PROSTATE CANCER AWARENESS, KNOWLEDGE, PERCEPTION ON SELF-VULNERABILITY AND UPTAKE OF SCREENING AMONG MEN IN NAIROBI COUNTY, KENYA

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NOVEMBER, 2013
DECLARATION

This thesis is my original work and has not been presented for a degree in any other University.

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DEDICATION

I dedicate this thesis to my late Mum-Julia Wanjiku who died through a road accident, when I was writing my exams for this degree program.
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# ACROSYMS AND ABBREVIATIONS

<table>
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<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>ADT</td>
<td>Androgen Deprivation Therapy</td>
</tr>
<tr>
<td>DRE</td>
<td>Digital Rectal Examination</td>
</tr>
<tr>
<td>EN2</td>
<td>Homeobox Protein Engrailed-2</td>
</tr>
<tr>
<td>GLOBOCAN</td>
<td>Global Cancer Project</td>
</tr>
<tr>
<td>HIV</td>
<td>Human Immunodeficiency Virus</td>
</tr>
<tr>
<td>mRNA</td>
<td>Messenger Ribonucleic Acid</td>
</tr>
<tr>
<td>PC</td>
<td>Prostate Cancer</td>
</tr>
<tr>
<td>PSA</td>
<td>Prostate Specific Antigen</td>
</tr>
<tr>
<td>PSA3</td>
<td>Prostate Specific Antigen-3</td>
</tr>
<tr>
<td>STI</td>
<td>Sexually Transmitted Infection</td>
</tr>
<tr>
<td>TCDD</td>
<td>Dioxin Chemical</td>
</tr>
<tr>
<td>TRUS</td>
<td>Transrectal Ultrasound</td>
</tr>
<tr>
<td>UNAIDS</td>
<td>United Nations Joint Program on HIV/AIDS</td>
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<td>WHO</td>
<td>World Health Organization</td>
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OPERATIONAL DEFINITION OF TERMS

For the purpose of this study, the following terms are defined as follows:

**Awareness** is the state or condition of being aware of prostate cancer (i.e., ever heard of prostate cancer).

**Knowledge** is defined as having information on prostate cancer. The information includes; what the signs and symptoms are, and treatment and prevention modalities for prostate cancer.

**Perception of self-vulnerability** is defined as the degree of optimism (i.e., respondent’s belief) in their insusceptibility and level of control of fear towards prostate cancer.

**Prostate cancer** is defined as a cancer that affects the male prostate gland.

**Uptake of prostate cancer screening** is defined as having ever been tested for prostate cancer by any of the common screening methods (i.e., direct rectal examination, prostate specific antigen and biopsy).
ABSTRACT

Prostate cancer is the number one cancer afflicting men in Africa and a leading cancer killer among Kenyan men. Although there is scarcity of information on the disease in African men, higher awareness with concomitant low levels on knowledge, attitudes and perception of self-risk to the disease were established among urban men in West Africa. In addition, uptake of prostate cancer screening by African men has remained extremely low despite the fact that early screening and detection is the most effective intervention tool for the disease. A lack of awareness and knowledge and poor perception on prostate cancer and prostate cancer screening, and a low uptake of screening appear to promote the increasing burden of the cancer. Most of the reports on prostate cancer from Kenya have largely been hospital-based hence little is known about prostate cancer in the community. Although prostate cancer is the leading cancer in Nairobi, awareness, knowledge and perceptions of the cancer including uptake of screening remains undetermined among men from the Nairobi community. As such, this household cross-sectional descriptive study was conducted among men (n=581) of age 30-73 years to evaluate the awareness and knowledge levels; perception of prostate cancer self-vulnerability and uptake of prostate cancer screening in Nairobi County. Data was collected using structured questionnaires and summarised using descriptive statistics and presented in tables and graphs. Statistical analyses for associations between knowledge levels, perception of self-vulnerability to prostate cancer, uptake of prostate cancer screening and socio-demographic characteristics were performed using the chi-square tests followed by Spearman’s correlation tests and binary logistic regression modeling. Results of this study show high prostate cancer awareness (84.6%). The frequency of respondents with good knowledge on prostate cancer was low at 52.3%. The frequency of good perception on self-vulnerability to prostate cancer was 58.0%. Respondents with poor knowledge on prostate cancer were older relative to those with good knowledge (P=0.001) and the knowledge levels on prostate cancer were positively correlated with perception of prostate cancer self-vulnerability (r=0.144; P=0.001). Binary logistic regression analyses revealed that good knowledge of prostate cancer was associated with university [OR, 18.741; 95% CI, 6.878-51.064; P<0.0001]; diploma [OR, 9.332; 95% CI, 3.752-23.213; P<0.0001]; and secondary education [OR, 4.078; 95% CI, 1.650-10.075; P=0.002]. Similarly, good perception of self-vulnerability to prostate cancer was associated with university [OR, 2.405; 95% CI, 1.121-5.162; P=0.024]; diploma [OR, 3.394; 95% CI, 1.699-6.780; P=0.001]; and secondary [OR, 1.832; 95% CI, 0.932-3.603; P=0.079] education. Only 4.1% of the respondents had ever been screened for prostate cancer. Consistent with the low uptake of prostate cancer screening, only 48.2% of the respondents were aware of prostate cancer screening; 7.1% of the respondents knew about the methods of prostate cancer screening; and 45.8% of the respondents knew about the frequency of prostate cancer screening. Moreover, proportions of respondents with good perception about self-vulnerability to prostate cancer were higher than those reporting ever being tested (79.2%) against those that had never been tested (57.1%) for prostate cancer (P=0.032). Of importance, 91.4% of the respondents were willing to take up prostate cancer screening and 97.2% of the respondents were willing to know more about prostate cancer screening. The results of this study demonstrate higher awareness but low
knowledge levels on prostate cancer that are accompanied by low perceptions on self-vulnerability to the cancer, low uptake of prostate cancer screening that parallel poor knowledge and perceptions on prostate cancer self-vulnerability and uptake of screening. Thus, public health intervention targeting information dissemination on prostate cancer; behavioural change on risk perceptions; and uptake of early screening of prostate cancer can halt the increasing burden of the disease.
CHAPTER ONE: INTRODUCTION

1.1 Background to the study

Prostate cancer (PC), an adenocarcinoma of the male prostate gland, is increasingly becoming an important health burden among men in the world (Ferlay et al., 2011; Lozano et al., 2012). An estimated 0.9 million cases and 0.26 million deaths of prostate cancer occur annually in the world (Ferlay et al., 2011). Prostate cancer is the number one cancer in both incidences and mortality in Africa, constituting 40,000 (13%) of all male cancer incidences and 28,000 (11.3%) of all male cancer-associated mortalities (Ferlay et al., 2011). In East Africa, prostate cancer ranks third in both incidence and mortality, and leads to an estimated 9,000 (9% of all male cancers) cases and 7,300 (8.5% of all male cancer) deaths annually (Ferlay et al., 2011). It is important to note that PC incidences increased by 64.5% between 1990 and 2010 (Lozano et al., 2012).

Although higher awareness levels on prostate cancer have previously been reported among Nigerian men aged 50 or more years, their knowledge levels on prostate cancer (i.e., symptoms and signs, detection, treatment, prevention and outcomes) were low (less than 40%) (Oladimeji, Bidemi, Olufisayo, & Sola, 2010). Similar studies in Senegal also showed low levels of specific knowledge on prostate cancer (Gueye et al., 2003; Punmaaole, Moningo, Kayembe, Tshikuela, & Kabongo, 2008). Although early detection is an integral component of a successful prostate cancer therapy, a majority (87.5%)
of the patients in Kenya present with advanced disease due to low awareness and a lack of early screening services (Magoha & Ngumi, 2000; MPHS & MMS, 2011; Wasike & Magoha, 2007). Several studies in Nairobi County also show that most prostate cancer patients report at hospital with advanced disease (Magoha & Ngumi, 2000; MPHS & MMS, 2011; Wasike & Magoha, 2007) but their awareness and knowledge levels on prostate are largely undefined.

Additional studies also show that perception on self-vulnerability is low among African men and is associated with low awareness and knowledge levels on the disease (Oladimeji et al., 2010) but perception on risk of prostate cancer has previously not been examined among Kenyan men. The Kenya cancer control strategy advocates for enhancing early detection and improving accessibility to diagnostic services for better treatment (MPHS & MMS, 2011). Furthermore, this strategy supports preventive interventions such as enhancing awareness and knowledge levels, promoting good perception on the disease for behavioural change, adopting healthy lifestyles and avoiding exposure to risky environmental carcinogens (MPHS & MMS, 2011). This study therefore assessed the awareness and knowledge levels, and perception of self-vulnerability to prostate cancer and uptake of prostate cancer screening among men in Nairobi County, Kenya.

While the Global Cancer Project (GLOBOCAN) study estimates the prevalence of prostate cancer in Kenya to be 1,087 (8.6%) of all male cancer
incidence, and 887 (8.1%) of all male cancer mortality cases (Ferlay et al., 2011), the national cancer control strategy estimates the figure to be 9.4% of all male cancers in Kenya (MPHS & MMS, 2011), but according to the latest ever documented report on cancer incidences in Nairobi, The Nairobi Cancer Registry, the rate of prostate cancer in the County was 9.4% in 2000 and 11.4% in 2002, respectively (KEMRI, 2006). Although there is scarcity of information on prostate cancer cases and deaths in Nairobi, earlier studies at Kenyatta National Hospital indicated that the cancer accounted for 56% of the penile and urological cancers diagnosed between 1970 and 1999 (Magoha & Ngumi, 2000). Subsequent studies showed a hospital incidence of 76.5/100,000 and a mortality rate of 5.8/100,000 (Wasike & Magoha, 2007).

1.2 Statement of the problem

In Sub-Saharan Africa, prostate cancer reports have been hospital-based and as such very few studies, have been conducted on indigenous populations. Unreliable data (due to the poor collation of data at the time) of 2000-2002 indicates a PC incidence of 9.4% of all cancers rising to 11.4% in Nairobi Province (KEMRI, 2006) Not surprising therefore, and not withstanding the increasing incidences and mortality resulting from prostate cancer in Kenya (Ferlay et al., 2011), there have been neither specific policies nor effective strategies for controlling the disease. One of the most effective intervention tools for prostate cancer is screening and early diagnosis (Magoha & Ngumi, 2000). However, the lack of knowledge on the disease and the low uptake of
routine screening among men most at risk (such as those in Nairobi County) of developing prostate cancer compounds the problem. In addition, little is known in Nairobi County about the factors predisposing men to increased risk of prostate cancer as well as hindering awareness and uptake of screening and early diagnosis. Moreover, limited studies in the capital of Nairobi and Kenya in general, have led to over-reliance on research findings from elsewhere in the world, despite the fact that risks and factors influencing the outcomes of the disease are largely different. Thus, there has been an urgent need to identify determinants of prostate cancer initially in the capital city for and hence this study.

1.3 Purpose of the study

This study identifies factors responsible for the lack of knowledge and screening in men residing in Nairobi County that can be utilized in further studies and the drafting of appropriate policies and designing of control strategies on the disease appropriate for Kenya. The findings of this study will contribute towards increased awareness and knowledge of prostate cancer amongst the Nairobi County men, and lead to early detection, improved management of the disease and reduced cost of patient care which should enhance the quality of lives for prostate cancer patients.
1.4 Objectives of the study

1.4.1 General objective

To determine the prostate cancer awareness, knowledge, perception on self-vulnerability, uptake of screening, and their associations with socio-demographic variables among men in Nairobi County, Kenya.

1.4.2 Specific objectives

i) To assess the awareness and knowledge levels towards prostate cancer among men in Nairobi County.

ii) To determine perception of self-vulnerability towards prostate cancer among men in Nairobi County.

iii) To establish the uptake levels of prostate cancer screening among men in Nairobi County.

iv) To examine the associations of awareness and knowledge levels, and perceptions of self-vulnerability towards prostate cancer with socio-demographic variables and uptake of prostate cancer screening among men in Nairobi County.
1.5 Research questions

i) What is the awareness and knowledge level on prostate cancer among men in Nairobi County?

ii) What is the perception of self-vulnerability towards prostate cancer among men in Nairobi County?

iii) What is the uptake level of prostate cancer screening among men in Nairobi County?

iv) What is the association of awareness and knowledge levels, and perceptions of self-vulnerability towards prostate cancer with socio-demographic variables and uptake of prostate cancer screening among men in Nairobi County?

1.6 Hypotheses

i) Awareness, knowledge and perception on self vulnerability to PC do not influence the uptake of PC screening among men in Nairobi County.

ii) Socio-demographic factors (age, education, marital status, religion, and occupation) do not influence PC awareness, knowledge, perception on self vulnerability on PC and uptake of PC screening among men in Nairobi County.
1.7 Significance of this study

This is a key study that shows the awareness and knowledge levels, and perception of self-vulnerability to prostate cancer and uptake of screening for prostate cancer among men in Nairobi County. The results of this study calls for urgent health measures aimed at promoting specific knowledge levels on prostate cancer and calls for encouraging behavioural changes towards avoiding risks for the development of prostate cancer in men. The study further calls for the design of novel screening strategies for prostate cancer across the country, as early screening for PC has been shown to contribute significantly to the management of the disease (MPHS & MMS, 2011). It is further hoped that the data and information generated will also be used by local cancer bodies, the Kenya national cancer control strategy, the Kenya cancer association, academicians, scientists and medics for developing policies for control and prevention of prostate cancer in Kenya. The recommendations of this study on improving uptake of screening and promoting information dissemination on prostate cancer, should also go along way in significantly improving the efficient and effective health management of prostate cancer at all stages.
1.8 Limitations of this study

Sampling of respondents for this study was not conducted among men residing in the informal settlements and among gated homes that denied access, and income levels were not obtained from the respondents in this study. In order to increase the authenticity of the study, employment and occupation status were used as surrogate for income and residence.

1.9 Assumptions of the study

The study assumption was that, there were low education levels and poor perceptions on self-vulnerability to prostate cancer that led to low knowledge levels and uptake of screening for prostate cancer among men in Nairobi County.

1.10 Conceptual framework

Various studies confirm significant deficits in awareness and knowledge about prostate cancer and the available treatment options (Arafa, Rabah, & Wahdan, 2012; Ngugi & Magoha, 2007; Oladimeji et al., 2010; Rebbeck et al., 2013). Whilst age, education, prior exposure to prostate cancer (family member, friend or self having the disease) or having had a previous examination had no impact on knowledge of prostate cancer, these factors were associated with an increased awareness of prostate cancer treatment options and side effects (Ajape, Babata, & Abiola, 2009). Older age groups also influence awareness on treatments for prostate cancer with younger age groups having higher
knowledge levels on prostate cancer. Among the socio-economic factors, middle socio-economic status is associated with a greater willingness to participate in prostate cancer screening due to greater knowledge of the disease and screening procedures. Other factors that influence uptake of prostate cancer screening include: limited knowledge of the disease, lack of access to screening services, beliefs, attitudes, embarrassment and fear of a positive diagnosis. Moreover, levels of knowledge and attitude on prostate cancer, and socio-demographic factors including age, family history, income, educational levels, health seeking behaviour, life-styles, diet and the living and working environment greatly impact on the awareness, knowledge, perception on self-vulnerability on prostate cancer and uptake of prostate cancer screening (Arafa et al., 2012; Dolan et al., 2004). Awareness, knowledge, perception on self-vulnerability and uptake of prostate cancer are therefore closely related to and associated with socio-demographics of men at the age at risk for prostate cancer and consequently the level and intensity of burden of the disease to society.
Figure 1.1. Interaction of awareness, knowledge and perception of self-vulnerability and uptake of screening for prostate cancer

Redesigned from (Nanton & Dale, 2011; Oladimeji et al., 2010).
CHAPTER TWO: LITERATURE REVIEW

2.1 Aetiology of prostate cancer

Pathological abnormalities occur more frequently in the prostate than elsewhere in human males. These changes increase in prevalence with increasing age and include benign prostatic hyperplasia and adenocarcinoma. Prostate cancer is an adenocarcinoma that may be slow growing, aggressively evolving and metastising predominantly in the bones and lymph nodes (Grover & Martin, 2002). Prostate cancer causes pain, difficulty in urinating, anomalies of sexual intercourse and erectile dysfunction. Globally, prostate cancer is the eleventh leading cause of death from cancer in all age groups and the sixth leading cause of cancer-related deaths in men (Ferlay et al., 2011; Lozano et al., 2012). Development of prostate cancer is influenced by ethnic and genetic differences, and global distribution. In addition, androgens and ageing, environment, meat and animal fat intake among other factors are important risk factors for prostate cancer development (Grover & Martin, 2002).

2.2 Epidemiology of prostate cancer

Prostate cancer is the second most frequently diagnosed male cancer in the world (899,000 cases or 13.6% of male cancers) and the fifth most common cancer (Ferlay et al., 2011). Nearly three-quarters of the registered cases occur in developed countries (644,000 cases) (Ferlay et al., 2011). Incidence rates of prostate cancer vary by region and continent, largely due to differences in the uptake of the practice of prostate cancer screening and subsequent biopsy that
are widespread in Europe and North America (Ferlay et al., 2011; Lozano et al., 2012). Incidence rates are relatively high in certain developing regions such as the Caribbean, South America and Sub-Saharan Africa (Ferlay et al., 2011; Lozano et al., 2012). With an estimated 258,000 deaths in the world in 2008, prostate cancer is the sixth leading cause of death from cancer in men (6.1% of all cancers) (Ferlay et al., 2011; Lozano et al., 2012). Mortality rates are generally high in predominantly black populations (Caribbean, 26.3/100,000 and Sub-Saharan Africa, 18-19/100,000), very low in Asia, and intermediate in Europe and Oceania (Ferlay et al., 2011; Lozano et al., 2012). In 2008, the European union recorded 323,000 cases with 71,000 deaths; South America had 334,000 cases with 76,000 deaths; United States recorded 186,000 cases with 28,000 deaths; India reported 14,000 cases and 10,000 deaths; Japan had 39,000 cases; while China recorded 33,000 cases and 14,000 deaths (Ferlay et al., 2011; Lozano et al., 2012).

Although the national cancer registry estimates prostate cancer prevalence of 9.4% in Kenya (MPHS & MMS, 2011), the three East African countries (Kenya, Uganda and Tanzania) recorded a total of 3,391 incidences consisting of 1,087 cases in Kenya; 1,538 cases in Uganda and 766 cases in Tanzania and a mortality rate of 2,755 (Kenya: 881; Tanzania: 625 and Uganda: 1,249) (Ferlay et al., 2011; Lozano et al., 2012).
In Sub-Saharan Africa, prostate cancer reports have been hospital based and as such very few studies have been conducted on the indigenous populations. Initially, it was alleged that Africans in Africa rarely developed prostate cancer, due to short life expectancy, high fibre diet, low levels of fat and liver diseases (Angwafo et al., 2003). However, other studies observed that prostate cancer was fast increasing with age, more than any other malignancy and was poised to become a major public health problem in Sub-Saharan Africa, as life expectancy increases (Okobia, 2003). Additional studies in rural Cameroon (Angwafo et al., 2003) showed that 3 out of 34 enrolled patients presented with prostate cancer while others (Ngugi & Byakika, 2007) found that among 108 hospital based cases at Kenyatta National Hospital, 26% had prostate cancer. Thus, contrary to earlier beliefs, prostate cancer is common and a major cause of morbidity and mortality in the countries of Africa. Other studies at this hospital also showed that a majority of prostate cancer patients undergo prostatectomy due to late presentation (Kalande, 2006), and this was attributed to poor referral system and a lack of adequate knowledge on prostate cancer in the Kenyan health care supply chain and management. Against an acknowledged poor information system by the compilers of the Nairobi Cancer Registry (KEMRI, 2006), prostate cancer is recorded as the second most common single-organ cancer at 9.4% after oesophagus at 10% in the year 2000, and increasing to 11.4% and 12.0%, respectively in 2001. However, the report did not collect information on awareness, knowledge, perception and uptake of screening for prostate cancer (KEMRI, 2006).
2.3 Risk and predisposing factors for prostate cancer

The specific causes of prostate cancer remain unknown (Hsing & Chokkalingam, 2006). Whilst the primary risk factors include age and family history, other factors associated with the cancer include hormonal imbalances, the living and working environment, lifestyle and diet, men’s health seeking behaviour, sexually transmitted infections and exposure to certain medications (Grover & Martin, 2002). Prostate cancer is uncommon in men younger than 40 years, but becomes more common with advancing age (Ngugi & Magoha, 2007). However, most men are ignorant of their prostate cancer status.

2.3.1 Age

The lifetime risk of developing prostate cancer for men is 1 in 6 (Ngugi & Magoha, 2007). In the United States, 96% of prostate cancers occur in men aged 55 years and above (Steele, Miller, Maylahn, Uhler, & Baker, 2000). (Hsing, Tsao, & Devesa, 2000) observed that prostate cancer occurs in 30% of men at 50 years and in 90% at 90 years during autopsy. Moreover, autopsy studies among Chinese, German, Israeli, Jamaican, Swedish, and Ugandan men who died from other causes indicated that prostate cancer was present in 30% of men aged 50-59 years old, and 8% in men of age 70-79 years old (Steele et al., 2000).

Previous prostate cancer histological studies following prostatectomy and ultrasound guided needle biopsy by (Ngugi & Byakika, 2007) involving 108
patients aged 48-83 years at the Kenyatta national hospital, the Nairobi hospital and Upper Hill medical centre illustrated that 76% of the patients had prostate hyperplasia and 26% presented with prostate cancer. These findings suggest that prostate cancer is common in men above 40 years of age in Kenya.

2.3.2 Genetics and heredity

Previous studies showed that prostate cancer was frequent in men with first degree members suffering the disease (Zeegers, Jellema, & Ostrer, 2003). Additional studies by (Parchment, 2004) showed that prostate cancer morbidity and mortality was common in black men (African Americans and Caribbean males) in the eastern coast of America. The study also showed that black men were routinely diagnosed with later stages of prostate cancer and had reduced survival rates (Parchment, 2004). Recent worldwide studies evaluating the characteristics of prostate cancer across four populations involving men from the USA (European Americans, African Americans), Senegal and India illustrated that men in the developing countries (Senegal and India) present with more advanced disease compared to men from the developed world (Zeigler-Johnson et al., 2008). Thus, it appears that familial relationship and black ethnicity are important genetic determinants of prostate cancer in the world. However, it is not known whether familial connection and ethnic backgrounds govern development of prostate cancer among Kenyan men.
2.3.3 Hormonal imbalances

Studies among 13 symptomatic testosterone deficient men with untreated prostate cancer on testosterone therapy showed that increased prostate cancer growth occurred at low androgen concentrations (Morgentaler, Rhoden, Guay, & Traish, 2010), suggesting that androgens are important hormonal determinants of prostate cancer development.

2.3.4 Environmental factors

Increased exposure to heavy metals such as cadmium from industries and cigarette smoking appears to increase the risk of prostate cancer. Previous studies among 295 men aged 50 and above years showed associations between elevated levels of PSA and levels of cadmium in the blood and urine (Wu, Pu, Wu, Yang, & Chen, 2011), suggesting that increased exposure to cadmium increases the risk of developing prostate cancer. Dioxin (chemically known as 2,3,7,8-tetrachlorodibenzo-\(p\)-dioxin, TCDD) was extensively used during the Vietnam war as a component of herbicides. Recent studies by (Shah et al., 2009) among patients with agent orange exposure showed that this agent was associated with the development of a more aggressive prostate cancer. Although compounds related to dioxin are still being used today in herbicides, it is not known whether this exposure increases the risk of prostate cancer.
2.3.5 Lifestyle and diet

A number of studies have identified important effects of nutrition in modulating protection and outcomes of prostate cancer. For instance, tomatoe lycopene, carotenoids, cruciferous vegetables, vitamin E, selenium, marine fish, omega-3 fatty acids, soya beans, isoflavones and polyphenols have been associated with protection while dairy products, calcium, zinc, saturated fats, grilled meats, and heterocyclic amines appear to increase the risk of prostate cancer (Grover & Martin, 2002). Additional studies indicate that plant-based diets and fish are associated with a reduced risk of developing prostate cancer (Chan, Gann, & Giovannucci, 2005). However, it is not known whether diet and lifestyle affect development of prostate cancer in Kenya.

2.3.6 Awareness, knowledge and perceptions on prostate cancer and uptake of screening

Previous studies in United States indicated that patterns of change for all screening modalities for cancer differed by age, gender, racial and ethnic background, but prevalence of use within recommended time intervals, was consistently lower among groups with less education and hence lower knowledge levels (Breen, Wagener, Brown, Davis, & Ballard-Barbash, 2001). In a similar study within the United States, exposure to prostate cancer information significantly predicted screening participation (Nivens, Herman, Pweinrich, & Weinrich, 2001). Although older Nigerian men had high awareness rates on prostate cancer, their low knowledge of the aetiology,
treatment, and prevention; perception on the risk of developing the disease and uptake of screening was low (Oladimeji et al., 2010). However, even though knowledge and risk perception of prostate cancer were low, most of this men were willing to be screened for the disease (Oladimeji et al., 2010). However, other studies (Ajape et al., 2009) among a native urban Nigerian population (with less than average education) showed that a large proportion of the men were unaware of prostate cancer including screening for the disease using the PSA method. Recent studies among Indian patients also showed that most men were unaware of the treatment options and their outcomes (Xu, Neale, Dailey, Eggly, & Schwartz, 2012). Accordingly, promoting dissemination of information on prostate cancer can improve perceptions on the disease, leading to enhanced uptake of screening for early detection.

2.3.7 Health seeking behaviour

The health-seeking behaviour of a people determines their personal health practices and seeking of medication when sick as well as the health of other family members. Although men, as family heads, determine decisions regarding their health and that of the households (UN, 2011), their participation in the public health sector which is often lacking, can be improved through men's clinics, and merging health services such as HIV counseling and testing with screening and treatment for prostate or testicular cancer (Crum, Spencer, & Amling, 2004). Similar studies among black American men showed that worsening urinary symptoms and accompanying bother, were associated with
health care seeking behaviour (Sarma, Wallner, Jacobsen, Dunn, & Wei, 2008). Taken together, these studies suggest that enhanced health information, participation in health decisions and disease manifestations promote men’s health seeking behaviour.

**2.3.8 Sexually transmitted infections**

A number of sexually transmitted infections have been associated with an increased risk of prostate cancer. For instance, studies by (Olusoga, Adedapo, Okafor, & Daini, 2007) at the Nigerian university college hospital, Ibadan showed associations between syphilis and high PSA levels. Other studies by (Stark et al., 2009) indicated associations between *Trichomonas vaginalis* infection and increased risk of prostate cancer, advanced disease (Stage 4) and death due to prostate cancer. Additional studies also showed that men with multiple sexual partners had an increased risk of prostate cancer (Rosenblatt, Wicklund, & Stanford, 2001). Although no causal relationship has been established between sexually transmitted infections and prostate cancer, it is possible that sexually transmitted infections and having multiple sexual partners that are frequently observed in sexually active men in the country may be contributing to the increasing prostate cancer problem in Kenya.

**2.3.9 Exposure to medication**

Some links have been established between prostate cancer and medications, medical procedures, and medical conditions (Jacobs et al., 2005). It however
remains to be ascertained whether medications and other medical procedures promote the risk of prostate cancer in Kenya.

2.4 Diagnosis, detection and screening of prostate cancer

Although several methods are available for diagnosis of prostate cancer, biopsy removal and microscopic examination is the only confirmatory method (Javali et al., 2013). However, prior to a biopsy, several other tools are used to determine the condition of the prostate and the urinary tract. For instance, digital rectal examination is used for detecting prostate abnormalities. Cystoscopy is used for examining the bladder using a thin, flexible camera tube inserted down the urethra and trans-rectal ultra-sonography creates a picture of the prostate using sound waves from a probe in the rectum (Marks, 2009).

2.4.1 Clinical diagnosis

History taking and clinical examination of patients can aid in suspecting for prostate cancer. This clinical process is usually based on the presence of signs and symptoms suggestive of a diseased prostate such as prostatitis, an infection, usually caused by bacteria; benign prostatic hyperplasia, an enlarged prostate, which may cause dribbling after urination or frequent urination, especially at night. The main method of prostate examination include Direct Rectal Examination for genitourinary symptoms (Marks, 2009), and painful hematuria associated with abdominal pain, flank pain, suprapubic pain or dysuria (Marks, 2009).
2.4.2 Histological investigations

The most commonly used system of classifying the histologic characteristics of prostate cancer is the Gleason score, which is determined using the glandular architecture within the tumour. If cancer is suspected in the prostate gland, a biopsy is offered expediently. Previous studies in Kenya showed that most patients reporting with advanced prostate cancer presented with prostate hyperplasia (Ngugi & Byakika, 2007).

2.4.3 Laboratory diagnosis

There are a number of laboratory tests used in the diagnosis and confirmation of prostate cancer.

2.4.3.1 Prostate-specific antigen

PSA is a protein produced by the cells of the prostate gland. PSA is present in small quantities in the serum of men with healthy prostates, but is often elevated in the presence of prostate cancer and in other prostate disorders. Rising levels of PSA over time are associated with both localized and metastatic prostate cancer (Andriole et al., 2009; Roobol et al., 2009).

2.4.3.2 Prostate cancer antigen-3

Prostate cancer antigen (PCA)-3 is a non-invasive method of early prostate tumour detection through a molecular test that detects the presence of cell-
associated PCA-3 mRNA in fluid massaged from the prostate and first-void urine (Zhou et al., 2011). Studies indicating associations between higher PCA-3 scores and aggressive disease (Auprich et al., 2011) suggest that this technique may be valuable in the staging of the disease and monitoring treatment outcomes.

2.4.3.3 **Homeobox protein engrailed-2**

This method is based on detection of the homeobox protein engrailed (EN)-2 in urine. Studies have shown that presence of homeobox protein EN2 in urine is associated with an increased risk of prostate cancer (Morgan et al., 2011). This technique, however, is still undergoing further testing.

2.4.4 **Importance of early screening**

In developed countries, screening for PSA has led to early detection and management of the disease. However, in developing countries particularly in Africa, routine screening has remained low, leading to reduced detection rates, poor management and increased mortality from the disease (Ajape et al., 2009). Recent studies in Ghana among 196 men visiting the outpatient Department of Komfo Anokye Teaching Hospital showed that 83.6% had elevated PSA levels and 95.5% had prostate cancer (Rebbeck et al., 2013). Additional studies on 156 Nigerian men showed a lack of awareness on prostate cancer, prostate cancer screening and serum PSA test for screening (Ajape et al., 2009). Studies in Kenya on 108 patients established associations
between high levels of PSA and increased rates of prostate cancer in biopsy samples (Ngugi & Byakika, 2007). In addition, (Magoha & Ngumi, 2000) suggested that early diagnosis is pre-requisite for effective therapy of prostate cancer. Moreover, the present screening techniques including DRE, PSA, transrectal ultrasound (TRUS) and random ultrasonically guided multiple prostatic biopsies can detect some potentially curable asymptomatic localized cancers (Zeigler-Johnson et al., 2008). A review by (Ngugi & Magoha, 2007) also indicated that increased detection of early prostate cancer is due to widespread use of PSA screening in the world.
CHAPTER THREE: MATERIALS AND METHODS

3.1 Research design

This was a cross-sectional descriptive study among male respondents in Nairobi County. Quantitative approaches through structured questionnaires were used to collect data on demographic, socio-economic, awareness and knowledge on prostate cancer, perception on self-vulnerability to prostate cancer, and uptake of prostate cancer screening.

3.2 Study variables

The independent (predictor) variables assessed in this study were age, education levels, occupation, religion and marital status.

The dependent (outcome) variables in this study included: awareness and knowledge on prostate cancer, perception on self-vulnerability to prostate cancer, and uptake of prostate cancer screening.

3.3 Location of the study

The study was conducted in Nairobi County (Appendix C) and the sample was drawn from the then 8 constituencies of Nairobi. The population of Nairobi as per the 2009 census (KNBS, 2010) was 2,320,000 (8% of the total Kenyan population) with men accounting for about 49% of the population. The city occupies an area of 689² km. Nairobi is a metropolis with representation of all the ethnic groups in Kenya and the world.
3.4 Target population

The target population comprised adult males of at least thirty years of age resident in Nairobi County.

3.4.1 Study population

The study population comprised adult males living in Nairobi and aged at least thirty years. Although an age of forty years has been reported as the age at risk for PC (KEMRI, 2006), the age at risk for PC in Nairobi County is unknown, hence thirty years was the minimum age of entry into this study since at this age most men in have at least high school education and therefore aware of PC. These men were selected at households without screening whether or not they had taken prostate screening test or had been diagnosed with prostate cancer.

3.4.1.1 Inclusion criteria

a) Adult males who had lived in Nairobi for at least one year and were at least thirty years of age.

b) Adults males who consented to participate in the study.

3.4.1.2 Exclusion criteria

a) Adults males who refused consent to participate in the study.

b) Adult males who had lived in Nairobi for less than 1 year and those who were less than 30 years of age.
c) Females of any age.

3.5 Sampling techniques and sample size

3.5.1 Sampling techniques

The study utilised a stratified random sampling method for obtaining respondents for interviewing. First, Nairobi county was purposively selected as the study area. Secondly, the study participants were proportionately distributed across the previous eight constituencies of Nairobi County (Table 3.1). Within each constituency, the respondents were proportionately distributed across at location level (repsented by Chiefs’ camps).
Table 3.1. Proportionate distribution of study respondents in Nairobi County

<table>
<thead>
<tr>
<th>Constituency</th>
<th>Male Population</th>
<th>% of population</th>
<th>Sample</th>
<th>Number of chiefs camps</th>
<th>*Sample per chief’s camp</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dagoretti</td>
<td>166,391</td>
<td>10.4</td>
<td>60</td>
<td>4</td>
<td>15</td>
</tr>
<tr>
<td>Embakasi</td>
<td>468,097</td>
<td>29.2</td>
<td>170</td>
<td>11</td>
<td>15</td>
</tr>
<tr>
<td>Kamukunji</td>
<td>136,920</td>
<td>8.5</td>
<td>50</td>
<td>3</td>
<td>17</td>
</tr>
<tr>
<td>Kasarani</td>
<td>266,684</td>
<td>16.6</td>
<td>96</td>
<td>6</td>
<td>16</td>
</tr>
<tr>
<td>Lang'ata</td>
<td>185,836</td>
<td>11.6</td>
<td>67</td>
<td>4</td>
<td>17</td>
</tr>
<tr>
<td>Makadara</td>
<td>114,457</td>
<td>7.1</td>
<td>41</td>
<td>3</td>
<td>14</td>
</tr>
<tr>
<td>Starehe</td>
<td>142,097</td>
<td>8.9</td>
<td>52</td>
<td>3</td>
<td>17</td>
</tr>
<tr>
<td>Westlands</td>
<td>124,748</td>
<td>7.8</td>
<td>45</td>
<td>3</td>
<td>15</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,605,230</strong></td>
<td><strong>100%</strong></td>
<td><strong>581</strong></td>
<td><strong>38</strong></td>
<td>-</td>
</tr>
</tbody>
</table>

Source: Kenya population and housing data census, 2009 (KNBS, 2010). *the number of respondents were uniformly distributed in each location at the chief camps within each constituency.
3.5.1.1 Household selection

All interviews were conducted within households using the face-to-face method. From the chiefs camp’s, two research assistants walked in opposite directions and selected all households along the transect for administering the questionnaires for each chief’s camp jurisdiction.

3.5.1.2 Respondent selection

Within each household, the birth day rule was used for selecting the eligible respondent(s). Only one respondent with the most recent birth day was selected for administering the questionnaire per household. In cases with absentee household members, the research assistant made at least three separate visits for the questionnaire administration.

3.5.2 Sample size determination

The sample size was determined based on the formula of (Rosner, 2011) for binomial probability exact methods for one sample tests as follows:

\[
 n = \frac{p_0 (1 - p_0) [z_\alpha^2 + (z_1 - \beta)^2 \sqrt{\frac{p_1(1-p_1)}{p_0(1-p_0)}}]}{(\epsilon)^2}
\]

Where:

\( p_0 = \) awareness levels in Nigerian men ≥50 years was 80% (Oladimeji et al., 2010)
\( p_1 = \) Since awareness levels on prostate cancer have previously not been determined for men in Kenya, it was assumed based on 80% awareness levels in Nigerian men (Oladimeji et al., 2010) that awareness levels among Kenyan men is at least 75%.

\( \alpha = \) probability of type I error and \( z_\alpha = 1.96 \) (at \( \alpha = 5\% \) 2-tailed)

\( \beta = \) probability of type II error and \( z_{1-\beta} = -0.157 \) (at 83% power 2-tailed)

\( \kappa = 0.03 \) (sum of binomial probabilities for exact methods for one sample tests)

\( n = \frac{0.517}{0.0009} \)

\( n = 574 \)

1\% (n=6) of the sample was added to cater for incomplete responses. This figure was chosen because 100\% response was obtained during the pilot study and it was anticipated that similar response would be achieved during the study. Therefore, 581 respondents were enrolled into this study.

### 3.6 Data collection techniques

The data was collected through questionnaires with structured questions administered to the adult males 30 years and above within each household. The structured questions provided data that was objective and reliable for hypothesis testing. The principle researcher co-ordinated and ensured that the data collection process was properly administered. Research assistants were carefully selected and trained on how to administer the questionnaires. The data collection instrument though in English (Appendix A) was carefully discussed in Kiswahili case of language barriers (Appendix B).
3.7 Construction of research instruments

For the target male population, a structured questionnaire with closed-ended questions was used for data collection (Appendix A&B). The questions were simple and straightforward for ease of response by the respondents. The instrument captured information on demographic, socio-economic, religious affiliation, awareness and knowledge on prostate cancer, perception on self-vulnerability to prostate cancer, and uptake of prostate cancer screening.

3.8 Pre-testing of research instruments

The study tool was pre-tested at Goigwa estate, Thika town. This area was chosen because it has similar social and demographic distribution as Nairobi. A total of 10 males were interviewed for the pre-test phase. This pilot phase tested the accuracy and clarity of the questionnaires and modifications were effected on questions found to be ambiguous.

3.8.1 Validity

The validity of a test is the extent to which a test (i.e., questionnaires in this study) measures the variables under study. Validity ensures accurate application and interpretation of the results of a study. In this study, validity was achieved by cross-checking, inspecting and scrutinizing the information entered in the questionnaires and this ensured that the data collected was accurate, relevant, complete, consistent and homogenous.
3.8.2 Reliability

Reliability is the consistency of a measure that ensures consistency of a test. In this study, reliability of the questionnaires was ensured by designing closed-ended questions that measured awareness, knowledge, perception of self-vulnerability to prostate cancer, and uptake of prostate cancer screening. The same set of questionnaires were administered to all the respondents at households giving responses that only differed by respondent characteristic rather than design effect. In addition, the conditions under which the measurements (i.e., administration of questionnaires) took place were standardized by minimizing external variations such as fatigue and boredom. This was further reinforced by thorough briefing, supervising of the research assistants, and cross-checking entries on the questionnaires in the field.

3.9 Logistical and ethical considerations

Approval for this study was obtained from Kenyatta University Graduate School and a permit was acquired from the National Council for Science and Technology through the Ministry of Higher Education, Science and Technology (Appendix E). The study was conducted in accordance with the guidelines of the Helsinki declaration. Ethical approval of this study was obtained from the Kenyatta university ethics review committee (Appendix D). Informed consent was obtained from the study respondents before recruitment.
into the study (Appendix F). Participation in the study was voluntary and confidentiality was maintained throughout the research process.

3.10 Data management and analysis

Data was dual entered, cleaned and coded in excel spreadsheets and exported into IBM® SPSS Statistics 19.0 (SPSS Inc. Chicago, USA) for data analyses. Knowledge levels were determined using a series of 8 questions on causes, treatment, prevention and effects of prostate cancer (i.e., respondent knows 1) the age at-risk of prostate cancer in men; 2) the signs and symptoms of prostate cancer; 3) that prostate cancer is treatable; 4) of a mode(s) of prostate cancer treatment; 5) that prostate cancer is preventable; 6) of a mode(s) of prostate cancer prevention; 7) of a person suffering from prostate cancer; and 8) of a person who has died from prostate cancer). Each correct response was assigned a score of 1.0 and each incorrect response was allocated a score of 0.0, then the overall score was calculated for all the eight knowledge responses for each individual. The maximum expected score was 8.0 and the mean (±standard deviation) value of 3.5 (±2.5) was used as the cut-off for defining good (values ≥mean) and poor (values below the mean) knowledge. Perception of self-vulnerability to prostate cancer was assessed using ten statements on a 5-point Likert scale: +5 (strongly agree) to +1 (strongly disagree) for positive statements, and +5 (strongly disagree) to +1 (strongly agree) for negative statements. The positive statements were: 1) respondent believes that they are at a higher risk of getting prostate cancer than other
men; 2) respondent believes that they are likely to get prostate cancer in future; 3) respondent believes that some people fear dying from prostate cancer if they get to know their status; 4) respondent believes that prostate cancer may be present without showing pain or symptoms; and 5) respondent believes that diet determines risk of prostate cancer; and the negative statements were: 1) respondent believes that there is no prevention of prostate cancer; 2) respondent believes that if they get prostate cancer, they will die within 5 years; 3) respondent believes that there is no treatment for prostate cancer; 4) respondent believes that prostate cancer kills even if diagnosed early or treated; and 5) respondent believes that regular checking for prostate cancer indicates that one has prostate cancer. The perception towards self-vulnerability was defined based on the mean (34.1) of the cumulative Likert scores as follows: good perception was defined by values ≥ mean and poor perception was based on values below the mean. Age was summarised as medians (range) and compared between groups (i.e., good vs. poor knowledge; good vs. poor perception, etc) using the Mann Whitney tests. Categorical variables such as socio-demographics factors were summarised as proportions and compared between groups using the Pearson’s chi-square tests. Associations between levels of knowledge (i.e., cumulative scores for each individual from the 8 questions) and perception of self-vulnerability (cumulative Likert scores for each individual from the 10 statements) on prostate cancer was examined using the Pearson’s correlation test. Knowledge vs. perception Pearson’s correlation analysis. In order to identify factors
independently associated (predictors) with the dependent variables (i.e., good and poor knowledge of prostate cancer, and perception of self-vulnerability to prostate cancer and uptake of prostate cancer screening), all variables significant in the univariate analyses (i.e., Mann whitney tests, chi-square and Pearson’s correlation analysis) at $P<0.100$ were entered into binary logistic regression modeling and controlled for the confounding effect of age. Age was controlled for because age at risk of PC has been reported as forty years followed by increased morbidity and mortality as men advance towards seventy years (KEMRI, 2006), and given the fact that awareness, knowledge and perception to PC increases with age (Breen et al., 2001). All tests were two-tailed and an alpha-value of 5% used for statistical inferences.
CHAPTER FOUR: RESULTS

4.1 Socio-demographic characteristics of the study participants

The socio-demographic characteristics of the study participants are summarized in Table 4.1. The response rate to the questionnaires was 100% of the 581 respondents interviewed. The respondents had a median (range) age of 38.0 with a range of 30.0-73.0 years and their age distribution was as follows: 30-39 years, (60.7%); 40-49 years, (26.9%); and ≥50 years, (12.4%). A majority of the respondents (96.2%) were christians consisting of 62.1% protestants and 34.1% catholics. Other religious affiliations reported were: 2.1% Muslim; 1.2% and 0.5% traditional religions. Majority of the respondents 81.8% were married and 18.2% were in single unions (i.e., single, 15.8%); separated, 1.5% or widowed, 0.9%. The distribution of education levels showed that 92.5% of the respondents had at least secondary level education [i.e., university, 14.8%; diploma, 37.3%; secondary, 40.5%; and primary, 7.2%] with one respondent having no education. The distribution of occupation types also varied among the respondents with most of the respondents (60.4%) reporting being in formal employment; (33.4%) were engaged in business; and 6.2% were unemployed (Table 4.1).
Table 4.1. Socio-demographic profiles of the study respondents

<table>
<thead>
<tr>
<th>Variable</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Median (range)</td>
<td>38.0 (30.0-73.0)</td>
<td></td>
</tr>
<tr>
<td>30-39</td>
<td>353</td>
<td>60.7</td>
</tr>
<tr>
<td>40-49</td>
<td>156</td>
<td>26.9</td>
</tr>
<tr>
<td>≥50</td>
<td>72</td>
<td>12.4</td>
</tr>
<tr>
<td>Religious affiliation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protestant</td>
<td>361</td>
<td>62.1</td>
</tr>
<tr>
<td>Catholic</td>
<td>198</td>
<td>34.1</td>
</tr>
<tr>
<td>Islam</td>
<td>12</td>
<td>2.1</td>
</tr>
<tr>
<td>Atheist</td>
<td>7</td>
<td>1.2</td>
</tr>
<tr>
<td>Traditionalists</td>
<td>3</td>
<td>0.5</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>475</td>
<td>81.8</td>
</tr>
<tr>
<td>Single</td>
<td>92</td>
<td>15.8</td>
</tr>
<tr>
<td>Separated</td>
<td>9</td>
<td>1.5</td>
</tr>
<tr>
<td>Widowed</td>
<td>5</td>
<td>0.9</td>
</tr>
<tr>
<td>Education level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>University</td>
<td>86</td>
<td>14.8</td>
</tr>
<tr>
<td>Diploma</td>
<td>217</td>
<td>37.3</td>
</tr>
<tr>
<td>Secondary</td>
<td>235</td>
<td>40.5</td>
</tr>
<tr>
<td>Primary</td>
<td>42</td>
<td>7.2</td>
</tr>
<tr>
<td>No education</td>
<td>1</td>
<td>0.2</td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Formal employment</td>
<td>351</td>
<td>60.4</td>
</tr>
<tr>
<td>Business</td>
<td>194</td>
<td>33.4</td>
</tr>
<tr>
<td>Unemployed</td>
<td>36</td>
<td>6.2</td>
</tr>
</tbody>
</table>

A total of 581 respondents were interviewed. Data are presented as the number (No.) of respondents and proportions (%) unless otherwise indicated.
4.2 Awareness levels on prostate cancer

Most of the respondents 84.6% were aware of prostate cancer disease and 16.4% were not aware of the disease (Figure 4.1). Three hundred and forty six of the respondents (59.5%) were aware that prostate cancer was a common disease that occurs in men, i.e., prevalent in men but 40.5% were unaware that prostate cancer was common in men (Figure 4.2). 91.6% of the respondents were aware that prostate cancer results in serious effects in men i.e., results in severe disease and death (Figure 4.3) but 8.4% were unaware of the consequences of the disease in men. A majority of the respondents reported receiving prostate cancer information from multiple sources (i.e., mass media, acquaintances and health practitioners) [56.8%] (Figure 4.4); but the mass media [40 (6.9%)]; acquaintances [34 (5.9%)]; and health practitioners [doctors, 7 (1.2%)] were also reported as sources of prostate cancer information.

![Figure 4.1 Awareness on prostate cancer disease](image_url)
Figure 4.2 Awareness on prostate cancer disease: Awareness levels on occurrence of prostate cancer

Figure 4.3. Awareness levels on effects of prostate cancer

Figure 4.4. Sources of information on prostate cancer
4.3 Knowledge levels on prostate cancer

Consistent with the high levels of awareness, a majority of the respondents [372 (64.0%)] were knowledgeable about the age at risk of prostate cancer (i.e., age ≥40 years). However, only 158 (27.2%) of the respondents were knowledgeable about the signs and symptoms of prostate cancer. Of these respondents, 89.2% reported difficulty urinating as an early warning sign of prostate cancer. The other signs and symptoms of prostate cancer reported included: blood in urine (19.0%), loss of libido (16.5%), bone pain (12.0%), and painful sex (10.8%) (Table 4.2 and Figure 4.5).

One hundred and sixty-eight (50.5%) of the total respondents were knowledgeable about prostate cancer treatment. While 76.2% of these respondents reported chemotherapy as a mode of treating prostate cancer, 66.1% reported radiotherapy, 46.4% mentioned surgical means and 1.8% reported herbal treatments as prostate cancer treatment approaches (Table 4.2 and Figure 4.6). Nearly half of the respondents [279 (48.0%)] reported that prostate cancer was a preventable disease. Regular screening (54.5%) and proper diet (54.1%) were frequently reported as preventive measures for prostate cancer (Table 4.2 and Figure 4.7). The overall mean (±standard deviation) knowledge score on causes, treatment, prevention and effects of prostate cancer was 3.5 (±2.5) out of a maximum of 8.0. This mean was used as the cut-off for good (values ≥mean) and poor (values below the mean)
knowledge. Thus, 304 (52.3\%) of the respondents had good knowledge and almost a half 277 (47.7\%) of the respondents had poor knowledge (Figure 4.8).
Table 4.2. Knowledge levels on prostate cancer

<table>
<thead>
<tr>
<th>Variable (Total N = 581)</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knows the age at-risk of prostate cancer in men</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;40 years</td>
<td>47</td>
<td>8.1</td>
</tr>
<tr>
<td>≥40 years</td>
<td>372</td>
<td>64.0</td>
</tr>
<tr>
<td>Don't know</td>
<td>162</td>
<td>27.9</td>
</tr>
<tr>
<td>知晓前列腺癌的年龄风险</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;40岁</td>
<td>47</td>
<td>8.1</td>
</tr>
<tr>
<td>≥40岁</td>
<td>372</td>
<td>64.0</td>
</tr>
<tr>
<td>不知道</td>
<td>162</td>
<td>27.9</td>
</tr>
<tr>
<td>Knows the signs and symptoms of prostate cancer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>158</td>
<td>27.2</td>
</tr>
<tr>
<td>No</td>
<td>423</td>
<td>72.8</td>
</tr>
<tr>
<td>知晓前列腺癌的症状和体征</td>
<td></td>
<td></td>
</tr>
<tr>
<td>是</td>
<td>158</td>
<td>27.2</td>
</tr>
<tr>
<td>否</td>
<td>423</td>
<td>72.8</td>
</tr>
<tr>
<td>Knows that prostate cancer is treatable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>333</td>
<td>57.3</td>
</tr>
<tr>
<td>No</td>
<td>248</td>
<td>42.7</td>
</tr>
<tr>
<td>知晓前列腺癌是可以治疗的</td>
<td></td>
<td></td>
</tr>
<tr>
<td>是</td>
<td>333</td>
<td>57.3</td>
</tr>
<tr>
<td>否</td>
<td>248</td>
<td>42.7</td>
</tr>
<tr>
<td>Knows of a mode(s) of prostate cancer treatment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>168</td>
<td>50.5</td>
</tr>
<tr>
<td>No</td>
<td>165</td>
<td>49.5</td>
</tr>
<tr>
<td>知晓前列腺癌的治疗方式</td>
<td></td>
<td></td>
</tr>
<tr>
<td>是</td>
<td>168</td>
<td>50.5</td>
</tr>
<tr>
<td>否</td>
<td>165</td>
<td>49.5</td>
</tr>
<tr>
<td>Knows that prostate cancer is preventable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>279</td>
<td>48.0</td>
</tr>
<tr>
<td>No</td>
<td>302</td>
<td>52.0</td>
</tr>
<tr>
<td>知晓前列腺癌是可以预防的</td>
<td></td>
<td></td>
</tr>
<tr>
<td>是</td>
<td>279</td>
<td>48.0</td>
</tr>
<tr>
<td>否</td>
<td>302</td>
<td>52.0</td>
</tr>
<tr>
<td>Knows of a mode(s) of prostate cancer prevention</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>272</td>
<td>97.5</td>
</tr>
<tr>
<td>No</td>
<td>7</td>
<td>2.5</td>
</tr>
<tr>
<td>知晓前列腺癌的预防方式</td>
<td></td>
<td></td>
</tr>
<tr>
<td>是</td>
<td>272</td>
<td>97.5</td>
</tr>
<tr>
<td>否</td>
<td>7</td>
<td>2.5</td>
</tr>
<tr>
<td>Knows of a person suffering from prostate cancer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>267</td>
<td>46.0</td>
</tr>
<tr>
<td>No</td>
<td>314</td>
<td>54.0</td>
</tr>
<tr>
<td>知晓患有前列腺癌的人</td>
<td></td>
<td></td>
</tr>
<tr>
<td>是</td>
<td>267</td>
<td>46.0</td>
</tr>
<tr>
<td>否</td>
<td>314</td>
<td>54.0</td>
</tr>
<tr>
<td>Knows of a person who has died from prostate cancer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>165</td>
<td>28.4</td>
</tr>
<tr>
<td>No</td>
<td>416</td>
<td>71.6</td>
</tr>
<tr>
<td>知晓患有前列腺癌死亡的人</td>
<td></td>
<td></td>
</tr>
<tr>
<td>是</td>
<td>165</td>
<td>28.4</td>
</tr>
<tr>
<td>否</td>
<td>416</td>
<td>71.6</td>
</tr>
</tbody>
</table>

A total of 581 respondents were interviewed. Data are presented as the overall number (No.) of subjects and proportions (%) with knowledge on the variables.
Figure 4.5. Proportion of respondents knowledgeable about the different prostate cancer signs and symptoms

- Difficulty in urinating: 89.2%
- Blood in urine: 19.0%
- Loss of libido: 16.5%
- Bone pain: 12.0%
- Painful sex: 10.8%
- Infertility: 4.4%

Figure 4.6. Proportion of respondents knowledgeable about the different prostate cancer treatment modes

- Chemotherapy: 76.2%
- Radiotherapy: 66.1%
- Surgery: 46.4%
- Herbal medicine: 1.8%
Figure 4.7. Proportion of respondents knowledgeable about the different prostate cancer prevention methods

Figure 4.8. Proportion of respondents with poor and good knowledge on prostate cancer
4.4 Perception of self-vulnerability to prostate cancer

The overall average proportions of the respondent’s Likert scores about beliefs on causes, diagnosis, treatment and prevention of prostate cancer were: strongly agree (9.4%), agree (35.6%), don’t know (3.2%), disagree (40.9%) and strongly disagree (10.9%) (Table 4.3). In addition, the mean (±standard deviation) of the cumulative Likert scores on the perception scores for beliefs on causes, treatment and prevention of prostate cancer was 34.1 (±4.4); and the median (range) was 34.0 (18.0-45.0) out of a maximum of 50.0. The mean was therefore used as the cut-off for good (values ≥mean) and poor (values below the mean) perception on self-vulnerability to prostate cancer. Thus, 337 (58.0%) of the respondents had good perception and 244 (42.0%) of the respondents had poor perception (Table 4.3).
Table 4.3. Perception of self-vulnerability to prostate cancer

<table>
<thead>
<tr>
<th>Variable</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Don’t know</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respondent believes that they are at a higher risk of getting PC than other men</td>
<td>9 (1.6)</td>
<td>117 (20.1)</td>
<td>10 (1.7)</td>
<td>320 (55.1)</td>
<td>125 (21.5)</td>
</tr>
<tr>
<td>Respondent believes that they are likely to get PC in future</td>
<td>8 (1.4)</td>
<td>201 (34.6)</td>
<td>18 (3.1)</td>
<td>279 (48.0)</td>
<td>75 (12.9)</td>
</tr>
<tr>
<td>Respondent believes that some people fear dying from PC if they get to know their status</td>
<td>109 (18.8)</td>
<td>312 (53.7)</td>
<td>17 (2.9)</td>
<td>119 (20.5)</td>
<td>24 (4.1)</td>
</tr>
<tr>
<td>Respondent believes that PC may be present without showing pain or symptoms</td>
<td>166 (28.6)</td>
<td>283 (48.7)</td>
<td>26 (4.5)</td>
<td>85 (14.6)</td>
<td>21 (3.6)</td>
</tr>
<tr>
<td>Respondent believes that diet determines risk of PC</td>
<td>67 (11.5)</td>
<td>335 (57.7)</td>
<td>21 (3.6)</td>
<td>132 (22.7)</td>
<td>26 (4.5)</td>
</tr>
<tr>
<td>Respondent believes that there is no prevention of PC</td>
<td>13 (2.2)</td>
<td>129 (22.2)</td>
<td>20 (3.5)</td>
<td>337 (58.0)</td>
<td>82 (14.1)</td>
</tr>
<tr>
<td>Respondent believes that if they get PC, they will die within 5 years</td>
<td>14 (2.4)</td>
<td>104 (17.9)</td>
<td>19 (3.3)</td>
<td>358 (61.6)</td>
<td>86 (14.8)</td>
</tr>
<tr>
<td>Respondent believes that if one already has PC, it is too late to get treatment</td>
<td>12 (2.1)</td>
<td>108 (18.6)</td>
<td>20 (3.4)</td>
<td>360 (62.0)</td>
<td>81 (13.9)</td>
</tr>
<tr>
<td>Respondent believes that PC kills even if diagnosed early or treated</td>
<td>21 (3.6)</td>
<td>154 (26.5)</td>
<td>18 (3.1)</td>
<td>293 (50.4)</td>
<td>95 (16.4)</td>
</tr>
<tr>
<td>Respondent believes that regular checking for PC indicates that one has prostate cancer</td>
<td>127 (21.9)</td>
<td>327 (56.3)</td>
<td>14 (2.4)</td>
<td>96 (16.5)</td>
<td>17 (2.9)</td>
</tr>
<tr>
<td><strong>Mean % scores</strong></td>
<td><strong>9.4</strong></td>
<td><strong>35.6</strong></td>
<td><strong>3.2</strong></td>
<td><strong>40.9</strong></td>
<td><strong>10.9</strong></td>
</tr>
</tbody>
</table>
Overall perception of self-vulnerability to prostate cancer*

<table>
<thead>
<tr>
<th>Perception</th>
<th>Count (Proportion)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good perception</td>
<td>337 (58.0)</td>
</tr>
<tr>
<td>Poor perception</td>
<td>244 (42.0)</td>
</tr>
</tbody>
</table>

Data presented are number of subjects (n) and proportions (%) of individuals. PC, prostate cancer. *the overall perception was calculated using the Likert scores.
4.5 Association between knowledge, socio-demographic characteristics and perception of self-vulnerability to prostate cancer

The association between knowledge levels, socio-demographic variables and perception on self-vulnerability to prostate cancer is summarized in Table 4.4-4.6. Respondents with poor knowledge were older than those with good knowledge on prostate cancer \( (P=0.001) \). The proportion of respondents with good knowledge was higher among catholics (58.1%) compared to protestants (50.7%) \( (P=0.094) \). A majority of the respondents with good knowledge on prostate cancer had university education (76.7%) or diploma (62.2%) education compared to those having secondary (40.9%) and primary (15.0%) education \( (P<0.0001) \). However, no significant associations were observed regarding marital status \( (P=0.498) \) and occupation \( (P=0.415) \) with knowledge levels.

In addition, knowledge levels on prostate cancer were positively correlated with perception of prostate cancer self-vulnerability \( (r=0.144; P=0.001) \). These significant variables were then entered into a binary logistic regression analysis based on the magnitude of the chi-square values (i.e., \( P<0.100 \)) and controlled for age. Respondents reporting Islamic religious affiliation were 3.4 times more likely to have poor knowledge of prostate cancer [OR, 3.371; 95% CI, 0.892-12.736; \( P=0.073 \)]. In contrast, respondents possessing university [OR, 18.741; 95% CI, 6.878-51.064; \( P<0.0001 \)]; diploma [OR, 9.332; 95% CI, 3.752-23.213; \( P<0.0001 \)]; and secondary [OR, 4.078; 95% CI, 1.650-10.075;
$P=0.002$] education were 18.7, 9.3, 3.8, and 4.1 times more likely to have good knowledge on prostate cancer, respectively.

The proportion of respondents with good perception on self-vulnerability to prostate cancer was significantly higher among those with university (59.3%) and diploma (67.3%) education relative to those with secondary (52.8%) and primary (38.1%) education ($P=0.001$). No significant associations were observed regarding age ($P=0.550$), religious affiliations ($P=0.714$), marital status ($P=0.221$) and occupation, ($P=0.256$) and perception of self-vulnerability to prostate cancer. Subsequent binary logistic regression analysis (similar to that for knowledge) indicated that respondents having university [OR, 2.405; 95% CI, 1.121-5.162; $P=0.024$]; diploma [OR, 3.394; 95% CI, 1.699-6.780; $P=0.001$]; or secondary [OR, 1.832; 95% CI, 0.932-3.603; $P=0.079$] education were respectively 2.4, 3.4, and 1.8 times more likely to have good perception on self-vulnerability to prostate cancer.
### Table 4.4. Association between knowledge and socio-demographic profiles

<table>
<thead>
<tr>
<th>Variable</th>
<th>Good knowledge, n (%)</th>
<th>Poor knowledge, n (%)</th>
<th>df</th>
<th>( \chi^2 )</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Median (range)</td>
<td>37.0 (33.0-44.0)</td>
<td>39.0 (35.5-46.0)</td>
<td>-</td>
<td></td>
<td>0.001(^a)</td>
</tr>
<tr>
<td>Religious affiliation*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Catholic</td>
<td>115 (58.1)</td>
<td>83 (41.9)</td>
<td>1</td>
<td>2.804</td>
<td>0.094(^b)</td>
</tr>
<tr>
<td>Protestant</td>
<td>183 (50.7)</td>
<td>178 (49.3)</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marital status*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>245 (56.1)</td>
<td>230 (43.9)</td>
<td>1</td>
<td>0.459</td>
<td>0.498(^b)</td>
</tr>
<tr>
<td>Single</td>
<td>51 (55.4)</td>
<td>41 (44.6)</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education level*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>University</td>
<td>66 (76.7)</td>
<td>20 (23.3)</td>
<td>3</td>
<td>63.748</td>
<td>&lt;0.0001(^b)</td>
</tr>
<tr>
<td>Diploma</td>
<td>135 (62.2)</td>
<td>82 (37.8)</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secondary</td>
<td>97 (40.9)</td>
<td>140 (59.1)</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary</td>
<td>6 (15.0)</td>
<td>34 (85.0)</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Formal employment</td>
<td>186 (52.8)</td>
<td>166 (47.2)</td>
<td>2</td>
<td>1.411</td>
<td>0.415(^b)</td>
</tr>
<tr>
<td>Business</td>
<td>103 (53.4)</td>
<td>90 (46.6)</td>
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<td></td>
</tr>
<tr>
<td>Unemployed</td>
<td>15 (41.7)</td>
<td>21 (58.3)</td>
<td>2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Data shown are number (n) of subjects and proportions (%) unless otherwise indicated. *cells with <5 counts were excluded from the analysis. df, degrees of freedom. \(^a\)Mann-Whitney test. \(^b\)\( \chi^2 \), Pearson's Chi-square. Values in bold are significant P-values.
Table 4.5. Association between perception on self-vulnerability to prostate cancer and socio-demographic profiles

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Good perception, n (%)</th>
<th>Poor perception, n (%)</th>
<th>df</th>
<th>$\chi^2$</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age (years)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Median (range)</td>
<td>38.0 (30.0-70.0)</td>
<td>38.0 (30.0-73.0)</td>
<td>-</td>
<td>-</td>
<td>0.550(^a)</td>
</tr>
<tr>
<td><strong>Religious affiliation(^*)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protestant</td>
<td>208 (62.5)</td>
<td>153 (64.3)</td>
<td>2</td>
<td>0.673</td>
<td>0.714(^b)</td>
</tr>
<tr>
<td>Catholic</td>
<td>119 (35.7)</td>
<td>79 (33.2)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Islam</td>
<td>6 (1.8)</td>
<td>6 (2.5)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Marital status(^*)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>272 (82.2)</td>
<td>203 (86.0)</td>
<td>1</td>
<td>1.496</td>
<td>0.221(^b)</td>
</tr>
<tr>
<td>Single</td>
<td>59 (17.8)</td>
<td>33 (14.0)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Education level(^*)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>University</td>
<td>51 (59.3)</td>
<td>35 (40.7)</td>
<td>3</td>
<td>17.216</td>
<td>0.001(^b)</td>
</tr>
<tr>
<td>Diploma</td>
<td>146 (67.3)</td>
<td>71 (32.7)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secondary</td>
<td>124 (52.8)</td>
<td>111 (47.2)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary</td>
<td>16 (38.1)</td>
<td>26 (61.9)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Occupation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Formal employment</td>
<td>209 (59.4)</td>
<td>143 (40.6)</td>
<td>2</td>
<td>2.724</td>
<td>0.256(^b)</td>
</tr>
<tr>
<td>Business</td>
<td>104 (53.9)</td>
<td>89 (46.1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unemployed</td>
<td>24 (66.7)</td>
<td>12 (33.3)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Data shown are number (n) of subjects and proportions (%) unless otherwise indicated. \(^*\)cells with <5 counts were excluded from the analysis. df, degrees of freedom. \(^a\)Mann-Whitney test. \(^b\)\(\chi^2\), Pearson's Chi square. Values in bold are significant P-values.
Table 4.6. Logistic regression analysis of knowledge levels and perception of self-vulnerability to prostate cancer with socio-demographic characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>B</th>
<th>Wald</th>
<th>OR (95% CI)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Poor knowledge</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protestant</td>
<td>Reference</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Catholic</td>
<td>-0.292</td>
<td>2.642</td>
<td>0.747 (0.525-1.062)</td>
<td>0.104</td>
</tr>
<tr>
<td>Islam</td>
<td>1.215</td>
<td>3.210</td>
<td>3.371 (0.892-12.736)</td>
<td>0.073</td>
</tr>
<tr>
<td><strong>Good knowledge</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary education</td>
<td>Reference</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secondary education</td>
<td>1.405</td>
<td>9.274</td>
<td>4.078 (1.650-10.075)</td>
<td><strong>0.002</strong></td>
</tr>
<tr>
<td>Diploma education</td>
<td>2.233</td>
<td>23.075</td>
<td>9.332 (3.752-23.213)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>University education</td>
<td>2.931</td>
<td>32.837</td>
<td>18.741 (6.878-51.064)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td><strong>Good perception</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary education</td>
<td>Reference</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secondary education</td>
<td>0.606</td>
<td>3.082</td>
<td>1.832 (0.932-3.603)</td>
<td>0.079</td>
</tr>
<tr>
<td>Diploma education</td>
<td>1.222</td>
<td>11.987</td>
<td>3.394 (1.699-6.780)</td>
<td><strong>0.001</strong></td>
</tr>
<tr>
<td>University education</td>
<td>0.878</td>
<td>5.073</td>
<td>2.405 (1.121-5.162)</td>
<td><strong>0.024</strong></td>
</tr>
</tbody>
</table>

Data shown are OR, odds ratio with 95% CI, confidence intervals. B, set of estimated coefficients in the model. Values in bold are significant P-values. Since protestant religion was the most frequent in respondents with good (62.5%) and poor (64.3%) knowledge, it was selected as the reference category.
4.6. Uptake, awareness and knowledge of prostate cancer screening

Of the 581 respondents, a majority had never been screened for prostate cancer [557 (95.9%)] and only 24 (4.1%) had ever taken up prostate cancer screening (Figure 4.9). Overall, 280 (48.2%) of the respondents were aware of prostate cancer screening (Figure 4.10), and only 41 (7.1%) of the respondents knew about prostate cancer screening methods (Figure 4.11). Of these 41 respondents, 68.3%, 61.0% and 24.4%, respectively reported knowing prostate specific antigen (PSA), direct rectal examination (DRE) and biopsy methods, respectively (Figure 4.12).

Figure 4.9. Uptake of prostate cancer screening
Figure 4.10. Awareness levels on prostate cancer screening

Figure 4.11. Knowledge levels on prostate cancer screening methods

Figure 4.12. Knowledge levels of specific prostate cancer screening methods
Two hundred and eighty (48.2%) of the total respondents had heard about prostate cancer screening and 266 (45.8%) knew about the frequency of prostate cancer screening (Table 4.7). Most of the respondents reported getting information on prostate cancer screening from the mass media [169 (29.1%)] (Figure 4.13). Other sources of information on prostate cancer screening included multiple sources (i.e., mass media, acquaintances and health practitioners) [72 (12.4%)], acquaintances [23 (4.0%)], and health practitioners [19 (3.3%)]. However, [298 (51.3%)] of the respondents could not remember the sources of information on prostate cancer screening (Figure 4.13). Importantly, 531 (91.4%) of the respondents were willing to take up screening for the disease. In addition, 565 (97.2%) of the respondents were willing to know more about prostate cancer screening (Table 4.7).

Figure 4.13. Sources of information on prostate cancer screening
Table 4.7. Knowledge and willingness for uptake of prostate cancer screening

<table>
<thead>
<tr>
<th>Variable</th>
<th>No.</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knows about frequency of prostate cancer screening</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yearly</td>
<td>266</td>
<td>45.8</td>
</tr>
<tr>
<td>Every 2 years</td>
<td>43</td>
<td>7.4</td>
</tr>
<tr>
<td>Every 3 years</td>
<td>9</td>
<td>1.5</td>
</tr>
<tr>
<td>I don’t know</td>
<td>263</td>
<td>45.3</td>
</tr>
<tr>
<td>Willing to take up prostate cancer screening today</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>531</td>
<td>91.4</td>
</tr>
<tr>
<td>No</td>
<td>39</td>
<td>6.7</td>
</tr>
<tr>
<td>I don’t know</td>
<td>11</td>
<td>1.9</td>
</tr>
<tr>
<td>Willing to know more about prostate cancer screening</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>565</td>
<td>97.2</td>
</tr>
<tr>
<td>No</td>
<td>16</td>
<td>2.8</td>
</tr>
</tbody>
</table>

Data shown are number (n) of subjects and proportions (%).
4.7. Associations of the uptake of prostate cancer screening with socio-demographic profiles, knowledge and perception of self-vulnerability towards prostate cancer

In order to examine whether there were associations between uptake of prostate cancer screening and socio-demographic variables, knowledge and perception of self-vulnerability towards prostate cancer, the distribution of these variables was compared between respondents reporting having ever been tested (n=24) or never been tested (n=557) for prostate cancer (Table 4.8). Age distribution between these groups was statistically similar ($P=0.447$). Chi-square analysis could not be performed on religious affiliations, education levels, marital status and occupation distribution due to less than five counts in some cells. In addition, proportions of respondents with good knowledge on prostate cancer (66.7% vs. 51.7% ; $P=0.151$) and good perception about self-vulnerability (79.2% vs. 57.1% ; $P=0.032$) were also higher among those reporting ever being tested for prostate against those who had never been tested.
Table 4.8. Associations of the uptake of prostate cancer screening with socio-demographic characteristics, levels of knowledge and perception of self-vulnerability towards prostate cancer

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Ever been tested for prostate cancer</th>
<th>Never been tested for prostate cancer</th>
<th>df</th>
<th>$\chi^2$</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td></td>
<td></td>
<td>-</td>
<td>-</td>
<td>0.447</td>
</tr>
<tr>
<td>Median (range)</td>
<td>40.0 (30.0-60.0)</td>
<td>38.0 (30.0-73.0)</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Religious affiliation</td>
<td></td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Protestant</td>
<td>13 (3.6)</td>
<td>348 (96.4)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Catholic</td>
<td>11 (5.6)</td>
<td>187 (94.4)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Islam</td>
<td>0 (0.0)</td>
<td>12 (100.0)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Married</td>
<td>19 (4.0)</td>
<td>456 (96.0)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Single</td>
<td>3 (3.3)</td>
<td>89 (96.7)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Education level</td>
<td></td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>University</td>
<td>3 (3.5)</td>
<td>83 (96.5)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Diploma</td>
<td>15 (6.9)</td>
<td>202 (93.1)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Secondary</td>
<td>4 (1.7)</td>
<td>231 (98.3)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Primary</td>
<td>2 (4.8)</td>
<td>40 (95.2)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Formal employment</td>
<td>18 (5.1)</td>
<td>334 (94.9)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Business</td>
<td>6 (3.1)</td>
<td>187 (96.9)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Unemployed</td>
<td>0 (0.0)</td>
<td>36 (100.0)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Knowledge</td>
<td></td>
<td></td>
<td>1</td>
<td>2.065</td>
<td>0.151</td>
</tr>
<tr>
<td>Good</td>
<td>16 (66.7)</td>
<td>288 (51.7)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>8 (33.3)</td>
<td>269 (38.3)</td>
<td></td>
<td>2.065</td>
<td>0.151</td>
</tr>
<tr>
<td>Perception</td>
<td></td>
<td></td>
<td>1</td>
<td>4.603</td>
<td>0.032</td>
</tr>
<tr>
<td>Good</td>
<td>19 (79.2)</td>
<td>318 (57.1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>5 (20.8)</td>
<td>239 (42.9)</td>
<td></td>
<td>4.603</td>
<td>0.032</td>
</tr>
</tbody>
</table>

Data shown are number (n) of subjects and proportions (%) unless otherwise indicated. df, degrees of freedom. $\chi^2$, Pearson's Chi square.
CHAPTER FIVE: DISCUSSION

5.1 Introduction

Little is known about the risk factors of prostate cancer among men in Sub-Saharan Africa despite the fact that this population around the world suffer higher levels of prostate cancer than other ethnicities (Rebeck et al., 2013). Prostate cancer is the leading cancer affecting men in Africa, with an estimated incidence of 40,000 cases and 28,000 deaths in 2008 according to WHO data (Ferlay et al., 2011). In Kenya, there is an increase in the burden of prostate cancer with an approximate incidence of 1,087 cases and 889 deaths reported in 2008 (Ferlay et al., 2011). However, the underlying factors that govern this increasing burden of prostate cancer are largely undefined among Kenyan men. Therefore, the current study investigated the awareness and knowledge, perceptions on self-vulnerability towards prostate cancer and uptake of prostate cancer screening among men in Nairobi County, Kenya.

5.2 Awareness levels on prostate cancer

Findings from this study indicated high awareness among the respondents on prostate cancer. However, less than half of the respondents were aware that prostate cancer was a prevalent disease in men while at least three quarters of the respondents reported awareness of the serious effects of the disease. Respondents also reported multiple sources of prostate cancer information with the mass media being the leading source of the information. These findings
are similar to previous studies among Nigerian men (age ≥50 age ≤ 100 years) showing awareness levels on prostate cancer of 80% and the mass media as the main source of prostate cancer information (Oladimeji et al., 2010). These results are important in view of the fact that prostate cancer is an increasing health burden among men in Kenya. The findings presented here showing that only ~41% of the respondents were aware that prostate cancer was prevalent in men and the reported multiple sources of information on the disease suggest a requisite for improving the quality of the prostate cancer information through delivery of tailored promotive messages via multiple delivery channels including the mass media to capture a wider target audience.

5.3 Knowledge on prostate cancer

The overall knowledge levels established in this study are similar to those of (Arnold-Reed et al., 2008; Oladimeji et al., 2010) that showed low levels of knowledge on prostate cancer among Nigerian and Australian men, respectively. The findings are however dissimilar to those of (Magnus, 2004) showing higher knowledge levels on prostate cancer at 63% among African immigrant men living in the USA. This is not surprising since most immigrants had at least high school education (Magnus, 2004).

Overall, only ~53% of the respondents in this study had good knowledge levels on prostate cancer and most of the respondents (64%) were knowledgeable about the age at risk for prostate cancer. Consistent with the low knowledge
levels, specific knowledge levels on signs and symptoms, treatment and prevention modes for prostate cancer were low. While approximately 89% of the respondents knew that difficulty in urinating was an important sign of prostate cancer, only less than 20% of them knew of the other signs and symptoms of prostate cancer. The differences in knowledge levels were also reported for treatment options for prostate cancer. Even though chemotherapy and radiotherapy were reported by more than 66% of the respondents as the common treatment method for prostate cancer, less than half of them knew that surgery was an integral procedure of prostate cancer treatment. These differences may be explained in part by the different ethnic and educational backgrounds of the study participants as previously noted among prostate cancer patients in the Western Cape of South Africa (Heyns, Fisher, Lecuona, & van der Merwe, 2011). These findings support a need for concerted efforts aimed at raising knowledge levels on the disease in the population focusing on the aetiology, signs and symptoms, prevention and treatment modalities. Ultimately, raising such information will lead to increased knowledge levels with increase in early detection and treatment that will reduce morbidity and mortality.

Although regular screening is being advocated as an important preventive intervention in Kenya (MPHS & MMS, 2011), only 55% of the respondents knew about its preventive value. Consistent with the low knowledge on prevention methods, only 54% knew that diet was an important prevention
method for prostate cancer. Of greater potential for advocacy were results showing that less than 10% of the respondents knew about hygiene preventive methods such as genital hygiene, avoidance of multiple sexual partners and condom use that can be integrated into the STI and well man clinics. The screening prevalence observed in the current thesis research of four percent is consisted with a figure of less than 30% among Saudi Arabian, Jordanian and Egyptian men that was attributed to poor knowledge (Arafa et al., 2012). Proper information, the Arab study concluded, should be provided to men including their families, to improve attitudes and behaviors towards prostate cancer screening practices.

Results showing that respondents with poor knowledge were older than those with good knowledge on prostate cancer are consistent with previous studies among low income minority (Latino) men showing that increasing age was associated with lower knowledge of prostate cancer (Deibert et al., 2007). While the reasons for these associations are not clear, it is possible that in the current technological age, younger men are more likely to be educated and more informed about health matters regarding the disease than older men. This is further supported by studies by (Ford, Vernon, Havstad, Thomas, & Davis, 2006), showing intergenerational differences in health information on prostate cancer. It is important to emphasize that most of the respondents that had good knowledge on prostate cancer had university, diploma or secondary level
education. The results of this study therefore suggest that education is an important determinant of prostate cancer knowledge.

Religion also appears to influence knowledge levels on prostate cancer. This is not surprising since Islam (that had poor knowledge on prostate cancer) advocates for conservative practises regarding sexuality (Maulana, Krumeich, & Van Den Borne, 2009) that is connected with prostate cancer. Furthermore, religious beliefs and behaviors are predictive of behavioral intention for clinical examination of prostate cancer (via direct rectal examination) (Holt, Wynn, & Darrington, 2009). Thus, the influence of religion in prostate cancer beliefs and screening should be considered while formulating educational interventions for men. This premise justifies the targeted incorporation of cancer information and prevention promotion on prostate cancer into the school system.

5.4 Perception on self-vulnerability towards prostate cancer

Overall, only 58% of the respondents had good perception on self-vulnerability towards prostate cancer risk. These findings differ from previous studies among Nigerian men showing that only 19.4% of the men perceived themselves at risk of developing prostate cancer (Oladimeji et al., 2010). Importantly, perception levels were correlated positively with knowledge levels, and university, diploma or secondary education. Similar studies showed that US Nigerian immigrants men had better prostate cancer personal
cognitive-behavioral factors such (i.e., perceived susceptibility to prostate cancer, attitude towards prostate cancer screening and prostate cancer knowledge) relative to indigenous Nigerian men (Oghenetejiri, 2009). Similarly, (Abernethy, Houston, Bjorck, Gorsuch, & Arnold, 2009; Blocker et al., 2006) found that self-directed problem solving were associated with prostate cancer screening attitudes. Taken together, these results suggest that it is important that men understand the medical and psycho-social issues influencing prostate cancer in order to make informed decisions regarding prostate cancer screening and prevention. Thus, empowering men with knowledge, particularly through the school system, can lead to behavioural, perceptional and attitudinal change leading to prevention of the disease.

5.5 Uptake of screening
The uptake of prostate cancer screening reported by respondents enrolled in this study was only 4.1%. This figure mirrors a level of 4.5% previously reported for Nigerian men (Oladimeji et al., 2010). The same research (Oladimeji et al., 2010) showed that 22.5% of the Nigerian men were aware of prostate cancer screening. This finding differs from the results reported in the current work showing awareness levels of 48.2% on prostate cancer screening. Of great significance are findings presented here showing that uptake of prostate cancer screening was associated with good knowledge and perception on self-vulnerability to prostate cancer. These findings are similar to the
(Oladimeji et al., 2010) studies among Nigerian men which showed higher perception and knowledge levels of prostate cancer screening.

Consistent with the low awareness and screening levels, low knowledge levels were reported among the respondents on prostate cancer screening methods and frequency of screening. These findings differ from observations by (Ajape et al., 2009) showing that only 5.8% of the Nigerian urban men were aware of the PSA test. The dissimilarities in the findings may be accounted for by the differences in the educational and religious backgrounds given that most of the respondents in the Nigerian study were Muslims with less than secondary level education. In addition, the Nigerian study only examined the PSA method of screening while respondents in the current study reported knowing the three test procedures (PSA, DRE and biopsy). However, the findings in this thesis differ from a recent study in Ghana showing 69.9% PC prevalence out of which 33.8% had metastatic disease (Yamoah et al., 2013). Thus, highlighting a need for earlier detection for effective treatment.

Of great significance are the findings showing that 91.4% of the respondents were willing to take-up prostate cancer screening and 97.2% of the respondents were willing to learn more about prostate cancer screening. The higher willingness levels to screen for the disease in the Nairobi County men may be attributed to the increasing awareness of the disease especially amongst the educated population. These results are similar to previous studies by
(Oladimeji et al., 2010) showing that 81.5% of the Nigerian men were willing to routinely screen for prostate cancer. Moreover, studies by (Ajape, Ibrahim, Fakeye, & Abiola, 2010) also showed that 84% of the urban Nigerian men were ready to pay for prostate cancer screening test. Taken together these studies and findings of this current thesis suggest that there is a high level of willingness for knowledge and screening for prostate cancer among men. It will be important however, to identify the factors responsible for the low uptake of screening. Thus, good knowledge of prostate cancer is a strong factor for enhancing uptake of screening for the disease, which could be achieved through formal and informal education and reinforced through focused health education activations.
CHAPTER SIX: CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

i) Awareness levels on prostate cancer are high among men in Nairobi County. Overall, only about a half of the respondents had good knowledge levels on prostate cancer with less than a half of them knowing the signs and symptoms, treatment and preventive measures for prostate cancer.

ii) Knowledge levels on prostate cancer are influenced by educational levels among men in Nairobi County.

iii) Perception levels on self-vulnerability to prostate cancer are low among men in Nairobi County and are influenced by religious affiliation, knowledge and educational levels.

iv) The uptake of prostate cancer screening is very low among men in Nairobi County; however most of the men are willing to undertake prostate cancer screening and know more about the disease.

v) There is a close association between education levels, good knowledge on PC, and good perception on self-vulnerability to PC.
6.2 Recommendations

i) The Ministry of Health at national and county levels, and cancer stakeholders to promote information on the signs and symptoms, treatment and preventive measures of prostate cancer that will enhance further awareness and knowledge of the disease.

ii) The Ministry of Health at national and county levels, and cancer stakeholders to promote good knowledge on prostate cancer to increase men’s perception of self-vulnerability towards the disease and hence increase PC screening uptake amongst men at risk in the Nairobi County.

iii) The Ministry of Health at national and county levels should expand screening services at health facilities and public health promotion will enhance uptake of prostate cancer screening leading to ameliorating the burden of the disease in Kenya.
6.3 Areas of further research

i) There is need for sustained local research regarding risk factors (e.g., family history, genetics, etc) for prostate cancer that may improve further understanding of prostate cancer and the uptake of prostate cancer screening in Kenya.

ii) Investigations focusing on behavioural and lifestyles may provide insights into the impact of behaviour and lifestyle on development of prostate cancer leading to targeted interventions.

iii) Research into the factors that influence uptake of screening e.g., stigma on DRE and scaling up availability of screening services will provide information necessary for planning and improving uptake of prostate cancer screening among men in Kenya.

iv) Expand prostate cancer research to other Kenyan regions especially at county level to identify the unique factors influencing awareness, knowledge, perceptions and uptake of screening to formulate relevant and specific targeted interventions for the disease.
REFERENCES


Ogenetijeji, U. E. (2009). Factors influencing Men’s decision to undergo prostate specific antigen testing at the University of Benin Teaching Hospital, Nigeria: Qualitative study. *Arch Ibadan Med, 1*(12), 3-5.


APPENDICES

Appendix A: Questionnaire instrument (English)

Date…………………………..
Resident of which Constituency of Nairobi ……………………………..

A) Respondents Socio-Economic and Demographic Characteristics
1) What is your age………………….. years
2) What is your religion? Catholic [ ] Protestant [ ] Muslim [ ] Traditional [ ] Non/Atheist [ ]
3) Do you reside in Nairobi Yes [ ] No [ ]
   If not, which is your usual residence……………………..
5) Marital Status Married [ ] Single [ ] Widowed [ ] Separated [ ] Divorced [ ]
6) Current Occupation ………………………………..
7) In what bracket does your monthly earnings (employed or self employed) fall
   less than10,000 [ ] 10-20,000 [ ] 21-35,000 [ ] 36-50,000[ ] 51-80,000 [ ]
   81-100,000[ ] more than100,000 [ ]
8) i) Have you ever worked in a farm that uses fertilizers and other chemicals Yes [ ] No [ ], if yes, how long ……..yrs
   ii) Have you ever worked in a chemical related factory or chemical warehouse: Yes [ ] No [ ], if yes how long……yrs
   iii) Have you ever worked in the X-ray dept of a hospital or a Lab Yes [ ] No [ ], If yes, how long ……..yrs
9) Level of Education None [ ] Primary [ ] Secondary [ ] Diploma [ ] University[ ]
10) General Health Status
   a) How would you rate your general state of your health today
       Excellent [ ] Good [ ] Fair [ ] Poor [ ]
   b) Do You smoke? Yes [ ] No [ ]
   c) Do you Drink alcohol Yes [ ] No [ ]
   d) How would you rate your daily consumption of vegetables and fruits:
       high [ ] medium [ ] low [ ] poor [ ] Non [ ]
   e) When last did you see a doctor/ nurse/ a pharmacist
       Last week[ ] last month [ ] 2 months ago [ ] last year [ ]
   f) When did you last have a thorough medical examination of your body
       Never[ ] last Month[ ] 3 months ago[ ] 6 months ago[ ] 1 year ago [ ]
       2 years ago [ ]
   g) It is important to get tested to prevent disease?
       I Strongly agree [ ] I agree [ ] I disagree [ ] I strongly disagree [ ]
   h) What are some specific health screenings that you’ve participated in
       ………………………….., ……………………..,
   …………………………..
   When do you see a doctor ?
Only when I am sick [ ] once every 6 months whether sick or not [ ] once a year whether sick or not [ ]

j) Do you currently suffer from any urinary tract pains/discomforts
Yes[ ] No [ ]

B) Family History of Cancer
a) Does anyone in your Family have cancer?........... What type of cancer…….
What is their relation to you............... 
b) Has anyone in your Family died of Cancer........ What type of Cancer........
What is the relation to you..................
c) Has any friend of yours died from Cancer?
Yes [ ] No [ ]. What type of Cancer was it?..................

C) Respondent’s Knowledge of Prostate Cancer
a) Have you heard of Prostate Cancer? Yes [ ] No [ ] 
b) Do you believe that prostate cancer is a common disease? Yes [ ] No [ ] 
c) Do you believe that prostate cancer is a serious disease? Yes [ ] No [ ] 
d) Do you know anyone who is suffering from Prostate Cancer today?
Yes[ ] No[ ] 
e) Do you know anyone who has died from Prostate Cancer Yes [ ] No [ ]
f) Have you heard/ do you know of Prostate Cancer screening Yes [ ] No [ ]
g) Have you ever been tested/ screened for prostate cancer? Yes [ ] No [ ] 
h) Where did you know/hear from about Prostate Cancer?
A Friend [ ] Read about it [ ] TV [ ] Radio [ ] Doctor [ ] Nurse [ ] Relative [ ] 

i) i) Do you know the symptoms of prostate cancer? Yes[ ] No [ ]
    ii) If yes, what are the symptoms?
        Difficult or frequent urination [ ] blood in urine [ ] bone pain [ ]
        painful sex [ ] Loss of sex drive [ ] infertility [ ]
   j) In your knowledge who gets Prostate Cancer ?
      Men below 40 years [ ] 40-50 [ ] 50-60 [ ] 60-70 [ ] above 70 [ ]
      I do not know [ ]
k) i) Do you think prostate cancer is preventable? Yes [ ] No [ ]
      I do not know[ ]
      ii) If yes, how can it prevented ?
          Genital hygiene [ ] regular screening [ ] use of condoms [ ]
          Use of right Diet [ ] Avoiding many sexual partners [ ] others...........
l) i) Is prostate cancer curable? Yes [ ] No [ ]
      ii) If yes, at what stage is it curable?
          Early stage [ ] any time treatment is commenced [ ] late stage [ ] I do not
          Know [ ]
m) i) Do you know of any method used in treating prostate cancer?
      Yes [ ] No [ ]
      ii) If yes, which methods of treatment do you know?
          Radiotherapy [ ] Surgery [ ] Chemotherapy/drugs [ ]
          Radiotherapy and Surge[] Surgery, Drugs and Radiotherapy [ ]
n) Where can these methods of treatment be offered?
  Govt health centres [ ] Govt district hospitals [ ] Govt provincial hospitals [ ]
  Kenyatta National Hospital [ ] Private hospitals [ ] rural home (local
  medicine man) [ ] Herbal vendors [ ] others, specify………………
o) i) Do you think the treatment method/s are safe and effective?
    Yes [ ] No [ ] I do not know [ ]
   ii) if yes, where did you get this information from?
       Daily papers/magazines [ ] health care centre/hospital [ ] friends [ ]
       radio/TV [ ] Relatives [ ] others specify……………..
p) Is it possible for a healthy-looking person to have prostate cancer?
    Yes [ ] No [ ]
q) Do think that you are at risk of developing Prostate cancer? Yes [ ] No [ ]
r) Are you afraid that you may develop Prostate Cancer?
   Extremely [ ] Very [ ] No [ ] Could not be bothered [ ]
   It is the will of God [ ]
s) What is your level of interest in wanting to know more about Prostate
   Cancer?
   Extremely high [ ] Very high [ ] Non [ ] Could not be bothered [ ]
t) i) Is there a local name for prostate cancer in your dialect? Yes [ ] No [ ].
   ii) If it is there, what is it?……………………………………

D) Respondent’s knowledge on Prostate screening testing
a) i) Have you heard of prostate cancer screening? Yes [ ] No [ ]
   ii) If yes, where did you hear it from?
       Hospital [ ] Doctor [ ] Pharmacy [ ] friend [ ] relative [ ] radio [ ] TV [ ]
       newspapers/books/magazines [ ] other specify……………..
b) i) Do you believe that you are at a higher risk of getting prostate cancer than
   other men: Strongly agree [ ] Agree [ ] Disagree [ ] Strongly disagree [ ]
   ii) It is likely that I will get prostate cancer in future
       Strongly agree [ ] Agree [ ] Disagree [ ] Strongly disagree [ ]
c) If you have been screened for prostate cancer, which method was used
   Prostate specific antigen (PSA) [ ] Direct rectal examination (DRE) [ ]
   Biopsy [ ] I do not know [ ]
d) i) Do you know anyone who has taken a Prostate Cancer Screening test ?
    Yes [ ] No [ ]
   ii) If Yes, who are they to you? Family member[ ] Relative[ ] Friend[ ]
e) I believe that there is nothing I can do to prevent me from getting prostate
   cancer: Strongly agree [ ] Agree [ ] Disagree [ ] Strongly disagree [ ]
f) What I eat will determine if I get prostate cancer or not
   Strongly agree [ ] Agree [ ] Disagree [ ] Strongly disagree [ ]
h) i) Would you like to know more about Prostate Cancer-screening?
    Yes [ ] No [ ]
   ii) If No, is it because?
       I am afraid [ ]
I do not need to know more about it [ ] God protects his own [ ]
I do not know whether I take it or not [ ] I do not want to know [ ]
I do not know where to get the information [ ]
i) Doing prostate cancer screening/test is embarrassing for me
   Strongly agree [ ] Agree [ ] Disagree [ ] Strongly disagree [ ]
j) From what you know, how often should one go for prostate cancer screening?
   Yearly [ ] every two years [ ] every three years [ ] do not know [ ]
k) What do you think gets in the way of people getting screened/tested for prostate cancer
   Lack of knowledge [ ] Fear of the unknown [ ]
   Deliberately not wanting to know [ ] God protects, why bother [ ]
l) i) Do you know of specific prostate cancer screening tests by name?
   Yes [ ] No [ ]
   ii) If yes have you heard of the following screening methods?
      Prostate screening antigen (PSA) assay testing Yes [ ] No [ ]
      Digital rectal examination (DRE) Yes [ ] No [ ]
      Engrailed-2 (EN2) Yes [ ] No [ ] Other Specify ........................
   iii) Where did you hear any or all of the tests from?
      Hospital [ ], Doctor [ ], Pharmacy [ ], friend [ ], relative [ ], radio [ ],
      TV [ ], newspapers/books/magazines [ ], Cannot remember [ ]
n) A man can have prostate cancer without having any pain or symptoms
   True [ ] False [ ] I do not know [ ]
o) If I developed prostate cancer, I would not live more than 5 years
   Strongly agree [ ] Agree [ ] Disagree [ ] Strongly disagree [ ]
p) If someone has prostate cancer, I think it is already too late to get treated for it:
   Strongly agree [ ] Agree [ ] Disagree [ ] Strongly disagree [ ]
q) Prostate cancer will kill you no matter when it is found and how it is treated
   Strongly agree [ ] Agree [ ] Disagree [ ] Strongly disagree [ ]
r) I think getting checked for prostate cancer makes people scared that they may really have prostate cancer
   Strongly agree [ ] Agree [ ] Disagree [ ] Strongly disagree [ ]
s) I think some people do not want to know if they have prostate cancer because they do not want to know they may be dying from it
   Strongly agree [ ] Agree [ ] Disagree [ ] Strongly disagree [ ]
t) I choose a diet low in fat and cholesterol
   Never [ ] Sometimes [ ] Often [ ] Routinely [ ]
u) I endeavour to have vegetables in my diet on a daily basis
   Never [ ] Sometimes [ ] Often [ ] Routinely [ ]
v) I follow a planned exercise program
   Never [ ] Sometimes [ ] Often [ ] Routinely [ ]
w) I discuss my health concerns with health professionals
   Never [ ] Sometimes [ ] Often [ ] Routinely [ ]
x) I seek to read up and watch out for materials about improving my health
   Never [ ] Sometimes [ ] Often [ ] Routinely [ ]
Appendix B: Questionnaire instrument and Consent Form (Kwa Kiswahili)

Orodha Ya Mwaswali yalioulizwa kwenye Uchunguzi huu
Tarehe…………………………..
Mahala anapoishi Anayejibu maswali (Kaunti ya Nairobi) …………………

A) Daraja, hali ya maisha, na kipimo ya kifedha ya Anayejibu maswali
1) Umri wako………………………… miaka
2) Dini yako?
   Mkatholiki [ ] Muprotestanti [ ] Muisilimu [ ] Dini ya Kenyeji [ ]
   Asie amini chochote [ ]
3) Unaishi Nairobi ?  Ndiyo [ ] la [ ]
   Kama ndivyo, kwa munda gani, ………miaka
4) Hali Yako ya Ndoa
   Nina Mke [ ] Sijaoa [ ] Nimefiwa [ ] Hatushi pamoja [ ]
   Nipo’Telakani [ ]
5) Unajimudu viki vya kimaisha………………………………………
6) Unajimudu viki vya kimaisha………………………………………
7) Marupurupu yako ya kila mwezi ipo wapi kati ya hizi
   chini ya10,000 [ ] 10-20,000 [ ] 21-35,000 [ ] 36-50,000[ ] 51-80,000 [ ]
   81-100,000[ ] zaidi ya100,000 [ ]
8) i) Ushawahi kufanya kazi kwa mashaba ambayo yalitumia mbolea za
   kutengezwa ndio [ ] la [ ]
   Kama ndivyo, kwa munda gani, ………miaka
   ii) Ushafanya kazi kwa viwanda vya kemikali
   ndio [ ] la [ ] kama ndivyo, kwa munda gani ………miaka
   iii) Ushawahi kufanya kazi kwenye afisi za nuru ya umeme hospitalini au
   ambapo magongwa ya mwili yana pimwa na watalamu kutumia machine
   ndio [ ] la [ ]
   Kama ndivyo, kwa munda gani ………miaka
9) Kiwango chako cha elimu kina lenga wapi
   None [ ] msingi [ ] sekondari [ ] Diploma [ ] chuo kiku [ ]
10) Hali Yako ya Kimwili
   Je waweza kusema hali yako ya mwili ya lenga wapi kwa sasa
   bora [ ] Nzuri [ ] sawa tu [ ] hohe hahe [ ]
   b) Wa vuta sigara ? ndio [ ] la [ ]
   c) wa tumia mvinyo ?   ndio [ ] la [ ]
   d) Kipimo chako cha utumiaja wa matunda na mboga wa lenga wapi:
   juu sana [ ] kati kati [ ] kiasi ya chini [ ] hohe hahe [ ] sikuli hata [ ]
   e) Ni lini mwishe ulimuona daktari, mlezi au mwana-famacia
   wiki jana [ ] mwezi jana [ ] miezi miwili ilio pita [ ] mwaka jana [ ]
   f) Ni lini mwishe mwili wako ulikaguliwa na daktari, kiafya
   Sijawahi [ ] mwezi jana [ ] miezi tatu zilizopita [ ] miezi sita ilizo pita [ ]
   mwaka mmoja uliopita [ ] miaka miwili ilio pita [ ]
g) Unakubali vipi kuhusu kupimwa ili kuzuia magojwa?
   Nakubali zaidi [ ] nakubali tu [ ] sikubali [ ] sikubali kabisa [ ]

h) Ni vipimo gani za magonjwa ushawahi kufanyiwa
   ………………………, ………………………,
   Je, ni lini unamuona Daktari?

i) Ambapo nipo mgongojwa [ ] kila ya miezi, kama nipo mgonjwa au la [ ]
   Kila mwaka kama nipo mgongojwa au la [ ]

j) Una maumivu ya sehemu za kutoa mkojo kwa sasa, sehemu ya kibofu
   ndio [ ] la [ ]

B) Historia ya Kifamilia Yako ya kansa
a) Kuna moja kwenye familia yako ambaye ambaye ana uguwa ungonjwa wa saratani?
   ………… Ni ai aina gani ya saratani……. Je uhusiano yake na wewe ni
   mgani …………

b) Familia yako ishawahi kumpoteza mtu ye yote na ungonjwa wa saratani?
   ……… Ilikua ni saratani ina gani……. Je ‘uhusiano ya mtu huyu na we ni
   mgani…………………

c) ushawahi kumpoteza Rafiki yeyote kwa njia ya saratani ndio [ ] la [ ].
   Je lifahamu ilikia ni iana gani ya saratani?.........................

C) Ufahamu, Ujuaji na habari za ungonjwa wa saratani ya Korodani na
   Anayejibu maswali
a) Je uhusawi kuusikia ungonjwa wa saratani ya korodani? ndio [ ] la [ ]

b) Je Unaamini saratani ya korodani ni ungonjwa ambaa umetambaa sana?
   ndio[ ] la [ ]

c) Je unaamini kwamba saratani ya korodani ni ungonjwa hatari? ndio [ ] la [ ]

b) Je kuna mtu umjuae ambaye ana ungonjwa wa saratani ya korodani?
   ndio[ ] la [ ]

d) Je umjua mtu ye yote ambaye alifariki kutokana na saratani ya korodani
   ndio [ ] la [ ]

e) Je uhusawi kumpoteza Rafiki yeyote kwa njia ya saratani ndio [ ] la [ ].
   Je lifahamu ilikia ni iana gani ya saratani?.........................

f) Je uhusawi kusikia uchunguzaji wa ungonjwa wa saratani ya korodani
   ndio [ ] la [ ]

g) Je uhusawi kuchungunzwa kuhusu saratani ya korodani? ndio [ ] la [ ]

h) Je ulipata habari za saratani ya korodani kutoka wapi?
   A marafiki [ ] magazetini [ ] runinga [ ] radio [ ] daktari [ ] mlezi [ ]
   shemeji [ ]

i) i) Je wazijua dalili za saratani ya korodani? Yes[ ] No [ ]

ii) Kama ndivyo, dalili hizi ni kama zipi?
   Uguwu wa kukojoa [ ] damu kwenye mkojo [ ] maumivu mifupani [ ]
   uchungu ngononi [ ]
   Kutorithika na ngononi [ ] ukosefu wa kuzaa [ ]

j) Je kulingana na ufahamu wako, ninani ambaye hushikwa na ungonjwa wa
   saratani ya korodani?
   Wanaume chini ya 40 years[ ] 40-50[ ] 50-60 [ ] 60-70[ ] zaidi ya 70 [ ]
   sijui [ ]

k) i) Je wafikiri ungonjwa wa saratani ya korodani waweza kuzuiwa?
ii) Kama ndivyo, ungonjwa huu waweza kuzuiwa kwa njia gani?
Usafi wa sehemu za siri [ ] ukaguzi wa mara kwa mara [ ]
utumiaji wa mipira ya kondomu [ ]; ulaji wa chakula inavyo
pendekezwa [ ]; kujiinga na watu wengi ngononi [ ];
zinginezo……………………

l)  i) Je saratani ya korodani yaweza kutibiwa?  ndio [ ] la [ ]
ii) Kama ndivyo je ni kifungu gani saratani ya korodani yaweza kutibika?
Kifungu cha mapema [ ] wakati wowote matibabu yanapo anzishwa [ ]
kifungu cha mwisho, mwisho [ ] sijui [ ]
m)  i) Je, unahabari ya taratibu zozote za kutibu saratani ya korodani ?
ndio [ ] la [ ]
ii) Kama ndivyo , ni taratibu gani za kutibu saratani ya korodani ambazo
unazijua?
radiotherapi [ ] upasuaji [ ] kemothepani/madawa [ ] Radiotherapi na
upsauji [ ] upasuaji, madawa and Radiotherapi [ ]
dawa za miti shamba [ ] zinginezo………………..

n) Je hizi taratibu za matibabu zapatikana wapi?
Zahanati ndogo za serikali [ ] hospitali za serikali, tarafani [ ]
hospitali za serikali mikoani [ ]
Hospitali kuu ya Kenyatta [ ] mahospitali ya kibinafsi [ ]
wanganga kule nyumbani [ ] Wauzaji wa miti shamba [ ]
taratibu zinginezo………………..
o)  i) Je wafikiria hizi tibabu zina tibu, na ni salama?
ndio [ ] la [ ] sijui [ ]
ii) kama ndivyo, ulipata wapi habari hizi?
magazetini [ ] zahanati [ ] marafiki [ ] radio/runinga [ ]
wajomba [ ] zinginezo………………..
p) Je huenda mtu ambaye anaonekana na afya nzuri kuwa na saratani ya
korodani?  ndio [ ] la [ ]

q) Je wathania wewe unaweza kushikwa na ungonjwa huu wa saratani ya
korodani ?  ndio [ ] la [ ]
r) Je una hofu ya kwamba, unaweza kupata ungonjwa wa saratani ya korodani?
Nina Hofu tele [ ] nina hofu [ ] sina hofu [ ] la sijali kamwe [ ]
mola ajuae [ ]
s) Je una hamu gani ya kutaka kujua mengi kuhusu saratani ya korodani?
Hamu ya juu zaidi [ ] hamu ya kawaida [ ] sina hamu ata [ ]
sijali kitu [ ]
t)  i) Kulingana na ukoo wako, kuna jina ambalo saratani ya korodani huitwa?
ndio [ ] la [ ].
ii) kamajina lipo, ni lipi?……………………………………

D) Ufahamu, Ujuaji na habari za uchunguzi wa ungonjwa wa saratani ya
Korodani na Anayejibu maswali
a) i) Je ushawahi kusikia uchunguzi wa saratani ya korodani? ndio [ ] la [ ]
ii) kama ndivyo, ulisikia kutoka wapi?
b) i) Je uafikiri ati uhatarini zaidi ya kuipata saratani ya korodani, kuliko wanawme wengine?
   Nakubali mno [ ] nakubali [ ] sikubali [ ] sikubali kabisa [ ]

   ii) Huenda nitashikwa na ungonjwa wa saratani ya korodani siku za usoni
   Nakubali mno [ ] nakubali [ ] sikubali [ ] sikubali kabisa [ ]

   c) Je kama umewahi kuchunguzwa ungonjwa wa saratani ya korodani, ni utaratibu gani ulitumiwa?
   Prostate specific antigen (PSA) [ ] Direct rectal examination (DRE) [ ]
   Biopsy [ ] sijui [ ]

   d) i) Je wamjua mtu yeyote ambaye ameshajunguzwa ungonjwa hu wa saratani ya korodani? ndio [ ] la [ ]

   ii) kama ndivyo, wanakuhusi vipi?
   Mja wa familia [ ] mjomba [ ] rafiki [ ]

   e) Nina amini ati hakuna chochote nina weza kufanya kujikinge na saratani ya korodani: Nakubali mno [ ] nakubali [ ] sikubali [ ] sikubali kabisa [ ]

   f) Huenda chochote nikulapo, kikalenga kama nitapata ungonjwa wa saratani ya korodani:
   Nakubali mno [ ] nakubali [ ] sikubali [ ] sikubali kabisa [ ]

   g) i) Je, ungalitaka kujua mengi kuhusu uchunguzaji wa saratani ya korodani?
   ndio[ ] la [ ]

   ii) Kama ni la, huenda ikawa ni sababu ya:
   Ni na ogopa kujua [ ]
   Sina haja ya kujua zaidi [ ] Mola analinda watu wake [ ]
   Haina manufa, nikichunguzwa au la [ ] sitaki kujua [ ]
   Sina habari amabapo nitapata taarifa [ ]

   i) Kuchunguzwa saratani ya korodani ni aibu kwangu
   Nakubali mno [ ] nakubali [ ] sikubali [ ] sikubali kabisa [ ]

   j) Je kulingana na taarifa uliyo nayo, ni mara gapi unastahili kuchunguzwa kama una: saratani ya korodani?
   Kila mwaka [ ] kila miaka miwili [ ] kila miaka mitatu [ ] sina habari [ ]

   k) Je kulinga na maoni yako, kwanini wanaume hawazwe kuchunguzwa saratani ya korodani?
   Upungufu wa taarifa [ ] Uoaga [ ] kuto jali [ ]
   Mola awalinda wote, kwanini ujali [ ]

   l) i) Je, unajua majina ya taratibu zozote za uchunguzaji wa saratani ya korodani? Ndio [ ] la [ ]

   ii) Kama ndivyo, umewahi kusikia hizi taratibu za uchunguzi?
   Prostate screening antigen (PSA) assay testing Yes [ ] No [ ]
   Digital rectal examination (DRE) Yes[ ] No [ ]
   Engrailed-2 (EN2) Yes [ ] No [ ] zinginezo......................

   iii) Je ulipata wapi taratibu hizi za uchunguzi wa kansa ya korodani?
   Hospitalini [ ]. Daktari [ ], famacia [ ], marafiki [ ], mjomba [ ], radio [ ],
   runinga[ ], magazeti [ ], sikumbuki [ ]

   n) Mwanaume anaweza kuwa na ungonjwa wa saratani ya korodani bila ya
maumivu au dalili (onyo)
Kweli [ ] uwongo [ ] sijui [ ]
o) Niki shika ungonjwa wa saratani ya korodani, sitaishi zaidi ya miaka mitano
Nakubali mno [ ] nakubali [ ] sikubali [ ] sikubali kabisa [ ]
p) Kama mwanaume imeshapa ungonjwa wa saratani ya korodani, basi muda
ushapita wa matibabu
Nakubali mno [ ] nakubali [ ] sikubali [ ] sikubali kabisa [ ]
q) Saratani ya korodani itakumaliza isijalishe ni lini ilipo zinduliwa au ni
matababu gani ambayo yana tumika
Nakubali mno [ ] nakubali [ ] sikubali [ ] sikubali kabisa [ ]
r) Wanaume wanaogopa uchunguzi wa saratani ya korodani, ati huenda wako
na ungonjwa huu: Nakubali mno[ ] nakubali[ ] sikubali[ ] sikubali kabisa[ ]
s) Huenda ikawa wanaume wengine hawataki kujua kama wana ungonjwa wa
saratani ya korodani, kwa sababu hawataki kujua kifo kikaribu
Nakubali mno [ ] nakubali [ ] sikubali [ ] sikubali kabisa [ ]
t) hua nina kula chakula abacho hakina mafuta (itokayo kwa wanyama) mengi
hata kamwe [ ] mara kwa mara [ ] mara nyingi [ ] kila wakati [ ]
u) Mimi hulenga kula mboga kwa chakula changu, kila siku
hata kamwe [ ] mara kwa mara [ ] mara nyingi [ ] kila wakati [ ]
v) Mimi hufuata mpangilio mwafaka wa kunyosa misuli
hata kamwe [ ] mara kwa mara [ ] mara nyingi [ ] kila wakati [ ]
w) Mimi hushauriana afya yangu na watalamu wa afya
hata kamwe [ ] mara kwa mara [ ] mara nyingi [ ] kila wakati [ ]
x) mimi husoma na kutizama kwenge runinga mabo kuhusu kuboresha afya
yangu hata kamwe[ ] mara kwa mara[ ] mara nyingi[ ] kila wakati [ ]

Fomu ya Ruhusa
Fomu hi ya ruhusa niya wanaume miaka thalathini na zaidi ambao wako
kwenge sampuli ilio changuliwa na mchunguzi mkuu.Tonawasihi wanaume
hawa kujihusisha na uchunguzi huu wa “Utabulizi, ufahamu, hisi za kinafsi na
matumizi ya uchunguzi kuhusu saratani ya korodani kwa wanaume Counti ya
Nairobi”

Mchunguzi Mkuu: P. K. Wanyagah
Chuo: Kenyatta University-School of Public Health
Wasimamizi wakuu: Dr. Tom Were and Dr. Bonventure Michael Okello-Agina

Fomu hi ya Ruhusa ipo na sehemu tatu:
Ukrasa wa taaraifa (inayo kuelezea maana ya uchunguzi huu)
Cheti cha sahihi
Ujumbe wa Mchunguzi Mkuu

Sehemu ya Kwanza:

Ukrasa wa taaraifa
Majina yangu ni P.K. Wanyagah, mwanafunzi wa Kenyatta University, Shule ya Public Health. Nina chunguza Utabulizi, ufahamu, hisi za kinafsi na matumizi ya uchunguzi kuhusu Saratani ya korodani kwa wanaume wa County ya Nairobi. Uchunguzi huu una lengo la kutambua kansa ya korodani kwa mapema iwezekanavyo, ili kuto huduma za matibabu kwa wanao uguoa ongonjwa huu kwa haraka na mapema, bila garama kubwa

Ninawaalika wote kwenye uchunguzi huu, na unaweza kukubali kushiriki mara moja au baadae.

Utapata nafashi ya kuuliza maswali, kabla kukubali au la. Kubumka kuuliza ufanuzi wa maneno ambayo ni magumu ama sentensi zisizoeleweka.

Kumbuka, unaweza kuwasilia nami iwapo kuna jambo lolote ungalipenda lifanafunwi

Ukikubali kujiunga na uchunguzi huu, kumbuka kuna taarifa za kibinafsi ambazo totazichukua kuhusu kansa ya korodani. Tungalipenda kukuha kishina yakwamba, taarifa zote ambazo totazichukua ni za siri, na azitandikwa majina yakwako, wala kuonyenshwa watu wengine.

Kwenye uchunguzi huu, utaulizwa maswali ambayo hayatakuwa na mathara yeyote.

Kubuka, ujalazmishwa kushiriki kwa zoezi hili, na unaweza kujiunga na wakati wote, ukitaka. Taarifa yote ambayo tutakayoipokeo itatumika tu kwa utafiti huu.

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P.O. Box 43884, Nairobi 00100  
Email: director-crd@ku.ac.ke  
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P.O. Box 43844, Nairobi 00100, Tel 8710901

Principle researcher:  
P. K. Wanyagah,  
P.O. Box 70052, Nairobi 00400  
Mobile phone # 0722……………

Sehemu ya Pili:

Cheti cha Sahihi


Nimeshalewa pia matokeo ya uchunguzi huu, huenda yakaninufaisha kwa jambo moja au lingine maishani mwangu
Masimulizi ya Shahidi, kama Anayejibu Maswali hajui kusoma na kwandika

Nimeshuhudia usomaji wa fomu hii ya Ruhusa kwa Atakayejibu Maswali. Mshiriki amepata fursa ya kuuliza maswali na yamejibiwa vyema. Ninatia usahidi Mshiriki ana shiriki kwenye zoezi hili bila ya kalazimishwa

Jina la Shahidi……………………………………………………………………………………………………………………………
Sahihi ya Shahidi……………………………………………………………………………………………………………………
Tarehe…………………………………………………
Siku/Mwezi/Mwaka

Sehemu Ya Tatu:

Ujumbe wa Mchunguzi Mkuu
Naapa kwamba nime msomea mshiriki taarifa yote ya uchunguzi huu, na ninaami yakwamba, Mshiriki ameelewa maana ya uchunguzi huu. Kutoshiriki kwa zoezi hili, na Mshiriki, hakutamthuru yeye kwa jambo lolote.

Tutaweka kwa siri taarifa zote ambazo tutakozichukua. Huenda matooke ya uchunguzi huu yakachapishwa ili kuongeza fahamu zaidi kuhusu kansi korodani.

Nina thibitisha Mshiriki alipewa fursa ya kuuliza maswali kuhusu zoezi hili, na maswali yote yalijibiwa kikamilifu. Nina thibitisha Mshiriki hakulazmishwa kushiriki kwa uchunguzi huu. Fomu ya ruhusa imeonyesha na kuachwa na Mshiriki

Jina la Mchunguzi ambaye anachukua ruhusa ya Mshiriki …………
Sihiji ya Mchunguzi ambaye anachukua ruhusa ya Mshiriki …………
Tarehe………………………………………………………………………………………………………………………………
Siku/Mwezi/Mwaka

Alama ya Kidole Cha Gumba cha Mshiriki kama hajui kusoma na kuandika
Appendix C: The Map of the Nairobi County
Appendix D: Kenyatta University ethics approval letter

KENYATTA UNIVERSITY
ETHICS REVIEW COMMITTEE

Fax: 8711242/8711975
Email: kuerc.chairman@ku.ac.ke
        kuerc.secretary@ku.ac.ke
Website: www.ku.ac.ke

P. O. Box 43844,
Nairobi, 00100
Tel: 8712901/12

Our Ref: KU/R/COMM/51/26-2

Date: February 21st, 2012

Wanyagah Paul
School of Public Health,
Kenyatta University
P.O. Box 43844, Nairobi.

Dear Mr. Wanyagah,

APPLICATION NUMBER PKU016/113 OF 2012 - 'DETERMINANTS OF AWARENESS OF PROSTATE CANCER SCREENING AMONG MEN IN NAIROBI' - VERSION 2.

1. IDENTIFICATION OF PROTOCOL.
The application before the committee is with a research topic 'Determinants of awareness and up-take of prostate cancer screening among men in Nairobi' VERSION 2, dated 20th February 2012.

2. APPLICANT

Wanyagah Paul
School of Public Health,
Kenyatta University
P.O. Box 43844, Nairobi.

3. SITE

Households in Nairobi County, Kenya.

4. DECISION REACHED.
The committee has considered the research protocol in accordance with the Kenyatta University Research Policy (section 7.2.1.3) and the Kenyatta University Ethics Review Committee Guidelines, and is of the view that against the following elements of review,

i. Scientific design and conduct of study,

ii. Recruitment of research participant,

iii. Care and protection of research participants,

iv. Protection of research participant's confidentiality,

v. Informed consent process,

vi. Community considerations.

AND APPROVED that the research may proceed for a period of ONE year from 21st February, 2012.
Note: This approval supersedes the one dated December 6th, 2011

5. ADVICE/CONDITIONS
   
   i. Progress reports are submitted to the KU-ERC every six months and a full report is submitted at the end of the study.
   
   ii. Serious and unexpected adverse events related to the conduct of the study are reported to this board immediately they occur.
   
   iii. Clearance must be obtained for transportation of any biological material out of the study site i.e. Kenyatta University.
   
   iv. Notify the Kenyatta University Ethics Committee of any amendments to the protocol.

If you accept the decision reached and advice and conditions given please sign in the space provided below and return to KU-ERC a copy of the letter

[Signature]

PROF. NICHOLAS K. GIKONYO
CHAIRMAN ETHICS REVIEW COMMITTEE

[Signature]

I………………………………………… accept the advice given and will fulfill the conditions therein.

Signature……………………………. Dated this day of…………………………….. 2012.

cc. Vice-Chancellor
   Director: Institute for Research Science and Technology
Appendix E: National Council for Science and Technology permit

REPUBLIC OF KENYA

NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY

Our Ref: NCST/RR1/12/1/MED 011/176

Date: 17th, May, 2012

Paul Wanyagah
Kenya University
P.O BOX 43844
NAIROBI

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on "Determinants of awareness and uptake of prostrate cancer screening among men in Nairobi." I am pleased to inform you that you have been authorized to undertake research in Nairobi Province for a period ending 30th October, 2013.

You are advised to report to the District Commissioners, the District Education Officers and District Medical Officers of Health, Selected Districts before embarking on the research project.

On completion of the research, you are expected to submit two hard copies and one soft copy in pdf of the research report/thesis to our office.

DR. M.K. RUGUTT, PhD, HSC
DEPUTY COUNCIL SECRETARY

Copy to:

The District Commissioners
The District Education Officers
The District Medical Officers of Health
Selected Districts

"The National Council for Science and Technology is Committed to the Promotion of Science and Technology for National Development."
Appendix F: Informed consent forms

This Informed Consent form is for household males 30 years and above in the sample frame. We are requesting these males to participate in this research project whose title is “Prostate cancer awareness, knowledge, perception on self-vulnerability and uptake of screening among men in Nairobi County.”

Principal investigator: P. K. Wanyagah
Institution: School of Public Health – Kenyatta University
Supervisors: Dr. Tom Were and Dr. Bonventure Michael Okello-Agina

This informed consent has three parts:
Information sheet (to share information about the research with you)
Certificate of Consent (for signatures if you agree to take part)
Statement by the researcher
You will be given a copy of the full Informed Consent Form.

Part I: Information sheet
My name is P. K. Wanyagah a Post-Graduate student at the Kenyatta University School of Public Health. I am carrying out a study to determine awareness and uptake of prostate cancer screening among men in Nairobi. This study aims at improving early detection of prostate cancer enhance diagnostic capabilities leading to improved health and reduced morbidities and mortalities associated with the disease.

I am inviting you to participate in this study and you are free to either agree immediately after receiving this information or later after thinking about it. You will be given the opportunity to ask questions before you decide and you may talk to anyone you are comfortable with about the research before making a decision. After receiving this information concerning the study, please seek for clarification from either myself or my assistant if there are words or details which you do not understand.

If you agree to participate, you will be asked to provide personal information and other details related to prostate cancer. All the information, which you provide, will be kept confidential and no one but the researchers will see it. The information about you will be identified by a number and only the researchers can relate the number to you as a person. Your information will not be shared with anyone else

Your involvement in this research will be through an interview only and you will not expose yourself to any risks if you consent to participate. Your participation is voluntary and refusal to participate in the research or withdrawal from it will not affect you in any form whatsoever. All the information that you give us will be used for this research only.
This proposal has been reviewed and approved by the Kenyatta University Ethics review Committee whose work is to make sure research participants like your self are protected from harm. It was submitted to them through the School of Public Health of the Kenyatta University with the approval of my two university supervisors, highlighted below. The contact information of these people is given below if you wish to contact any of them for whatever reason;

Director, KU-ERC  
P.O. Box 43884, Nairobi 00100  
Email: director-cr@ku.ac.ke  
Website: www.ku.ac.ke

Chairman, School of Public Health – Kenyatta University  
P.O. Box 43844, Nairobi 00100  
Tel 8710901

Kenyatta University research supervisors  
Dr. Tom Were,  
Department of Pathology,  
School of Health Sciences,  
Kenyatta University  
P.O. Box 43844, Nairobi 00100, Tel 8710901

Dr. Bonventure Michael Okello-Agin,  
Dean School of Health Sciences  
Department of Obstetrics and Gynecology  
Kenyatta University  
P.O. Box 43844, Nairobi 00100, Tel 8710901

Principle researcher:  
P. K. Wanyagah,  
P.O. Box 70052, Nairobi 00400  
Mobile phone # 0722……….

Part II: Consent certificate  
I………. (signature)………………………………………………freely give consent of myself to take part in the study conducted by P.K. Wanyagah, the nature of which has been explained to me by him/his research assistant. I have been informed and have understood that my participation is entirely voluntary and I understand that I am free to withdraw my consent at any time if I so wish. The results of the study may directly be of benefit to me.
Statement by the witness if participant is illiterate
I have witnessed the accurate reading of the consent form to the participant, and the individual has had the opportunity to ask questions. I confirm that the individual has given consent freely.

Name of witness

Signature of witness

Date

Day/Month/Year

Thumb print of participant if illiterate (a witness must sign below)

Part III: Statement by the researcher
I have accurately read out the information sheet to the participant, and to the best of my ability made sure that the participant understands that the following will be done:
Refusal to participate or withdrawal from the study will not in any way compromise the interviewee.
All information given will be treated with confidentiality.
The results of this study might be published to facilitate increased awareness on matters prostate cancer.
I confirm that the participant was given an opportunity to ask questions about the study, and all the questions asked by the participant have been answered correctly and to the best of my ability. I confirm that the individual has not been coerced into giving consent, and the consent has been given freely and voluntarily.

A copy of this Informed Consent Form has been provided to the respondent.

Name of researcher taking consent

Signature of researcher taking the consent

Date

Day/Month/Year