the results.

Table 4.28 Hormonal treatment-related symptoms according to time on treatment (n=113)

Hormonal treatment-related symptoms	3-12 months (n=61)		15-24 months (n=52)		*P* value
	Mean	±SD	Mean	±SD	
Hot flushes	38.8	39.1	54.5	40.7	0.045*
Enlarged breasts	7.1	24.4	5.1	21.3	0.622
Swollen legs	6.6	18.1	16	31.3	0.166
Weight loss	3.3	15.8	3.2	13.6	0.853
Weight gain	9.3	23.7	6.4	19.8	0.581
Feeling less masculine	9.3	24.4	10.3	25.2	0.738

Key= *statistically significant, p≤0.05

When cross-tabulating age with hormonal treatment-related symptoms, swollen legs and feeling less masculine were experienced by men aged 60 years and older. Hot flushes, enlarged breasts, weight loss and weight gain had the highest score in men aged 50 to 59 years. However, the Kruskal-Wallis H test did not find a statistically significant difference between age groups and the hormonal treatment-related symptoms. Table 4.29 provides the summary.

Table 4.29 Hormonal treatment-related symptoms according to age (n=113)

Hormonal treatment-related symptoms	50-59 years (n=10)		60-69 years (n=51		≥70 years (n=52)		*P* value
	Mean	±SD	Mean	±SD	Mean	±SD	
Hot flushes	53.3	45	49.7	39.6	41	40.5	0.436
Enlarged breasts	13.3	28.1	7.8	27.2	3.2	16.5	0.214
Swollen legs	0	0	6.5	18.9	17.3	31.3	0.051
Weight loss	10	31.6	5.2	16.8	0	0	0.069
Weight gain	16.7	28.3	8.5	22.9	5.8	19.5	0.234
Feeling less masculine	0	0	13.7	28.4	7.7	22.5	0.181

Key= *statistically significant, p≤0.05

4.8 SUMMARY

The chapter presented the results of the study. Chapter five will discuss the results, justification of the study, limitations, recommendations and conclusion.

CHAPTER FIVE

DISCUSSION, JUSTIFICATION, LIMITATIONS, RECOMMENDATIONS AND CONCLUSION

5.1 INTRODUCTION

Chapter four presented the research results. Chapter five will present the discussion, justification of the study, limitations, recommendations and conclusion.

5.2 DISCUSSION

Considering the effects of cancer and treatment on the lives of individuals, HRQoL is a major factor in deciding treatment options for patients. The current study described the HRQoL of men treated with hormonal therapy for prostate cancer at an academic hospital in Gauteng. The results of the study showed that prostate cancer and hormonal therapy affected the HRQoL of individuals. The study provided baseline data to address the existing knowledge gap, in order to stimulate research and guide nurses to provide holistic patient-centred care to improve HRQoL

When considering the age of the respondents, the mean age was 68.8 years (SD±7.3) with a higher proportion aged 70 years and older. The finding was consistent with studies reporting increasing age as a risk for prostate cancer. For instance, the US cancer epidemiological review from 1975 to 2014 revealed that 123.4 per 100,000 men were diagnosed at ages between 45-49 years, 265.3 per 100,000 were diagnosed between 55-59 years and 718.4 between 70-79 years (Noone et al., 2017). The trend in Europe, showed that only 25% of prostate cancer was diagnosed before the age of 65 years (Cuzick et al., 2014). A steady increase in numbers of men diagnosed with prostate cancer in South Africa was observed from the age of 50 years and men reported with prostate cancer at a mean age of 68 years (SD±9.6) (Babb et al., 2014). Data from a rural regional hospital revealed an estimated incidence rate of 5.8 per 100,000 for men aged 45-49, 32.2 per 100,000 for men aged 50-54 and increased by almost four times to 125.4 per 100,000 for men 55-59 years old. The incidence increased to 291 per 100,000 for 60-64 year and 493.9 per 100.000 for those aged 65-69 years. Statistics from a regional hospital in South Africa presented a higher age at diagnosis (72 years; SD±9) compared to what was presented by the National Cancer Registry (68years; SD±9.6) (Le Roux et al.,

2015; Babb et al., 2014).

Most of the respondents were married (62.8%; n=71). Other studies done in South Africa (Mofolo et al., (2015), South Korea (Kim et al., 2017), Netherlands (Voerman et al., 2006), Brazil (Seemann et al., 2018), US (Quon et al., 2012), Italy (Saini et al., 2013) and Lithuania (Vanagas, Mickevičienė & Ulys, 2013) also reported that most of the respondents were married.

The highest level of education attained by most of the participants was grade 8-10 (high school). Similarly, other studies conducted in South Africa (Mofolo et al., 2015), the Netherlands (Voerman et al., 2006) and Lithuania (Vanagas, Mickevičienė & Ulys, 2013) reported most respondents having attended high school. However, respondents from other studies attained different educational levels. For instance, a study in South Korea and Brazil reported most respondents had attended elementary school (Kim et al., 2017; Seemann et al., 2018), in Pan European countries had attained less than high school education (Selli et al., 2014), in Italy they had attended primary school (Saini et al., 2013) while in US most respondents had obtained advanced degrees (Herr & O'Sullivan, 2000). These studies highlighted the differences in education levels from studies done in various areas

It was interesting to find that, despite respondents' experiencing various symptoms like fatigue, pain, insomnia and constipation, urinary problems, bowel problems and hormonal treatment-related symptoms, the global health status and overall health was higher between 15-24 months of treatment. On the contrary, a decline in the global health status was reported at six and 18 months of treatment in a study done in the Netherlands, however, the findings were statistically significant only at six months (Van Andel & Kurth, 2003). Similarly, another study in the same country found a decline in global health status after 2 years of treatment (Voerman et al., 2006). Men of lower socioeconomic status in the US had a decline in global health status at three and 12 months after hormonal therapy (Siston et al., 2003), while a prospective observational study on the burden of illness in prostate cancer patients with low-to-moderate risk of progression in Pan-European countries reported significant decrease in global health status at three months, which was also statistically significant (Selli et al., 2014). The author further reported that at 12 months the global health status had improved and was not different from baseline in the Pan-European study. The differences could possibly be linked to the differences

in the design of the studies as the current study looked at 3-12 months and 15-24 months of treatment. The other possibility is the higher role functioning between 15-24 months of treatment that despite having the disease, the respondents were able to carry out their day to day activities.

The physical functioning of the respondents was lower between 15-24 months of treatment, though the difference was not statistically significant. This could be linked to symptoms experienced like fatigue, pain, insomnia, hot flushes and urinary problems that were worse between 15-24 months of treatment. Similarly, Kim et al (2017) reported a decline in the first year of treatment, then thereafter up to 35 months and over 36 months. Alibhai et al. (2015), in a prospective study conducted in Canada, supported this trend and reported a decline in physical functioning in the first six months and afterwards. Similarly, a decline in physical functioning was reported in a US prospective study that followed patients up at two, five and 10 years (Punnen et al., 2014) and in Japan at three months, then improved at 12 months but was still lower than the baseline (Ueno et al., 2018).

Emotional functioning, which includes feeling tense, irritable, depressed and worried was low between 15-24 months of treatment and could be ascribed to the insomnia, financial problems, fatigue and pain that the respondents experienced. A study conducted in the US focusing on the impact of androgen deprivation therapy on emotional well-being in men with prostate cancer, reported changes in emotional well-being with a decline observed at 18 months, however there was no meaningful decline at 24 months (Cary et al., 2014). A similar trend of poor emotional well-being was reported in South Korean patients that had depression (Kim et al., 2017). Similarly, a longitudinal study done in Taiwan (Chung et al., 2017) agreed that hormonal therapy was associated with depression which affected the emotional functioning of men treated for prostate cancer.

As evident by the study, the respondents experienced a decline in cognitive functioning between 15-24 months of treatment. Various studies support this finding. For instance, Voerman et al. (2006) in a study conducted among Dutch men, reported a worse cognitive functioning in the second year of treatment. Similarly, a randomised study done in Australia to test if hormonal therapy was associated with cognitive impairment, reported of a significant decline in memory and attention of the participants at 6 months of treatment (Green et al., 2002). A US study agreed that

cognitive impairment was associated with hormonal therapy for prostate cancer (Jim et al. 2010). However, these results were not confirmed in a large longitudinal prospective study that followed up Canadian patients on hormonal therapy for a year (Alibhai et al., 2017). The author further reported of a test that demonstrated a decline in immediate attention span and working memory, though other tests failed to show the same decline. It is important to note that studies done in the US did not find decline in cognitive functioning at six months (Mohile, 2010) and at 24 months after treatment (Cary et al., 2014).

Due to conflicting findings from studies, a literature review was conducted to determine the effects of hormonal therapy and it was found that patients receiving hormonal therapy had focal cognitive deficit in visuomotor ability and not in functions like working memory, attention, and verbal memory. The author further stated that patients on hormonal therapy can function like those not on the treatment in these areas. However, the study did not consider if age and education influenced the results (McGinty et al., 2014). In the current study cognitive function declined with age. Consistent results were reported in studies done in US that reported of cognitive impairment increasing with age (Plassman et al., 2007; Plassman et al., 2008). The studies are revealing conflicting results that could be linked to the differences in length of time an individual is on treatment, educational level and the design of the studies. Patients taking hormonal therapy for a long time could possibly present with decline in cognitive functioning. A longitudinal study with baseline data would help identify possible effects of hormonal therapy in the current setting.

The current study also provided evidence that cancer and its treatment had a negative influence on the social functioning of the respondents. The physical symptoms like insomnia, fatigue and pain that the respondents experienced interfered with their family life and social activities. Van Andel and Kurth (2003), in a study conducted in the Netherlands, found a similar trend and reported a decline in social functioning in a similar patient population after 18 months of treatment, which was not statistically significant. In addition, Kim et al., (2017) also observed a similar decline in social functioning at 34.6 months of treatment. A significant decline in social functioning was reported in patients that had depression (Kim et al, 2017).

In the current study fatigue influenced the respondents' HRQoL negatively. The respondents experienced severe frequent urination during the day and night,

disturbed sleep and pain between 15-24 months of treatment, which could be linked to fatigue as it was also worse during this period. A systematic review on characteristics and predictors of fatigue among men receiving hormonal therapy found that prostate cancer patients experienced severe fatigue during the first 12 months following treatment (Nelson et al., 2016). Fatigue was reported in a cross-sectional study in UK and was indicated to be common in men with depression, anxiety, pain and urinary symptoms (Storey et al., 2012). Jim et al. (2012), and Roviello and Generali (2018) also agree that fatigue is a side-effect of hormonal therapy treatment. It was interesting to find that respondents aged 50-59 years had the worst fatigue while those aged 60-69 years experienced the least. This could be linked to the small size of respondents in the age group 50-59 years.

The respondents experienced pain in the course of treatment and respondents receiving treatment between 15-24 months experienced more pain. A systematic review of literature was done on toxicity profile characteristics of novel hormonal therapy and reported that pain was one of the adverse effects (Roviello & Generali, 2018). Pain in prostate cancer can occur in early or advanced stages and can be a result of the cancer, treatment or none of the two (Bader et al., 2012). Severe pain has been reported in patients on hormonal therapy (Voerman et al., 2006). Pain was reported to be severe at three months of treatment and not at 12 months in a prospective study conducted in Pan European countries (Selli et al., 2014). Bone pain has been reported in metastatic prostate cancer (Broder et al., 2014).

Of all the general symptoms, nausea and vomiting had the lowest score. It was interesting to find that only respondents aged 70 years and above between 15-24 months of treatment experienced nausea and vomiting. It was also noted that gastrointestinal symptoms such as diarrhoea and loss of appetite scored low except for constipation. Literature reviews reported diarrhoea, constipation, nausea and vomiting as commonly associated with hormonal therapy (Kumar, Barqawi & Crawford, 2005) while Higano (2003) indicated only nausea, which was associated with hot flushes in prostate cancer patients receiving hormonal therapy. A study in the UK reported nausea and vomiting in a small proportion of patients at three months (Stone et al., 2000). Selli et al. (2014) reported that nausea and vomiting was not different from baseline at three however it reduced at 12 months though it was not significant. The studies indicated differences in how hormonal therapy affected individuals on hormonal therapy and a longitudinal study is needed to explain the

differences.

The respondents in the study experienced financial difficulties during the time of treatment. The financial problems were less between 15-24 months of treatment. Most of the respondents were pensioners who were receiving social grants amounting to more than the breadline of R779 per month (Statistics South Africa, 2015). The finding agrees with an investigation into the QoL of cancer patients in South Africa (Van Rensburg et al., 2017) that reported poverty as a major issue affecting the physical aspect of QoL. Kimman et al. (2015), in a longitudinal study done in 10 Southeast Asian Nations, confirmed that cancer caused financial problems due to cancer treatment. The author stated that men over 65 years with advanced disease, low income, low education level and unmarried were likely to face financial problems. In the current study most of the respondents were married and over 60 years old.

The study revealed that the respondents experienced insomnia, which was worse between 15-24 months of treatment. The insomnia could be due to disturbed sleep resulting from frequent urination at night, pain and hot flushes. Gonzalez et al. (2018) reported sleep disturbance that doubled in the first six months of treatment and was associated with nocturia and hot flushes. Consistent results were reported in a prospective study carried out in the UK (Challapalli et al., 2018), in a cross-sectional study carried out in Brazil (Araújo, Barbosa & Barichello, 2014) and a prospective study carried out in Turkey, where hormonal therapy was strongly associated with sleep disturbance.

The study provided evidence that the respondents experienced various urinary symptoms, which were more prevalent between 15-24 months of treatment. Frequent urination during the night was the most troublesome symptom. However, the respondents also experienced frequent urination during the day, even though there was no statistically significant difference between 3-12 months and 15-24 months of treatment for all urinary symptoms except painful urination. A prospective study done in Japan revealed patients had reduced urinary problems at three months, but at 12 months there was no significant difference from the baseline (Ueno et al., 2018). Another prospective study in Japan observed a significant increase in urine frequency at night at three and six months of androgen deprivation therapy (Washino, 2016). However, Selli et al. (2014) reported of worsened urinary problem

at three months after initiation of treatment which declined at 12 months but did not reach baseline. The author reported of the incontinence aids problem as statistically significant at three months, while in the current study painful urination was worse between 15-24 months of treatment and was statistically significant.

Although to a lesser extent compared to urinary problems, the respondents also experienced bowel symptoms, primarily a bloated abdomen, while leakage of stool scored the lowest mean. The bowel symptoms were worse between 15-24 months of treatment even though not statistically significant. However, in a study of long-term HRQoL after primary treatment of localised prostate cancer, Punnen et al. (2014) reported a decline in bowel problems at one and two years of treatment. There was a worsening of problems after three years but thereafter bowel problems progressively declined for 10 years. A review of the literature has reported that bowel problems are infrequent in both localised and advanced prostate cancer (Eton & Lepore, 2002). However, it would be important for further studies to look at leakage of stool in prostate cancer as men grow older. The differences in results could be linked to the study design where the current study was a cross-sectional while Punnen et al. conducted a cohort study.

When considering the hormonal symptoms, the study provided evidence that most of the respondents (80%) experienced hot flushes which were more prevalent between 15-24 months of treatment. Walker, Tran and Robinson (2013) after conducting a comprehensive literature review found a similar trend and reported hot flushes as one of the adverse effects of ADT. Other authors have also reported that hot flushes are commonly associated with ADT (Freedland, Eastham & Shore, 2009; Jones, Kohli & Loprinzi, 2012) and that hot flushes affect 80% of patients (Ahmadi & Daneshmand, 2014). In addition, Iversen et al., (2011) in a randomised clinical trial done in the UK reported the same results. This was also supported by Nishiyama et al. (2004) who did a survey in Japan and reported hot flushes at less than six months, 6-12 months and more than 12 months. Men who were getting treatment after 12 months reported more severe hot flushes than those in the first year and hot flushes affected the physical well-being and deteriorated the patients' QoL. Hot flushes were reported in patients who were followed up in the US for a year. The patients reported of experiencing hot flushes at three and 12 months (Siston et al., 2003). Moderate to severe hot flushes were commonly reported in a longitudinal study done in the UK when patients were followed up and assessed for symptoms at

any time. While 20% reported no hot flushes for more than six months, 40% had symptoms that disrupted their daily activities. The severity of the symptoms was not determined by the duration on treatment (Challapalli et al., 2018). The current study demonstrated that the youngest age group of 50-59 years experienced the worst hot flushes. The result was consistent with a study done in the UK where the younger men experienced severe hot flushes (Challapalli et al., 2018).

The study revealed how the sexual life of respondents was affected. Over half (57.5%; n=65) of the respondents reported no interest in sex, while 79 % indicated they were still sexually active. Sexual interest was lower for the respondents between 15-24 months of treatment, though not statistically significant. This finding is not surprising as ADT suppresses production of testosterone leading to loss of libido and erectile dysfunction (Mazzola & Mulhall, 2012). Similar results have been reported in various studies. Huang et al. (2010), in a study where patients on ADT were followed up for four years, reported significant worsening of sexual functioning until two years, with no changes beyond that period. In addition, Donovan et al. (2017), in a similar study, reported respondents experienced a decline in sexual functioning at six and 12 months of follow up. While Selli et al. (2014), in a prospective study, Reported worse sexual activity at three and 12 months of follow up, Siston et al. (2003) reported severe decline in sexual activity and functioning in a study conducted in the US but an improvement after a year of follow-up. However, it was interesting that despite the reduced interest, the respondents seemed more active sexually. In addition, even though sexual activity and functioning were affected, some respondents still had interest in sex, were sexually active and sexual interest was increasing with age even though it was not statistically significant. It was also found that the extent of being sexually active was increasing with age and was statistically significant. However, the majority of the respondents felt uncomfortable about sexual intimacy because they had lost interest in sex and had difficulties to maintain erection. A review of literature found that even though men on ADT experience decline in sexual interest and erectile function, patients still have a degree of libido and sexual function (Fode & Sønksen, 2014). With such observations in the current study, there is need to support these patients and their spouses before and during hormonal therapy.

5.3 JUSTIFICATION

The study aimed to describe the HRQoL of men treated with hormonal therapy for prostate cancer at an academic hospital in Gauteng. Chapter one gave an overview

of the study and Chapter two presented a review of the literature. In Chapter three an in-depth description of the research methods and design was given. In Chapter four, the results were presented including comparisons at different time periods of treatment and age. Chapter five presented a discussion of the results, justification, limitations, recommendations and conclusion. It can therefore be concluded that the study is justified.

5.4 LIMITATIONS

The limitations of the study were the following:

- A convenience sampling method was used to select respondents and as such the data cannot be generalised.
- Most of the respondents were Black South Africans and the results cannot be generalised to other socio-cultural groups.
- The study was a cross sectional and thus could not address the changes from the pre-treatment baseline.
- The study did not capture confounders and there is a possibility that the reported health problems could be the result of other underlying causes than the one under study
- Recall bias - there is a possibility of patients having forgotten the problems or symptoms experienced, and their severity.
- Patients were enrolled based on inclusion criteria. There is a possibility that those who were left out were different from those recruited and with different experience.

5.5 RECOMMENDATIONS

Following the findings, nurses should maintain a high awareness regarding the side effects men receiving hormonal treatment could experience. The nurses should conduct accurate assessment with proper management, provide adequate information to patients and close relations regarding the illness, treatment and the needed support. It is also essential for nurses to create openness for patients to discuss their disease and treatment related problems. Further studies are needed, including a longitudinal study with a large sample, to explore changes over time and factors that affect the HRQoL of patients.

5.6 CONCLUSION

In conclusion, the study provided evidence that hormonal therapy affected the HRQoL of men treated for prostate cancer. It was observed that physical-, emotional-, cognitive- and social problems, sexual-, urinary- and bowel problems and hormonal treatment-related symptoms affected the HRQoL of patients. It is therefore important for nurses to thoroughly assess patients, give adequate information and support to help them cope with the illness.

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ADDENDUM 1

To
tikondwesichinga@yahoo.com
Mar 20 at 11:25 AM

qlqc30@eortc.be

Dear Sir/Madam,

Please find below the links where you can download the documents you requested.

Best regards,

Your data:

Title: Mr
Firstname: Tikondwe
Lastname: Sichinga
Hospital/Institution: University of Witwatersrand
Address: Department of Nursing Education
County/State: South Africa Postal Code: +27
Country: South Africa Phone: +27 (0) 628844256
Fax:
Email: tikondwesichinga@yahoo.com
Protocol: A QUANTITATIVE ASSESSMENT OF QUALITY OF LIFE IN MEN LIVING WITH PROSTATE CANCER
Documents requested:
QLQ-C30 Core Questionnaire in English
Prostate Module (PR25) in English
QLQ-C30 Scoring Manual
Scoring Instructions: Prostate PR25

URLs:

http://www.eortc.be/qol/files/C30/QLQ-C30%20English.pdf
http://www.eortc.be/qol/files/PR25/PR25%20English.pdf
http://www.eortc.be/qol/files/SCManualQLQ-C30.pdf
http://www.eortc.be/qol/files/ScoringInstructions/PR25_summary.pdf

If the links don't work, you can copy and paste the entire URL (so with .pdf included) into your browser and that should work. If you are having other technical difficulties please contact us by email: qlqc30@eortc.be

ADDENDUM 2

Date of interview (dd/mm/yyyy):____/_____/_____ Questionnaire No: _____

GENERAL INFORMATION

No	Question	Response
1	How old are you?	
2	What is your marital status?	…… Single/not married …… Married …….. Living with partner ……. Separated …… Divorced …….. Widower
3	What is the highest level of education you have completed?	……. Never went to school ……..Grade 1-7 ……..Grade 8-10 ……..Grade 11-12 ……..Tertiary education
4	What is your occupation?	
5	What is your social cultural group?	……IsiZulu ……Setswana ……IsiXhosa ……..Others specify
6	Do you know the stage of your disease?	…….Yes ……..No
7	If yes, Please tell me?	
8	How long have you been on hormonal treatment for prostate cancer?	
9	What is your main source of income?	……No income ……Self-employed ……Employed ……Social grant ……Others (specify)
10	Is your income more than R779 per month?	..... More .....Less

ENGLISH

EORTC QLQ-C30 (version 3)

We are interested in some things about you and your health. Please answer all of the questions yourself by circling the number that best applies to you. There are no "right" or "wrong" answers. The information that you provide will remain strictly confidential.

Please fill in your initials: _____

Your birthdate (Day, Month, Year): _____

Today's date (Day, Month, Year): 31 _____

		Not at All	A Little	Quite a Bit	Very Much
1.	Do you have any trouble doing strenuous activities, like carrying a heavy shopping bag or a suitcase?	1	2	3	4
2.	Do you have any trouble taking a long walk?	1	2	3	4
3.	Do you have any trouble taking a short walk outside of the house?	1	2	3	4
4.	Do you need to stay in bed or a chair during the day?	1	2	3	4
5.	Do you need help with eating, dressing, washing yourself or using the toilet?	1	2	3	4

During the past week:		Not at All	A Little	Quite a Bit	Very Much
6.	Were you limited in doing either your work or other daily activities?	1	2	3	4
7.	Were you limited in pursuing your hobbies or other leisure time activities?	1	2	3	4
8.	Were you short of breath?	1	2	3	4
9.	Have you had pain?	1	2	3	4
10.	Did you need to rest?	1	2	3	4
11.	Have you had trouble sleeping?	1	2	3	4
12.	Have you felt weak?	1	2	3	4
13.	Have you lacked appetite?	1	2	3	4
14.	Have you felt nauseated?	1	2	3	4
15.	Have you vomited?	1	2	3	4
16.	Have you been constipated?	1	2	3	4

Please go on to the next page

During the past week:	Not at All	A Little	Quite a Bit	Very Much
17. Have you had diarrhea?	1	2	3	4
18. Were you tired?	1	2	3	4
19. Did pain interfere with your daily activities?	1	2	3	4
20. Have you had difficulty in concentrating on things, like reading a newspaper or watching television?	1	2	3	4
21. Did you feel tense?	1	2	3	4
22. Did you worry?	1	2	3	4
23. Did you feel irritable?	1	2	3	4
24. Did you feel depressed?	1	2	3	4
25. Have you had difficulty remembering things?	1	2	3	4
26. Has your physical condition or medical treatment interfered with your family life?	1	2	3	4
27. Has your physical condition or medical treatment interfered with your social activities?	1	2	3	4
28. Has your physical condition or medical treatment caused you financial difficulties?	1	2	3	4

For the following questions please circle the number between 1 and 7 that best applies to you

29. How would you rate your overall health during the past week?

1	2	3	4	5	6	7
Very poor						Excellent

30. How would you rate your overall quality of life during the past week?

1	2	3	4	5	6	7
Very poor						Excellent

ENGLISH

EORTC QLQ - PR25

Patients sometimes report that they have the following symptoms or problems. Please indicate the extent to which you have experienced these symptoms or problems during the past week. Please answer by circling the number that best applies to you.

During the past week	Not at all	A little	Quite a bit	Very much
31. Have you had to urinate frequently **during the day**?	1	2	3	4
32. Have you had to urinate frequently **at night**?	1	2	3	4
33. When you felt the urge to pass urine, did you have to hurry to get to the toilet?	1	2	3	4
34. Was it difficult for you to get enough sleep, because you needed to get up frequently at night to urinate?	1	2	3	4
35. Have you had difficulty going out of the house because you needed to be close to a toilet?	1	2	3	4
36. Have you had any unintentional release (leakage) of urine?	1	2	3	4
37. Did you have pain when you urinated?	1	2	3	4
38. Answer this question only if you wear an incontinence aid. Has wearing an incontinence aid been a problem for you?	1	2	3	4
39. Have your daily activities been limited by your urinary problems?	1	2	3	4
40. Have your daily activities been limited by your bowel problems?	1	2	3	4
41. Have you had any unintentional release (leakage) of stools?	1	2	3	4
42. Have you had blood in your stools?	1	2	3	4
43. Did you have a bloated feeling in your abdomen?	1	2	3	4
44. Did you have hot flushes?	1	2	3	4
45. Have you had sore or enlarged nipples or breasts?	1	2	3	4
46. Have you had swelling in your legs or ankles?	1	2	3	4

Please go to the next page

During the last 4 weeks…	Not at all	A little	Quite a bit	Very much
47. Has weight **loss** been a problem for you?	1	2	3	4
48. Has weight **gain** been a problem for you?	1	2	3	4
49. Have you felt less masculine as a result of your illness or treatment?	1	2	3	4
50. To what extent were you interested in sex?	1	2	3	4
51. To what extent were you sexually active (with or without intercourse)?	1	2	3	4

PLEASE ANSWER THE NEXT FOUR QUESTIONS ONLY IF YOU HAVE BEEN SEXUALLY ACTIVE OVER THE LAST 4 WEEKS

52. To what extent was sex enjoyable for you?	1	2	3	4
53. Did you have difficulty getting or maintaining an erection?	1	2	3	4
54. Did you have ejaculation problems (eg dry ejaculation)?	1	2	3	4
55. Have you felt uncomfortable about being sexually intimate?	1	2	3	4

ADDENDUM 5

University of the Witwatersrand

Department of Nursing Education

School of Therapeutic Science

Faculty of Health Science

7 York Road, Parktown 2193

Johannesburg.

13th April 2017.

The Director of Nursing

Charlotte Maxeke Johannesburg Academic Hospital

7 York Road, Park Town

Johannesburg 2193.

Dear Ms Martha Pule,

REQUEST FOR PERMISSION TO CONDUCT RESEARCH

I am Tikondwe Sichinga, a Master of Science Student at the University of Witwatersrand. I have written seeking permission to carry out a research study in your hospital in the Radiology Oncology clinic. My supervisor is Prof. Lize Maree.

The title of the study is: '**Health-related quality of life of men treated with hormonal therapy for prostate cancer**'.

The study aimed to describe the HRQoL of men treated with hormonal therapy for prostate cancer at an academic hospital in Gauteng I have attached a copy of the proposal to help you have a better understanding of the study. Should you have any questions, do not hesitate to contact me or my supervisor.

Tikondwe Sichinga: Phone # 0628844256, email: 1424843@students.wits.ac.za

Prof. Lize Maree: Phone # 011 488 4272; email Lize.Maree@wits.ac.za

Upon completion of the study, I undertake to provide you with a bound copy of the research report.

Your permission to conduct this study will be greatly appreciated.

Yours sincerely

Tikondwe Sichinga

ADDENDUM 6

PARTICIPANT INFORMATION LEAFLET

Good day,

My name is Tikondwe Sichinga. I am a postgraduate student for Master of Science in Nursing (Oncology and Palliative Care) in the Department of Nursing Education, at the University of the Witwatersrand. I write to invite you to consider participating in a research study entitled 'Health-related quality of life of men treated with hormonal therapy for prostate cancer'. It is necessary for you to understand the explanations below regarding the purpose of the study, risks, benefits and your rights before you agree to participate. Should you have any question, you are free to ask me in person. You should agree to participate only if you are satisfied with procedures involved. Please do not agree to participate if you are engaged in another study at present. Should you decide to take part in this study, you will be required to sign this document as a proof of the agreement and you will get a copy.

Aim

The study aimed to describe the HRQoL of men treated with hormonal therapy for prostate cancer at an academic hospital in Gauteng

Procedures

If you agree to participate in this study, you will be required to answer questions that I will ask you. If you are not comfortable with any question asked, you will have the right not to answer it. The interviews will be done in a private room to ensure that no one hears your answers and it will take 20 minutes. The completed questionnaires will be placed in a sealed box.

Your rights

You have the right to choose whether you would like to take part in the study or not. You are also free to decide whether or not to complete the questionnaire at any time. If you choose not to take part, your treatment and care will not be influenced. Numbers will be used on the questionnaires instead of your name in order to maintain the right to privacy and confidentiality. Your information will be treated with high level of confidentiality. However, your information might be inspected by the supervisor and the University of the Witwatersrand Human Research Ethics

Committee (HREC).

Benefits of the study

This study may not have direct benefit for you; however, the information will help nurses in planning and delivering care for prostate cancer patients.

Risks

There is no foreseen risk to you as a participant in responding to the questionnaires. However, should you have any discomfort regarding responding to the questions at any point, do not hesitate to inform me and you will be referred to Mr Charles Ngwanza for further care. You are also free to contact Mr Ngwanza on 0843318753 if you need counselling.

Ethical approval

This study protocol has been submitted to the University of the Witwatersrand Human Research Ethics Committee (HREC) and written approval has been granted. Permission was also sought from the research site and was granted.

Reimbursement for the study participation

You will not be paid for participating in this study.

Sources of information

If you need further clarification or have a question concerning participation in this study, you are free to contact me (Tikondwe Sichinga) at 0628844256 or email to 1424843@students.wits.ac.za at any time. If you want any information regarding your rights as a research participant, or complaints regarding this research study, you may contact Prof. Cleaton-Jones, Chairperson of the University of the Witwatersrand Human Research Ethics Committee (HREC), which is an independent committee established to help protect the rights of research participants at (011) 717 2301.

Yours faithfully,

Tikondwe Sichinga

Date_____

ADDENDUM 7

INFORMED CONSENT FOR PARTICIPATION

I hereby confirm that I have been informed by the researcher,_____, (Name of the researcher) about the nature, conduct, benefits and risks of study entitled 'Health-related quality of life of men treated with hormonal therapy for prostate cancer'.

I have also received, read and understood the above written information (Participant Information Leaflet and Informed Consent) regarding the research study.

I am aware that the results of the study, including personal details regarding my age, date of birth, initials and diagnosis will be anonymously processed into a study report.

In view of the requirements of research, I agree that the data gathered during this study can be accessed by the supervisor and other authorities.

I may, at any stage, without prejudice, withdraw my consent and participation in the study.

I have had sufficient opportunity to ask questions and (of my own free will) declare myself prepared to participate in the study.

Participant:

_____

Printed Name Signature / Mark or Thumbprint Date and Time

I, _____. (Name of the researcher) herewith confirm that the above participant has been fully informed about the nature, conduct and risks of the above study.

Researcher:

_____

Printed Name Signature Date and Time

WITNESS (If applicable)**:**

_____

Printed Name Signature Date and Time

ADDENDUM 8

R14/49 Mr Tikondwe Sichinga

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)

CLEARANCE CERTIFICATE NO. M170567

NAME: (Principal Investigator)	Mr Tikondwe Sichinga
DEPARTMENT:	Nursing Education Charlotte Maxeke Johannesburg Academic Hospital
PROJECT TITLE:	Health-related Quality of Life of Men treated with Hormonal Therapy for Prostate Cancer
DATE CONSIDERED:	26/05/2017
DECISION:	Approved unconditionally
CONDITIONS:	
SUPERVISOR:	Prof Lize Maree
APPROVED BY:	Professor A. Woodiwiss Co-Chairperson, HREC (Medical)
DATE OF APPROVAL:	16/08/2017

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 Research Office Secretary in Room 10004,10th floor, Senate House/3rd floor, Phillip Tobias Building, Parktown, University of the Witwatersrand. I/We fully understand the conditions under which I am/we are authorised to carry out the above-mentioned research and I/we undertake to ensure compliance with these conditions. Should any departure be contemplated, from the research protocol as approved, I/we undertake to resubmit to the Committee. **I agree to submit a yearly progress report**. The date for annual re-certification will be one year after the date of convened meeting where the study was initially reviewed. In this case, the study was initially review May and will therefore be due in the month of May each year. Unreported changes to the application may invalidate the clearance given by the HREC (Medical).

Principal Investigator Signature

Date 11th Sept. 2017

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES

ADDENDUM 9

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
18th August 2017

Mr. Tikondwe Sichinga
University of the Witwatersrand
GP_2017RP12_757

Dear. Mr. Tikondwe Sichinga

RE: "Health-related Quality of life of Men with Hormonal Therapy for prostate Cancer"

Permission is granted for you to conduct the above recruitment activities as described in your request provided:

1. Charlotte Maxeke Johannesburg Academic hospital will not in anyway incur or inherit costs as a result of the said study.
2. Your study shall not disrupt services at the study sites.
3. Strict confidentiality shall be observed at all times.
4. Informed consent shall be solicited from patients participating in your study.
5.

Please liaise with the Head of Department and Unit Manager or Sister in Charge to agree on the dates and time that would suit all parties.

Kindly forward this office with the results of your study on completion of the research.

Supported / ~~not supported~~

Ms. M.M Pule
Nursing Director
Date: 2017/08/18

Approved / not approved

Ms. G. Bogoshi
Chief Executive Officer
22.08.2017