FACTORS INFLUENCING UPTAKE OF PROSTATE CANCER SCREENING AMONG MEN AGED 40YEARS AND ABOVE IN MUKONO MUNICIPALITY, UGANDA

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MASTER OF PUBLIC HEALTH

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FACTORS INFLUENCING UPTAKE OF PROSTATE CANCER SCREENING AMONG MEN AGED 40YEARS AND ABOVE IN MUKONO MUNICIPALITY, UGANDA

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A Thesis Submitted to the School of Graduate studies, Bugema University, in Partial Fulfillment of the Requirement for Award of the Degree of Master in Public Health, Bugema University

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ACCEPTANCE SHEET

This thesis entitled "**UPTAKE OF PROSTATE CANCER SCREENING AMONG MEN AGED 40YEARS AND ABOVE IN MUKONO MUNICIPALITY, UGANDA"**, prepared and submitted by **MUTUMBA ROBERT,** in partial fulfillment of the requirement of the degree of **MASTER OF PUBLIC HEALTH**, is hereby accepted;

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DECLARATION

I, Mutumba Robert, declare that this Thesis titled **"Uptake of Prostate Cancer screening among men aged 40years and above in Mukono Municipality, Uganda"** is my original work and has never been submitted to Bugema University or any other Institution of higher learning for any award.

Sign_____

Mutumba Robert

Date: _____

DEDICATION

This thesis is dedicated to my Mother; Ms. Nanyonjo Masitura, Wife; Allen Nantongo, Brother; Richard Kimuli and Dr. Isaac Ddumba. You supported me so much and may the Almighty God bless you abundantly.

BIOGRAPHIC SKETCH

Mutumba Robert was born on 11th November 1983 to Mr. Anthony Sempa and Ms. Nanyonjo Masitura in Luwero District, Uganda. He went to Katikamu Kisule Primary School from 1991 - 1997 where he sat his Primary Leaving Examinations (PLE) and later joined Katikamu SDA Secondary School in 1998 - 2003 for Ordinary and Advanced Level education.

In 2004, he joined Mbarara University of science and Technology (MUST), where he graduated with a Bachelor of Medicine and Bachelor of Surgery (MBChB) in January 2010. The author has worked in public service at different levels as a Medical Officer, Senior Medical Officer and Acting District Health Officer. He has also worked with local and international NGOs such as University research Organisation, Intrahealth International, and has attained many professional short courses covering different areas including, Non-communicable disease control, Comprehensive HIV/AIDS care for Medical doctors in Africa, Quality improvement, Nutrition, Fraud and abuse, Monitoring and Evaluation, Good Clinical research practice, Leadership development, US abortion and family planning requirements, among others, with a diversity of working experience.

The author has nine years of working experience in Health systems programming, implementation science, Operational Research, and community health in both the public and private not for profit sectors. He also participates in training, coaching and mentoring health workers in the delivery of high quality reproductive maternal, newborn and adolescent health care (RMNCAH) services using quality improvement (QI) approaches, among other duties.

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Special thanks to TASO Research and Ethics Committee for granting me ethical approval to conduct this study and the leadership of Mukono Municipality for allowing me to carry out the study in their communities, the respondents for their time, honesty and voluntary participation in this study. I would also like to thank my research assistants; Iga Ibrahim, Moses Kyebagada and Simon Kaddu for their support during data collection in the villages, my classmates; Kabugo Daniel, Mbambu Betty and Menya

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LIST OF ACRONYMS AND ABBREVIATIONS

Ca	Cancer
CME	Continuous Medical Education
CVD	Cardio-vascular disease
DRE	Digital Rectal Examination
FGD	Focus group discussion
HBM	Health Belief Model
HFs	Health facilities
IRB	Institution Review Board
KIIG	Key Informant Interview Guide
LC	Local council
MOH	Ministry of Health
NHPC	National Housing Population Census
PC	Prostate Cancer
PI	Principal Investigator
PNFP	Private Not For Profit
PFP	Private For Profit
PMT	Protection Motivation Theory
PSA	Prostatic Surface Antigen
QI	Quality improvement
SPSS	Statistical Packages for Social Scientists
SEM	Socio Ecological Model
UBOS	Uganda Bureau of Statistics
UCI	Uganda Cancer Institute
UPE	Universal Primary Education
WHO	World Health Organization
NGO	Non - Governmental Organisation
RMNCAH	Reproductive Maternal, Newborn, Child and Adolescent Health

ABSTRACT

MUTUMBA ROBERT, School of Graduate Studies, Bugema University, SEPTEMBER, 2018. **"UPTAKE OF PROSTATE CANCER SCREENING AMONG MEN AGED 40YEARS AND ABOVE IN MUKONO MUNICIPALITY, UGANDA."**

Advisor: Professor David Ndungutse

Worldwide, prostate cancer (PC) remains the most common cancer among men aged 40years and above. In sub-Saharan Africa, routine screening for PC has remained low, leading to reduced detection rates, poor management and increased mortality from the disease. The study was carried out in Mukono Municipality, Uganda to determine the individual characteristics and health system factors that influence uptake of PC screening among men aged 40years and above in order to inform the design of appropriate interventions for improving early detection and treatment outcomes of men who develop prostate cancer

Using a cross sectional study design with both quantitative and qualitative approaches, the study employed simple random sampling techniques to collect data from 385 men aged 40years and above. Data was later analyzed using descriptive statistics to derive means, frequencies and standard deviations as well as inferential statistics to derive odds ratios and significances using logistic regression and multivariate analysis. Key informant interviews were purposively conducted to add power to the study.

The study found out that more than half 212 (55%) of the respondents were men aged 40 - 50years, with post-primary 245 (63.6%) as their highest level of education. Majority 308 (80%) of the respondents were married, 316 (82.1%) were Christians while 294 (76.4%) were informally employed. More than half 209 (54.3%) of the respondents lacked knowledge on PC screening, while 197 (51%) were not aware of the consequences of Prostate cancer. Uptake of PC screening was very low at 8%. The study concluded that occupation, awareness of consequences of PC and knowledge levels on PC screening significantly influence uptake of PC screening. The study recommends that community awareness and knowledge levels on PC screening needs to be increased to achieve increased uptake levels for PC screening among men at risk of developing the disease.

CHAPTER ONE

INTRODUCTION

Background to the Study

Worldwide, prostate cancer (PC) remains the most common cancer among men aged 40years and above contributing to 16.4% of all cancers in men, with over 59,500 new cases per year (Wabinga *et al.,* 2014). Demographic and health transitions have led to the shift in disease patterns globally. Over the past five years, 14.9 million new cases of cancers and 8.2% PC related deaths have been reported (Torre *et al.,* 2015).

Prostate cancer is a slow progressing disease of the male prostate gland. The gland is a small structure about the size of a walnut at the base of a man's bladder in front of the rectum, surrounding the urethra just below the bladder. Prostate cancer often does not produce any symptoms in its early stages, which is why many cases are not detected until it has spread beyond the prostate (Ferlay *et al.,* 2010).

Early screening of cancers provides a golden opportunity for early detection (Roobol *et al.,* 2009) and control of cancers globally. In developed countries, screening for prostate cancer using the serum Prostatic Specific Antigen (PSA) has led to early detection and management of the disease. Nevertheless, this practice remains a challenge in most of the developing countries. According to the situation analysis done by the World Health Organization (2014) in 38 developing countries, it was revealed that only 18% of men go for prostate cancer screening (Bann, 2014).

In sub-Saharan Africa, routine screening for prostate cancer has remained low, leading to reduced detection rates, poor management and increased mortality from the disease (Ajape *et al.,* 2009) with 2 in 10 (20%) of men aged 40 years and above reported

to be burdened with prostate cancer (Ferlay *et al.,* 2010). New cases of prostate cancer are commonly observed in Zimbabwe and Uganda, with incidence rates of 38.1 and 37.1 per 100,000 respectively.

Documented barriers for earlier screening are multi-factorial that include; individual, interpersonal, community, health systems and policy environment. Unpacking such barriers can offer a golden opportunity to underscore the strategies in improving men's ability to screen for prostate cancer early.

Although early detection through routine screening is an integral component of a successful prevention and prostate cancer (PC) therapy, the practice is hardly observed among majority of men in Uganda (only 14%), especially those above the age of 40years who are at risk of developing the disease. Furthermore, studies done in Uganda revealed that over 80% of men present late, with advanced PC, thus succumbing to the disease (UCI, 2016).

Most men in Uganda are not aware of PC screening modalities and hardly concentrate on the urinary symptoms that present with prostate cancer. Consequently, due to poor routine PC screening, majority (87.5%) of the men in Uganda present in advanced stages of prostate cancer (Wabinga *et al.,* 2014).

For many men, a diagnosis of prostate cancer can be frightening, not only because of the threat to their lives, but because of the threat to their sexual function. However, if prostate cancer is detected early enough through screening, while it is still confined to the prostate gland, there is a better chance of successful treatment with minimal or short-term side effects. Successful treatment of cancer that has spread beyond the prostate gland is very difficult.

In Uganda, approximately 1.8 million new cases of prostate cancers are reported annually (Wabing*a et a*l., 2014). However, the actual number of cases is thought to be higher than those reported. In Mukono municipality, as compared to other municipalities in Uganda, despite the numerous sensitization efforts on the importance of PC screening among men at risk of the disease, only 10% of men aged 40years and above (Mukono District Health Sector Annual performance report, 2017) go for PC screening, even when these services are made readily available at no cost by some of the implementing partners. Since the Uganda health care system largely focuses on curative services, preventive services are hardly prioritised. This study was undertaken to

Statement of the Problem

According to the Uganda Cancer Institute, (2016) only 14% of Ugandan Men aged 40 years and above screen for prostate cancer every year. Despite the increase in prostate cancer (PC) cases among Ugandan men aged 40years and above and the opportunity for early detection of PC cases offered by early screening, most men do not like going for routine screening for PC at health facilities (Uganda Cancer Institute, 2016). A study done in Mulago National referral hospital, Uganda estimates that more than 80% of men are diagnosed with prostate cancer in the advanced stages (UCI, 2016). The consequences of late detection of PC not only possess a negative impact on an individual, but also the community, economic development and cost of the health care system.

In Mukono municipality, compared to other municipalities in Uganda, despite the numerous sensitization efforts on the importance of PC screening among men at risk of the disease, through radio talk shows and other community outreach programs supported

by the district health office, Rotary community hospital, and many other implementing partners (IPs), only 10% of men aged 40years and above (Mukono District Health Sector Annual performance report, 2017) go for PC screening, even when these services are made readily available at no cost by some of the IP's during the delivery of integrated health care services in the community. The serum Prostatic Surface Antigen (PSA) tests are available at the Private Not for Profit (PNFP) and Private for profit (PFP) hospitals and clinics but offered at a cost. At some public health facilities, especially health center IVs and hospitals, serum PSA samples are taken off and sent to Mulago national referral hospital and other private clinical laboratories for testing. This study was undertaken to determine the main factors that influence uptake of PC screening among men aged 40years and above in Mukono Municipality, Uganda.

Research Questions

The study was guided by the following research questions;

1. What are the individual characteristics that influence uptake of PC screening among men aged 40years and above in Mukono Municipality, Uganda?
2. What are the health system factors that influence uptake of PC screening among men aged 40years and above in Mukono Municipality, Uganda?
3. What is the level of uptake for PC screening among men aged 40years and above in Mukono Municipality, Uganda?
4. Do individual characteristics and health system factors influence uptake of PC screening among men aged 40years and above in Mukono Municipality, Uganda?

General Objective of the Study

The general objective of the study was to determine the main factors that influence uptake of PC screening among men aged 40years and above in Mukono Municipality, Uganda in order to inform the design of appropriate interventions for improving early detection and treatment outcomes of men who develop prostate cancer

Specific Objectives

1. To find out the individual characteristics that influence uptake of PC screening among men aged 40years and above in Mukono Municipality, Uganda.
2. To assess the health care system factors that influence uptake of PC screening among men aged 40years and above in Mukono Municipality, Uganda.
3. To determine the level of uptake of PC screening among men aged 40years and above in Mukono Municipality, Uganda.
4. To establish whether there is a significant influence of individual characteristics and health system factors on uptake of PC screening among men aged 40years and above in Mukono Municipality, Uganda.

Hypothesis of the Study

i) There is no significant influence of individual characteristics on uptake of PC screening among men aged 40years and above in Mukono Municipality, Uganda.

ii) There is no significant influence of health system factors on uptake of PC screening among men aged 40years and above in Mukono Municipality, Uganda.

Significance of the Study

The study findings will inform key stakeholders such Government (Ministry of Health), district officials, key decision makers, Health care providers, researchers, academia, Uganda Cancer Institute and men at risk of disease to contribute to the drafting of appropriate policies and designing of PC screening and control strategies for addressing the increasing burden of PC in Mukono Municipality, Uganda

Policy makers (Ministry of Health); The study findings will form a sound basis for policy makers especially the Ministry of Health's Non-Communicable Diseases division to re-think the existing intervention strategies for improving screening among men at risk of developing prostate cancer.

To the health care providers; The study will help health workers to improve on the process of screening men aged 40 and above for prostate cancer. The study will help health workers carry out continuous medical Education programs to improve their skills for better delivery of PC screening services

Clients; The study results will help men aged 40 years and above to get awareness and knowledge on prostate cancer screening, benefits and possible outcomes. Consequently, this is sought to lead to early detection and treatment, improved management of the disease and reduced cost of patient care which should enhance the quality of lives of prostate cancer patients.

To other scholars; The study findings will be useful to future researchers to identify gaps and the information obtained from this study will to inform further research.

Scope of the Study

The study was conducted in Mukono Municipality, Central Uganda. It focused on the individual characteristics and health care system factors influencing uptake of PC screening among men aged 40 years and above. The study anticipated that these age categories of men are at risk of developing prostate cancer. Individual characteristics and health care system factors provided independent variables, while uptake level of PC screening provided the dependent variable. Men aged 40years and above who had resided in Mukono municipality for the past six months prior to the study were the respondents. The scope of the study was limited to the catchment area of the study area and data was collected and analyzed between June and August, 2018.

Limitations of the Study

The study was cross sectional by nature, where data was collected at one point in time, yet it would have been longitudinal in nature for the respondents to be studied over a long duration of time to study their characteristics. A Cross sectional study by its nature cannot establish the causal relationship between PC screening and any of the independent variables. Qualitative studies with key informant interviews provided more insights. Also, due to the self-reported nature of the data, recall bias may have occurred during data collection. The researcher minimized this by requesting the respondents to give responses specific to the question asked and to be as honest as possible. The study was also limited by extraneous variables beyond the researcher's control such as personal biases.

Theoretical Framework

The study was based on the Health Belief Model (HBM) of Rosenstock (1974). The Health Belief Model is behavior focused and informs that individuals have disposition to act in reaction towards a disease that threatens life. Such reactions include seeking medical attention, which is determined by the person's awareness of personal susceptibility to and the seriousness of affliction from a particular condition among other factors compared to perceived benefits and barriers.

The theory proposes that factors related to personal susceptibility and seriousness of the disease influence the patient's perceived benefits of intervention. The interpretation of the theory is that the individual characteristics in terms of age, religion, education level, marital status, income levels, cultural beliefs, awareness of consequences, knowledge levels and perceived self-vulnerability greatly influence their health seeking behavior. According to the HBM, six constructs influence people's decisions about whether or not to take action and these are;

i) Perceived judgment/ risk of contracting the infection.
ii) Perceived seriousness, clinical consequences, disability, pain or death from a condition with impact on life style, working ability and social relationships.
iii) Perceived benefits of an action in reducing the health risk and facilitate uptake.
iv) Perceived barriers to action, how they benefit the person compared to the perceived costs for their behavior.
v) A stimulus or cue to action when a person is motivated, can perceive a beneficial action, and trigger prompt engagement in health-promoting behaviors.

vi) Self-efficacy as an individual's perception of competence to successfully perform a health behavior change.

However, the HBM assumes that people have the skills to alter the behavior while ignoring the social context of behaviors by not accounting for social related factors beyond the individual that influence health behavior.

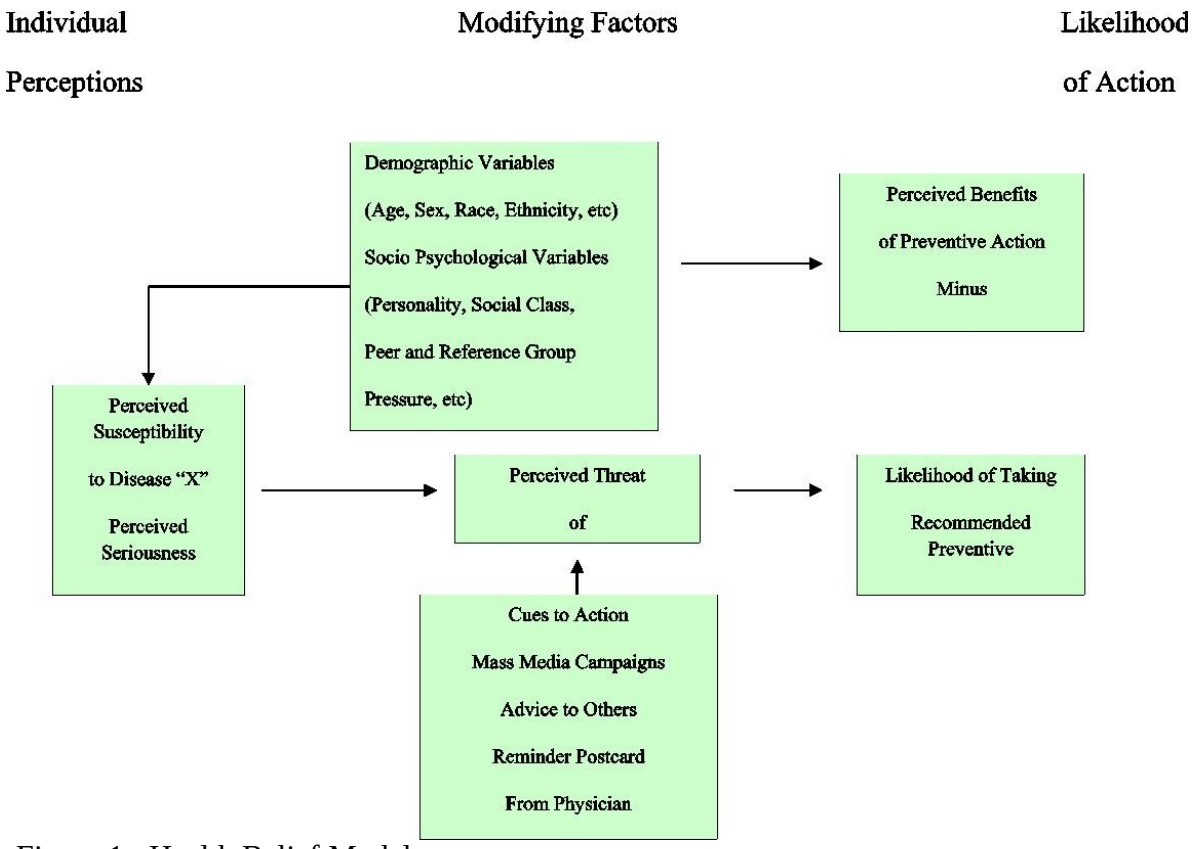

Figure 1: Health Belief Model

In failure to address social, environmental and policy interactions, the study adopted the Socio Ecological Model (SEM), chosen because it addresses the determinants of health behaviors beyond the individual and as well as recognizes the influence of peers, communities, organizational and policy environment on uptake of PC screening.

SEM aims at understanding the multifaceted and interactive effects of personal and environmental factors that determine behaviors. It also helps in identifying behavioral and organizational leverage points and intermediaries for health promotion within organizations through its five nested, hierarchical levels that include; the individual, interpersonal, community, organizational and policy/enabling environment. It is thus a very effective approach to public health prevention and control since it uses a combination of interventions at all levels of the model.

Figure 2: Socio-ecological Model

The theory assumes that interpersonal factors such as friends and family, community factors, organizational/health system factors and the national health policies on prostate cancer influences uptake of PC screening. In relation to the study, uptake of PC screening was the dependent variable, which can be influenced by a combination of both individual characteristics and health care system factors. Individual characteristics such as age, religion, education level, marital status, income levels, cultural beliefs, awareness of consequences, knowledge levels and perceived self-vulnerability and

health system factors such attitude of health workers, perceived affordability, client satisfaction and privacy issues were the independent variables.

Conceptual Framework

The conceptual framework (Figure 3) schematically illustrates the hypothesized relationship between the independent and dependent variables, showing how the different factors operate at different levels to influence uptake of prostate cancer screening among men aged 40years and above in Mukono Municipality. The dependent variable is the uptake of prostate cancer screening among men aged 40years and above in Mukono Municipality, Uganda.

The independent variables were individual characteristics such as; age, religion, education level, marital status, income levels, cultural beliefs, awareness of consequences, knowledge levels and perceived self-vulnerability. Health care system factors such as; attitude of health workers, perceived affordability, client satisfaction and privacy issues, all of which have an influence on uptake of PC screening were determined.

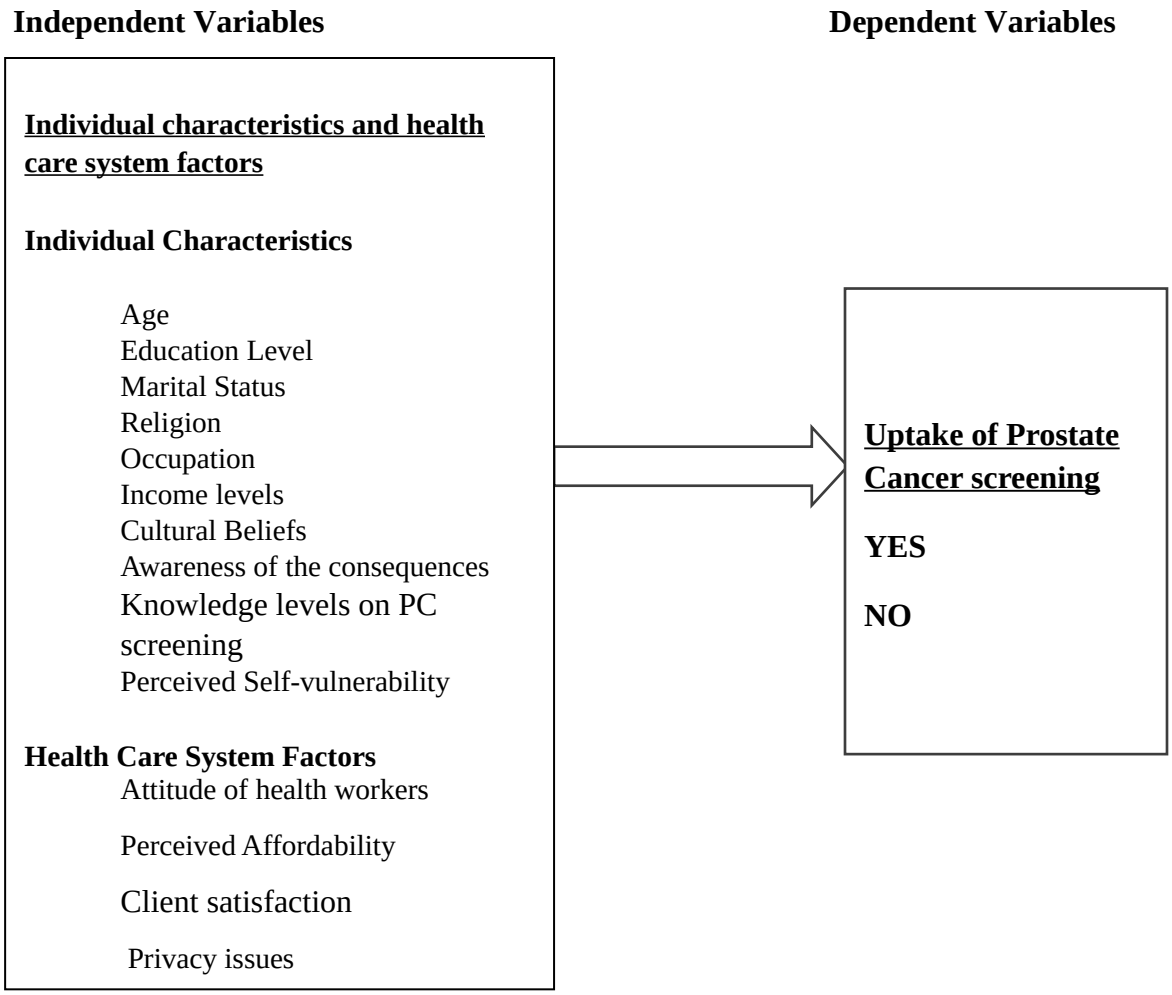

Figure 1: Conceptual Framework

Operational Definitions of Terms

Operational definition of terms in this study included the definitions of the different dependent and independent variables in the study where the independent variables included the individual characteristics and health system factors while the dependent variable was uptake of PC screening. The terms were arranged according to the study objectives and were operationally defined as;

Individual Characteristics of Respondents

The individual characteristics of men aged 40years and above that were operationalized in this study included; age, education level, religion, marital status, occupation, cultural beliefs, awareness of the consequences of prostate cancer, knowledge levels on PC screening and perceived self-vulnerability.

Age of Respondent: In this study, age refers to how old an individual was at the time of study. This was measured and recorded as actual years such as 40, 45 or 60 years. This was further categorised and measured at ordinal scale of; 1= (40-45years), 2= (46-50 years), 3 = (51-55years) 4 = (56 years and above).

Education Level: In this study education level refers to the highest level of formal schooling attained by the respondent. It was measured nominally using an ordinary scale of 1= never been to school, 2= primary (P1-P7 level) as low formal education, 3= secondary level (S1- S6) as moderate formal education, 4= post–secondary education (diploma and above) as high formal education. It was recorded using the actual class the respondent reached. For example primary two, senior three.

Marital Status: In this study, marital status was the description of a person's relationship with another person which was measured nominally as 1 = Single (never married), 2 = Married/cohabiting (stays with partner), 3 = Divorced/separated (ever been married but stays alone) and 4 = widowed (lost his wife)

Religion: In this study, religion refers to the respondent's religious denomination. This was measured on a nominal scale and recorded as 1= Catholic, 2= Protestant, 3= Seventh Day Adventist (SDA), 4= Muslim, 5=Pentecostal and 6= for any other religious affiliations.

Occupation; This refers to the job that the respondent was undertaking so as to earn a living. This was recorded as the responded stated it and later categorized and measured on nominal scale of 1= Civil servant, 2= NGO/Private 3= Businessman, 4= Casual laborer and 5= Not employed.

Income Levels: In this study, this meant how much the respondent earned per month. It was measured and recorded as 1==< 30,000/= (Very low income), 2= 30,000 - 200,000/= (Low income), 3= 200,001 - 500,000/= (Minimal income), 4= 500,001 - 1,000,000/= (Moderate income) and 5= > 1,000,000/= (High income).

Cultural Beliefs; This refers to those other individual's alternative beliefs which may have affected uptake of PC screening. This was measured and recorded as 1= strongly believe in them 2= believe in them 3= don't believe in them at all and 4= don't know about them

Awareness of the Consequences: This refers to whether the respondent had information on the implications of being diagnosed with prostate cancer. It was recorded as 1= Yes (was aware of the consequences) and 2= No (was not aware of the consequences)

Knowledge level on PC Screening: This refers to whether the respondent had information on prostate cancer screening and it's the importance. It was measured as 1= Yes (had information on PC screening) and 2= No (did not have information on PC screening)

Perceived Self-vulnerability; This refers to whether the respondent was aware of his personal risk to develop prostate cancer and was recorded as 1= Yes (aware of self-vulnerability to develop prostate cancer), 2= Not aware and 3= Not sure

Health Care System Factors

In this study, the health care system factors included; Attitude of health workers, Perceived affordability, Client satisfaction and privacy issues.

Attitude of health workers; In this study the attitude of health workers refers to whether the health workers were friendly or rude during the time of screening and was measured as; 1= Positive (e.g. friendly) or 2= Negative (e.g. rude)

Perceived Affordability: Refers to whether the respondent could afford the amount of money requested inorder to receive prostate cancer screening services and was measured as; 1= Affordable and 2= Not affordable

Client satisfaction; This refers to whether the respondent was satisfied with the quality of services received at the time of PC screening and was measured by whether the respondent would recommend a friend to go for PC screening in the same health facility or not. This was recorded as; 1= Yes (Satisfied, would recommend a friend) or 2=No (Not satisfied, would not recommend a friend)

Privacy issues; This meant how comfortable the client felt in relation to the environment from where he received prostate cancer screening services. It was recorded as; 1= Satisfied with the privacy and 2= Not satisfied with the privacy

Uptake of prostate cancer screening: This meant whether the respondent had ever been tested for prostate cancer by any of the PC screening methods. It was recorded using a binary scale of 1= Yes (has ever been screened) and 2= No (has never been screened)

CHAPTER TWO

LITERATURE REVIEW

Introduction

This chapter presents the review of literature on factors influencing uptake of PC screening among men aged 40 years and above in Mukono Municipality with the associated gaps as well as some contradictions**.** The reviewed literature is presented in accordance with the main variables of the study. These are: the individual characteristics and health care system factors that influence uptake of PC screening among men aged 40 years and above in Mukono Municipality, Uganda. The documents that have been reviewed include text books, journals and internet/online resources. The review of literature is aimed at helping the researcher to have a deeper understanding of the variables under this study and identifying gaps in the literature with specific reference to this study.

Individual Characteristics and Uptake of PC Screening

The individual characteristics in review included; age, education level, marital status, religion, occupation, income levels, cultural beliefs, knowledge levels on PC screening, awareness of the consequences of PC and self-vulnerability

Age and uptake of PC Screening

Several scholars have researched about age and prostate cancer screening. Most of the scholars agreed that prostate cancer is uncommon in men younger than 40 years, but becomes more common with advancing age (Enawor*u et.a*l, 2016). However, most men are ignorant of their prostate cancer status. The lifetime risk of developing PC for men is 1 in 6 (Enawor*u et.a*l, 2016).

According to the study done by Graham *et al.* (2017) about the uptake of PC screening in a medical review, it was revealed that the chance of screening increased by advancing age from 10.3% for those 40-44years to 57.1% for men 60-64 years. Those who were older were six times more likely to screen compared to the young ones. In another study by Oladimeji *et al.* (2010) indicated that older Nigerian men had high awareness levels on PC, though their knowledge of the etiology, treatment, prevention and perception on the risk of developing the disease and uptake of screening was low.

Education Level and uptake of PC Screening

Many studies have been carried out about the education level and PC screening. Previous studies in United States indicated that patterns of change for all screening modalities for prostate cancer differed by education level, 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 *et al.,* 2001).

However, in another study by Pweinrich, & Weinrich (2011), about the predictors of uptake of PC screening among the aged black people indicated those with lower or no education were more likely to get PC screening compared to those in secondary and higher levels of education. In the United States, exposure to prostate cancer information significantly predicted screening participation. 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.

A study conducted in Ethiopia by Mwaniki (2015) revealed that uptake of PC screening was low (18.3%) and insignificantly different among those with formal and no

formal education. From this finding, uptake of prostate cancer screenings remains a key challenge.

This study concurs with the one undertaken by the World Health Organization (2014) after assessing the situation in 38 developing countries, revealed that the proportion of men going for PC screening was still low at 18% (Bann, 2014). Also studies conducted in Nigeria and Kenya by Japan International Cooperation Agency revealed that the level of uptake for PC screening among men aged 40yeara and above was very low and those go for it, reach the health facilities very late (Rushton, 2003). This low uptake level and late presentation means that men are at great risk of advanced prostate cancer, which can impact very negatively on the quality of their lives.

Marital Status and uptake of PC Screening

Many researchers have done great work about the influence of marital status to the uptake of PC screening. The reviewed literature indicates that different scholars having conflicting results and conclusions. Some conclude that marital status has got an impact on men's uptake of screening while others disagree.

According to the study by Mvale (2016) about the uptake of PC screening in a central Hospital in Zambia, reported that married men were more likely to go for screening compared to other categories. Those who lived solitary life were less likely to go cancer screening, therefore being married was a boosting factor to getting screened for prostate cancer.

In the same vein, from a cross sectional study by Lubega *et al.* (2010) in Iganga Hospital in Uganda about the barriers to the uptake of PC screening among men aged 30 years and above, it was reported that 76% of the respondents were married. However, the

single and widowed were less likely to go for PC screening compared to the married ones.

Religion and Uptake of PC Screening

A cross sectional study in Tanzania by Sylvester (2015), revealed that religion does not have significant influence on uptake of PC screening. However, Omuga *et al.* (2011) when assessing personal characteristics of men and uptake of PC screening, observed that religious factors were statistically significant determinants of uptake of PC screening at Kenyatta National Hospital, Nairobi.

However, Mwena (2015) demonstrated that there was no significant association between the individual characteristics of men above 40 years and uptake of PC screening in Central Provincial Hospital, which partly concurs with the findings in the study by Sylvester.

In Nigeria, Olufemi *et al.* (2016) reported that most respondents were Muslims, and married, in consonance with previous study findings.

Occupation and Uptake of PC Screening

A cross sectional study by Maina *et al.* (2013) about the occupation of men and uptake of PC screening in Kenya, revealed that the job one was doing did matter about the level of uptake. The civil servants were on the lower list of those taking up the screening exercise for prostate cancer. Those working in NGO and private companies were more likely to go PC screening. Causal laborers were on the furthest point at the lower end.

This is similar to results from the study done in Khartoum by Asgad *et al.* (2014) and could be explained by enthusiasm of the NGO workers due to insurance scheme towards their career. Causal laborers and government workers could not afford the screening exercise in terms of cost and time

Income Level and Uptake of PC Screening

According to Maina *et al.,* (2013) the income level of the respondents had a great impact on their uptake of PC screening as those with well-paying jobs and having insurance schemes were more likely to go for cancer screening compared to the those with lower paying jobs especially the causal laborers. This finding is supported by the observations made in the study done at Kerich Hospital in India which stated that 67.5% of those who found it easier to go for prostate cancer screening earned four times as much as those who did not find it easy

These findings are similar to the research done previously in Namibia which found out that men who were in impoverished state were less likely to go for PC screening (Guden *et al.,* 2011).

Cultural beliefs and Uptake of PC Screening

Many studies have been carried about the cultural belief and uptake of PC screening in different communities. According to Guga & Dube (2011) in the study of cultural beliefs influence on the uptake of PC screening in the observation study that was done in India, it was found that strong cultural beliefs had an impact on men having PC screening. Furthermore, a study that was undertaken among men in a tertiary care

hospital in India found that awareness regarding PC screening was low and had a strong connection to the cultural values in that area (Kumar *et al.,* 2015).

The result was not very different from the studies done in Iran in the Middle East and Nigeria in Africa, with strong cultural beliefs largely influencing the uptake of PC screening (Vrijheid *et al.,* 2009).

Knowledge Levels and Uptake of PC Screening

According to Kangmennang *et al.* (2016) in a study about what prevents men aged 40 - 64 from prostate cancer screening in Namibia, the knowledge level of the respondents, had a big impact on their uptake of PC screening and those with knowledge on PC were more likely to go for PC screening compared to those with who had no knowledge.

The finding in the study above were supported by another study done in Italy by Morland *et.al* (2017) about PC screening: knowledge, attitudes and practices, where the observations made indicated that it was easier for men who had prior knowledge about prostate to go for prostate cancer screening four times as much as those who had no knowledge.

However, the findings by Ojewola *et al.* (2017) in Nigeria in a study about knowledge attitudes and screening practices regarding PC among men older than 40 years indicated that men who had more knowledge feared to for test compared to those with less knowledge. These findings are similar to research done previously in Namibia which found that men who were more exposed to information about cancer screening were less likely to go for PC screening (Guden *et al.,* 2011).

Awareness of the Consequences of PC and Uptake of PC Screening

Many studies have been carried about the awareness of consequences and uptake of PC screening in different communities. According to Ojewola *et al.* (2017), in the study about attitudes and influence on the uptake of PC screening in Nigeria, it was found that awareness of consequences had an impact on men having PC screening.

Furthermore, in a cross-sectional study that was undertaken among men in Hamadan about the psychological predictors to PC screening for men aged 50 years and above, found that the higher the awareness regarding PC screening was the more likely these men could for screening (Barati *et al.,* 2016).

The result was not very different in studies done in Jordan in Middle East, about the predictors to PC screening intention among men, with strong awareness of consequences largely influencing the uptake of PC screening (Abuadas *et al.*, 2016).

Self-vulnerability and Uptake of PC Screening

A cross sectional study in United States of America by Bloom *et al.* (2006), about family history, perceived risk and prostate cancer screening, revealed that perceived risk had significant influence on uptake of PC screening. Older men aged 55years and above who had their parents with history of PC were seven times more likely to go for a test compared to the younger men and those who did not have family history of prostate cancer.

The results above concurred with those of another study by Ibrayev *et al*. (2013), about utilization of PC screening, the Adventist Health Study in Loma Linda, California which reported that self-perceived risk increased the PC screening by 10 folds. However,

in another study by Wong *et al.* (2017), in systematic review qualitative studies about men's perspective and uptake of PC screening, observed that self-vulnerability was not statistically significant determinant of uptake of PC screening

The above results agreed with those of Mwena (2015), in another study who demonstrated that there was no significant association between perceived risk for men above 40 years and uptake of PC screening in Central Provincial Hospital.

Health Care System Factors and Uptake of PC Screening

The Literature reviewed on each of the variable on health care system factors include; Attitude of health workers, Perceived Affordability, Client satisfaction, and privacy issues.

Attitude of Health Workers and Uptake of PC Screening

According to Heynes *et al.* (2013), in a study about what prevents men aged 40 - 64 from PC screening in South Africa, attitude of the health workers towards the patients, had a great impact on their uptake of PC screening. Men aged 40 years and above cited poor attitude of health workers hindering their going for the tests. The findings in the study above were similar to those in a study done in Uganda by Nakandi *et al.* (2013), about prostate cancer screening: knowledge, attitudes and practices, where the observations made indicated that poor health workers attitude greatly and negatively impacted on PC screening among men in Uganda.

However, the findings by the Prostate Cancer Foundation (2012), in Australia in a research awareness and support, a 10 year progress in prostate cancer indicated that good health worker relationship improved PC screening among men aged 40 years and above.

These findings are similar to research done previously in Namibia which found that good attitude of health workers increased prostate cancer screening (Guden *et al.,* 2011).

Perceived Affordability and Uptake of PC Screening Services

A cross sectional study in United States of America by Bloom *et al.* (2006), about family history, perceived affordability and PC screening, revealed that perceived affordability had significant influence on uptake of PC screening. Those who thought could not afford the testing were more likely to miss the test.

However, in another study by Akbarizadeh *et al.* (2016), in a survey of knowledge about and perceived barriers to PC screening among medical staff, observed that perceived affordability was not statistically significant determinant of uptake of PC screening.

The above results agreed with those of Mwena (2015), in another study who demonstrated that there was no significant association between perceived affordability for men above 40 years and uptake of PC screening in Central Provincial Hospital. According to Kangmennang *et al.* (2016), in a study about what prevents men aged 40 - 64 from PC screening in Namibia. Those with affordable insurance schemes were five times more likely to go for the PC screening test compared to those who had no money.

Furthermore, in a cross-sectional study that was undertaken by Roth *et al.* (2016), concerning economies of PC screening strategies, found out that the cost of testing prevented men from accessing screening services. Those who were poor could not afford the test and therefore missed, the study concluded.

Client Satisfaction and Uptake of PC Screening Services

In a study by Heynes *et al.* (2013), about what prevents men aged 40 - 64 from PC screening in South Africa, client satisfaction, had a big impact on their uptake of PC screening. Men aged 40 years and above who were not satisfied by the services would not go for the screening tests.

The findings in the study above were similar to those in a study done in Uganda by Nakandi *et al.* (2013), about PC screening: knowledge, attitudes and practices, where the observations made indicated that non-satisfied clients about the services provided would still not go for PC screening.

In the same vein, the findings by Prostate Cancer Foundation (2012) in Australia in a research awareness and support, a ten-year progress in PC indicated that satisfied clients about the cancer screening services would improve PC screening among men aged 40 years and above.

Privacy Issues and Uptake of PC Screening

According to the study by Deon *et al.* (2016), in Nigeria on facilitators to uptake of PC screening, indicated that providing privacy to men who could come at the facility for PC screening would ensure that men felt secure and therefore could easily attract them and consequently improve the uptake of cancer screening. In hospitals were privacy was ensured during PC screening, men were seven times more likely to screen for PC compared to those health facilities without privacy.

The findings of the two studies in India suggest that PC screening program cannot successfully be implemented without the willingness and cooperation of the health

professionals to have special private clinics (Sanjeev *et al.* 2012), Sharma & Chauhan (2010). It was concurred that for such services to be carried out health care workers to have correct attitude regarding privacy for men in PC screening.

Summary of Reviewed Literature and Identified Research Gaps

The literature reviewed covered the concepts of the independent variable**s** which were the individual characteristics such as; age, education level, religion, marital status, occupation, cultural beliefs, awareness of the consequences of prostate cancer, knowledge levels on PC screening and perceived self-vulnerability; health system factors such as; attitude of health workers, Perceived Affordability, Client satisfaction and privacy issues and the dependent variable; uptake of PC screening with the associated literature gaps as well as some contradictions.

Several studies have been done outside the African context given the different environmental, cultural and socio-economic backgrounds. These include those done by for example, Breen (2001) in the United States of America and Maina in India. Others have been done in Africa for example by Lubega *et al. (*2010), in Iganga and Sylvester *et al.* (2015) in Tanzania. These studies give different findings on how the individual characteristics and health system factors influence an individual's decision to seek PC screening services.

Some of the studies were done about five years ago, with different methods. Given the advancement in technology and research methods, a lot has changed regarding the factors influencing uptake of PC screening. Different research designs of either quantitative or qualitative methods were used but there is need to triangulate both the qualitative and quantitative approaches to get the best results. It is evident that the

predictors of PC screening among men aged 40yeas and above in Uganda have not been adequately addressed in Uganda, which leaves the researcher with many unanswered questions creating a gap which needs to be addressed. This study thus sought to fill the gap by looking at the individual characteristics and health care system factors influencing uptake of PC among men aged 40years and above using both questionnaires and the Key Informants Interview Guide (KIIG) to identify the possible factors in Mukono Municipality, Uganda.

CHAPTER THREE

METHODOLOGY

This chapter explains the procedure that was applied in conducting the study to achieve the set objectives. It covered the research design, locale of the study, population of the study, sample size, sampling procedure, research instruments, methods of assessing validity and reliability of the instrument, ethical considerations data collection and analysis and procedures

Research Design

The study employed a cross sectional and correlational design with both quantitative and qualitative methods. The descriptive research design helped in describing the phenomena, that is; the individual characteristics and health care system factors. The study was Cross sectional because it was carried at one point in time from various sample elements in the population. This was employed because it gives actual information required at that moment in time. It saves time and other resources and current information is obtained as the trends and information are measured there and then. Correlational research design was concerned with explaining the influence of individual characteristics and health care system factors on uptake of PC screening among men aged 40years and above in Mukono Municipality. The quantitative approach was used to analyse the responses of participants in the questionnaires, while the qualitative approach was used to analyse information generated from the Key informant interviews conducted for selected health workers.The triangulation of the research designs in the study aimed at

improving the quality of the findings since no single research design could be effective in the study.

Locale of the Study

This study was conducted in Mukono Municipality, Uganda. The Municipality's headquarters are 20kms away from the capital city, Kampala, about 1km off the Kampala- Jinja high way with a population of about 161,993 people with 54% (females) and 46% (males). It is made up of 2 divisions namely; Goma and Mukono Central, with a total population of 161,996 people. Goma division has a population of about 91,768 people, of whom 43,142 are males while 48,626 are females and is sub-divided into 5 parishes/wards and 37 villages/cells (NHPC, 2014). Mukono Central division has a population of about 70,228 people, of whom 32,072 are males while 38,156 are females and is sub-divided into 4 parishes/wards and 40 villages/cells (NHPC, 2014). The average household size in Mukono Municipal Council is 4 people (National Housing and Population Census [NHPC], projection 2017. Mukono district boarders with the districts of Wakiso, Kayunga, Buikwe and Buvuma.

This Municipality was selected because only 10% of men aged 40years and above (Mukono District Health Sector Annual performance report, 2017) go for prostate cancer screening, even when these services are made readily available at no cost by some of the Implementing Partners (IPs) during the delivery of integrated health care services in the community, as compared to other municipalities in Uganda. This situation is worse compared to other municipalities in the country.

Study Population

The population of the study was 385 adult males in Mukono Municipality, aged 40 years and above who met the inclusion criteria. This population was selected because the age of 40 years and above has been reported as the age at risk for PC (Kemri, 2006). The age at risk for PC in Mukono Municipality is unknown. These men were selected at households without screening whether or not they had taken a prostate cancer screening test or had been diagnosed with prostate cancer before. Therefore, no research has been done among this target group in Mukono Municipality despite the 5.2% annual increase in PC cases among Ugandan men aged 40years and above and yet the majority of men do not like to go for routine screening for PC at the health facilities (Uganda Cancer Institute, 2016)

As part of the inclusion criteria, mentally sound men aged 40years and above that had resided in Mukono Municipality for 6months; based on previous studies, prior to the time of data collection and willing to consent were included in the study. As part of the exclusion criteria, mentally unsound men aged 40years and above that had resided in Mukono Municipality for less than 6months prior to the time of data collection and not willing to consent were included from the study.

Sample Size

The sample size of the study was 385 men aged 40years and above in Mukono Municipality as respondents, taken to be the appropriate sample size to answer whether there is or there is no significant influence of individual characteristics and health care system factors on uptake of PC screening among men aged 40years and above in Mukono

municipality, Uganda because smaller sample sizes are not reliable enough to answer a given research hypothesis or question (Amin, 2005).

The sample size for the quantitative study was arrived at using the standard formula (Kish Leslie, 1965) for unknown populations as given below;

$$N_o = \frac{Z^2 pq}{e^2}$$

Where;

- n_o = Sample size
- e = Level of precision of the study (precision of error of 5% was used)
- z = standard deviation corresponding to 95% confidence interval which is 1.96
- P= proportion of the respondents; men aged 40years and above estimated to uptake prostate cancer screening was assumed to be 50% since this would provide the maximum sample size was be taken to be 50%
- Q = (1-P) = 1- 0.5 = 0.5
- Thus, $N_o = (1.96^2 * 0.5 * 0.5) / (0.05 \times 0.05)$

  $= 0.9604/0.0025$

  $= 385$

Hence, the minimum number of aged 40years and above to give this study sufficient power is 385. The sample was chosen considering that 50% of men aged 40years and above take up PC screening and considering 95% level of confidence, the sample calculated was 385 respondents

For the qualitative approach, five key informants including a Medical Officer, Laboratory technicians, Clinical officer and a Nurse at Mukono HC IV and Mukono

International Medical Centre, were interviewed as these were sufficient to achieve data saturation. They were purposively selected because of their expert knowledge on prostate cancer and PC screening services in Mukono Municipality, Uganda.

Sampling Procedure

The study employed both purposive and simple random sampling strategies to identify respondents for the interviews. According to the Uganda National Bureau of statistics, UBOS (2014) census report, Mukono had four enumeration areas (EAs) comprised of four wards with 25 villages as indicated in Table 1 and each EA consisted of between 100 to 120 households. Within each cell are Village Health Teams (VHTs), who guided the research assistants to purposively identify homes of the respondents aged 40 years and above using household data on family members collected during the 2017 national Long-Lasting Insecticide treated mosquito net (LLITN) distribution campaign on malaria prevention. The household data had also been updated by the VHTs during other integrated programs.

Table 1: Administrative units of Mukono Municipality and Villages sampled in the study

Division	Parish/Ward	Village/ Cell	Number of Males	%age of males	No. of HHs sampled
Central	Namumira Anthony				
		Kitega	1342	5	20
		Kigombya	714	3	11
		Namumira	667	3	10
		Nsuube A	421	2	6
	Ntawo	Mulago	312	1	5
		Butebe	415	2	6
		Nasuuti	1250	5	19
		Nakabago	973	4	15
	Nsuube-Kauga	Nabuti	502	2	8
		Upper Nabuti	498	2	8
		Bugujju	312	1	5
	Ggulu	Ngandu	415	2	6
		Hamu Mukasa	678	3	10
		Kasangalabi	712	3	11
		Kitete	1234	5	19
Goma	Nantabulirwa	Nantabulirwa	2664	11	41
	Seeta	Gwafu	2653	10	40
		Gongobe	1930	8	29
	Misindye	Joggo	1100	4	17
		Goma-Misindye	1815	7	28
	Nyenje.	Nyenje	859	3	13
		Kigunga.	1632	6	25
	Bukerere	Bukerere	1231	5	19
		Nyanja	421	2	6
		Kyesereka	558	2	8
Total			**25308**	**100**	**385**

The lottery method was used to sample the required number of households per village. All interviews were conducted within households using the researcher administered questionnaires. A courtesy call was paid to the LC1's home upon which the

research assistants then walked directly to the sampled households for administering the questionnaires.

Within each household, the birth day rule was used for selecting the eligible respondent(s). In cases with absentee household members, the research assistant made an appointment with the respondent and scheduled the interview. The purposive sampling was used to select the key informants. The Key Informant interviews were purposively conducted to get more in-depth information on the reasons for the low uptake of PC screening, especially those variables that had not been fully addressed by the respondents during the time of administration of the questionnaires.

Research Instruments

In the study, two instruments were employed. They included questionnaires and a Key Informant Interview Guide (KIIG). Triangulation of the two study instruments was employed, where analyzed data was thematically incorporated within the corresponding qualitative and quantitative data to allow the researcher draw clear conclusions using related responses.

Questionnaire

Data was collected using a researcher-administered structured questionnaire. The questionnaire consisted of closed ended questions which were drawn from the objectives of the study. The questionnaire was chosen because it is the most appropriate tool for collecting large amounts of information from a large population in a short period of time and is relatively cost effective.

The questionnaire covered the variables in the conceptual framework and contained a section on the introductory part where the researcher introduced himself to

the respondents and explained the purpose of the study. This was followed by sections on the individual characteristics, health systems factors and uptake of prostate cancer screening among men aged 40 years and above in Mukono Municipality

Key Informant Interview Guide (KIIG)

The KIIG was used with the Senior Medical Officer, Medical Officer, Laboratory technician, and a Nurse at Mukono HC IV and a laboratory technician at Mukono International Medical Center (IMC) as the key informants on the account of their knowledge and experience in prostate cancer screening.

The KIIG had open ended and unstructured questions to help the key informants give both broad and in-depth views about the uptake of prostate cancer screening. This took about 30 minutes. The questions in the KIIG explored what the key informant knew about Prostate Cancer screening and its importance, awareness efforts undertaken as a health facility to sensitize men on the importance of PC screening, health care system related factors that hinder men from screening for prostate cancer and the health facility plans to reach out to the men aged 40years and above that have not screened for Prostate cancer.

In the study, a face to face interview with Key Informants was preferred, since it allowed the researcher to probe some of the open-ended questions that required in-depth qualitative information as backup to the statistical information that was generated during structured interviews.

Validity and Reliability

Before data collection the research instruments were pre-tested to determine suitability and appropriateness to ensure clarity and relevancy of data collection instruments. This is very important to measure the consistency of the instruments being used, to be in position to produce the same results if research is done elsewhere or by another person. The research instrument was pretested to determine the suitability, appropriateness to ensure clarity and relevancy of the data collection instrument.

Validity

Validity refers to the extent to which a measurement procedure measures what it is intended to measure rather than measuring something else, or nothing at all (Amin, 2005). In-order to ensure this the researcher collected data according to the objectives to address all variables. To ensure validity, the research instrument was given to three supervisors who proofread and checked the relevance of each question in providing answers to the study objectives and appropriate modifications were made. After which, a content validity index C.V.I was computed using the formula;

$$C.V.I = \frac{\text{Number of relevant items in the instrument}}{\text{Total number of items in the questionnaire}} = 21/22$$

After compilation, the instrument was considered valid because the CVI was 0.955, that is, greater than 0.6, as recommended by Amin (2005).

Reliability

Berbie, (2007), defines reliability as a tool of measurement method, which suggests the same data collected each time in repeated observations of the same

population. While Amin, (2005) says, reliability of an instrument is the consistence to measure what an instrument intends to measure. A pilot study was done on five respondents in the selected villages among men aged 40years and above in Mukono municipality. This aimed at obtaining responses that were similar to those expected from the participants in the final study. They were asked whether they clearly understood and were comfortable with the questions. Thereafter, changes in the question phrasing were done. The key informant interview guide was also pre- tested to see if the information was well understood by the key informants

Data Collection Procedure

An introductory letter from the Dean of Graduate Studies, Bugema University introduced the researcher to the Institutional Review Board (IRB) of TASO which upon review and some protocol amendments gave ethical approval to proceed for data collection. Due consideration was made to ensure that the protocol undergoes ethics review and approval in-order to satisfy the requirements for research involving humans as participants. Upon approval, the researcher proceeded to the Principal Medical Officer of Mukono Municipality, to whom the purpose of the study was succinctly explained.

After an acceptance stamp and signature (permission) was granted by the principal Medical Officer of Mukono municipality, the researcher trained three research assistants on the study protocol, data collection techniques, establishing rapport with study participants, accurate recording of data and use of various research tools. The research assistants were adequately briefed on the content of the questionnaire especially the main objectives of the study and emphasized confidentiality of the responses given by the respondents in accordance to the principles of anonymity. The research assistants

worked under direct supervision of the researcher on a daily basis. All participants received prior explanation on the purpose of the study before obtaining a written informed consent and were assured of confidentiality and anonymity, as per the Good Clinical Research Practice (GCP) principles. They were later given the researcher-administered, structured questionnaire. The study respondents were given time to go through the instructions or read for themselves and ask questions where they needed clarification. This enabled the researcher to explain the contents of the instrument and clarify any ambiguities that raised by the respondents. The researcher and his assistants cross checked the questionnaires for inconsistencies and omissions on a daily basis for completeness and quality assurance purposes before parting company with the respondent.

The study employed both quantitative and qualitative data with the use of researcher administered semi-structured questionnaire and KIIG. Written and verbal consent obtained from the respondents after explaining the objectives of the study. Confidentiality of information obtained from the respondents was ensured and study codes were used instead of names. Face to face interviews were used to obtain information from five key informants (Medical Officers, laboratory staff and Nurses) because it allowed the researcher to probe further, and it also required in-depth qualitative information as back up to the statistical information that was generated with the structured questionnaires.

Data Analysis

Following data collection, quantitative raw data obtained using questionnaire was sorted, edited, cleaned and entered into computer and analyzed using Statistical Packages

for Social Scientists (SPSS) version 20. Both descriptive and inferential statistical methods were used. The unit of analysis was the men aged 40 years and above participating in the study.

For objectives; one, two, and three, descriptive analysis was done to generate frequencies, percentages, means, standard deviations then presented in tables and pie charts. Objective four, was analyzed using Chi-square (χ^2) technique. Factors that were significant were then subjected to Logistic regression to derive Crude Odds Ratios (COR) and corresponding 95% Confidence Intervals (CI) to establish the direction of the relationship between the factors and uptake of PC screening. The significant variables in Logistic regression analysis were later subjected to multivariate analysis to derive Adjusted Odds Ratios (AOR) and corresponding 95% CI.

To test for hypothesis, significant levels or p= 0.05 was used. For p-values less than 0.05, the findings were taken as statistically significant. For P-values greater than 0.05, it meant that the findings were not statistically significant. Qualitative data from the Key Informants was captured during the Key Informant interviews, interpreted and added in the discussion of the results of the study.

CHAPTER FOUR

RESULTS AND DISCUSSION

This Chapter covers results and discussions. The findings are arranged as per the specific objectives of the study and were used to answer the research questions from which the study objectives were formulated. Results were critically analyzed, interpreted and discussed. The qualitative study findings from the respondents and key informant interviews were also included in the discussion to give the in-depth and informed conclusion of the study. The discussion of the study results was done while comparing with findings from previous and recent related literature. A total of 385 men aged 40years and above in Mukono Municipality, Uganda who met the inclusion criteria, and who consented to participate in the study were recruited. All the eligible study participants 385 (100%) as per the calculated sample size were questionnaires were interviewed and data collected was cleaned before analysis

Individual Characteristics of the Respondents in the Study

Objective 1 of the study intended to find out the individual characteristics of men aged 40years and above in Mukono Municipality that influence uptake of PC screening. These characteristics included; age, education level, marital status, religion, occupation, income levels, cultural beliefs, awareness of consequences of prostate cancer, knowledge levels on prostate cancer screening and perceived self-vulnerability. Data obtained was analyzed using descriptive statistics to generate frequencies, percentages, mean and standard deviation to describe the individual characteristics of men aged 40years and above in Mukono municipality. The findings are summarized in Table 1.

Table 2: Individual Characteristics of Respondents in the study

Characteristics	Frequency (n=385)	Percent
Age group		
40 – 45yrs	75	19.5
46 - 50yrs	137	35.6
51 - 55yrs	71	18.4
56 +yrs	102	26.5
Education background		
Never been to school	28	7.3
Primary (P1 – P7 level)	112	29.1
Secondary level (S1 – S6)	150	39.0
Post-secondary education	95	24.7
Marital status		
Never married	10	2.6
Married /cohabiting	308	80.0
Divorced /separated	42	10.9
Widowed	25	6.5
Religion		
Catholic	108	28.1
Protestant	144	37.4
Seventh Day Adventist	34	8.8
Muslim	62	16.1
Pentecostal	30	7.8
Others	7	1.8
Occupation		
Informal Employment	294	76.4
Formal Employment	91	23.6
Average Household Income (Ugx)		
Less than 30,000	23	6.0
30,000 - 200,000	92	23.9
200,001 - 500,000	124	32.2
500,001 - 1,000,000	130	33.8
More than 1,000,000	16	4.2
Cultural Beliefs		
Strongly believe in them	5	1.3
Believe in them	15	3.9
Don't believe in them at all	232	60.3
Knowledge levels on PC screening		
Yes	176	45.7
No	209	54.3
Awareness of the Consequences		
Yes	197	51.2
No	188	48.8
Self-vulnerability		
Yes	115	29.9
No	132	34.3
Not sure	138	35.8

Age of the Respondent

Results in Table 2 show that the majority 283 (73.5%) of the respondents were below 55 years of age and a few 102 (26.5%) were above 56 years. The findings suggest that the respondents in the study were relatively young and this could be attributed to the young age of the Ugandan population in accordance to the report from the NHPC (2014) which showed that the majority of men in Mukono Municipality are below 59years of age. This was supported by one of the Key informants, the Medical Officer at Mukono HC IV as he said;

> *"All the prostate cancer deaths recorded at this health center involve men above 40years of age. In the financial year 2016/2018, we registered a total of about six prostate cancer cases that we referred to the Uganda Cancer Institute for further management but all these were men above 40years of age''* (KI1, 2018)

This indicated that the majority of prostate cancer cases involve men aged 40years and above who are very useful sources of information and knowledge to the communities. Once PC is not detected early through routine screening programs, the death of such men may have a negative impact on the social and economic developments of the country.

These findings disagreed with those from the study done by Graham *et al.* (2017) about the uptake of prostate cancer screening in a medical review, which revealed that old men above 60years were six times more likely to screen compared to the young ones

Education Level

Table 2 results showed that the majority 262 (68%) of the respondents had attained primary and secondary level education, while few 95 (24.7%) had post-

secondary education. Very few of the respondents 28 (7%) had never been to school. These findings agreed with those from the NHPC (2014) which showed that only 6.5% of males aged 18years and above in Mukono Municipality are illiterate. This finding could be attributed to the national Universal Primary and Secondary Education programs through which more Ugandans have accessed free education. This might have an implication on uptake of PC screening since knowledge acquired through various communication channels such as the print media is required for the individual to make a decision to go for PC screening.

However, a study conducted in Ethiopia by Mwaniki, (2015) revealed that uptake of PC screening was insignificantly different among those with low, no or high education.

Marital Status

Table 2 results showed that majority 308 (80%), of the respondents were married or living together, while very few 10 (2.6%) were never married. The large number of married respondents could be attributed to the age since the study targeted men aged 40years and above; the age by which most of the men are expected to be married. This is supported by the NHPC (2014), which showed that 57.2% of people above 18years living in Mukono Municipality were married. Marriage is very important in the provision of companionship and social support to take up certain behavioral practices such as going for prostate cancer screening.

Religion

As indicated in Table 2, majority 316 (82%) of the respondents were Christians, dominated by Protestants 144 (37%) followed by Catholics 108 (28%). The Muslims 62 (16%), Seventh Day Adventists 34 (8.8%), Pentecostals 30 (7.8%) and other religious affiliations (2.4%) were the least reported. Men are likely to either go for prostate cancer screening or not based on their religious beliefs as one of the key informant; a health worker from Mukono HC IV, mentioned;

> '*We need to bring the churches and mosques on board if we are to improve uptake of prostate cancer screening. I say this because these preachers have a lot of influence on many decisions that their followers make' (KI2, 2018)*

This is because Christianity is the dominant faith in Mukono district as reflected in NPHC (2014) for religion distribution in Mukono district. Religion greatly impacts on an individual's lifestyle and key decisions that affect one's behaviour.

This indicated that religion has a great implication on the uptake of PC screening among men aged 40years and above since the followers tend to just believe without questioning what is being preached or promoted by their leaders.

Occupation

Results from Table 2 show that majority 294 (76%) of the respondents indicated that they were informally employed. This is attributed to the level of education where few respondents 95 (24.7%) reported to have post-secondary education and were therefore less likely to take up the "*white-collar"* jobs. A report from the NPHC (2014) indicated that 67.9% of persons aged 18years and above living in Mukono Municipality

were working but did not differentiate between those in the formal and informal sectors. Occupation is a key factor in the uptake of PC screening because it creates social networks and the nature of an individual's employment determines their ability to meet the PC screening related costs. This finding is in agreement with those of Maina *et al.* (2013), which revealed that the job one was doing did matter about the level of uptake.

Income Levels

Table 2 shows that less than half 146 (38%) of the respondents reported earning more than 500,000/= per month. This could be because the majority 294 (76%) of the respondents reported being informally employed with few 95 (24.7%) having post-secondary education. An individual's income is important because it predicts the affordability for PC screening services, especially at private health facilities where these services are provided at a cost and this is a key determinant of one's decision to go for PC screening as one of the key informant; health worker at Mukono HC IV stated;

> "*The challenge we are having is that of poverty where many men, especially those deep in the rural areas who are not receiving any incomes find it difficult to go to health facilities to access PC screening services. Sometimes even transport costs are a challenge*" (KI4, 2018)

Cultural Beliefs

In this study, the cultural beliefs explored included; undressing for medical examinations, receiving injections or medications. Respondents in the study were asked whether they believed in such beliefs or not. Findings indicate that the majority 232 (60%) of the respondents reported that they do not believe in such cultural beliefs and very few 5 (1%) strongly believed in such cultural beliefs.

However, these findings disagree with those of Vrijheid *et al.* (2009), from a study done in India which concluded that cultural beliefs had a strong influence on PC screening.

Knowledge Levels on PC Screening

In this study, knowledge referred to whether the respondent had information on prostate cancer and the importance of screening for prostate cancer. The study inquired their levels of knowledge on PC screening. The results in table 1 show that slightly more than half 209 (54%) of the respondents reported that they did not have knowledge in PC screening. This suggested that the respondents fairly had knowledge on PC screening. Knowledge on PC and its screening is very important because it forms a basis for an individual to make a decision to go for PC screening. When a man is empowered with information on the cause, symptoms and signs of Prostate cancer and the importance of PC screening, he is more likely to go for PC screening.

These results agreed with those from the interviews held during which all the five Key informants agreed that lack of knowledge on PC screening among men and some of the health workers was a major obstacle that hinders uptake of PC screening as mentioned below by a key informant, a health worker at Mukono International Medical Centre;

> *"There is little knowledge among men and even some of the health workers on prostate cancer and its screening methods. It is surprising that majority of health workers at this health center do not know about PC screening. Therefore, we have planned to conduct CMEs on this topic so that we begin by closing the knowledge gap among health workers on PC screening. The majority of the health workers are more familiar with Cervical Cancer screening but not Prostate cancer screening" (KI5, 2018)*

These findings are similar to those from a study done by Kangmennang *et al.* (2016), which concluded that those with knowledge on PC screening are more likely to go for PC screening compared to those who did not have knowledge

Awareness of the Consequences of Prostate Cancer

Respondents in the study were asked whether they were aware that prostate cancer is a serious disease with consequences such as blockage of the urinary tract and genital system, including death. Results in Table 2 show that slightly more than half 197 (51.2%) of the respondents were aware of the consequences of Prostate cancer while 188 (48.8%) were not aware. The number of respondents who were aware of PC screening was relatively high due to the numerous sensitization efforts on the importance of PC screening among men at risk of the disease, through radio talk shows and other integrated community outreach programs supported by the Mukono district health office, Rotary community hospital, and many other implementing partners within Mukono district. Many awareness efforts on PC screening have also been created through many media platforms such as newspapers, radios, television, among others. The Ministry of Health through its department for the Non-communicable disease (NCD) control has emphasized the dissemination of information to the public on the increasing burden of non-communicable diseases in the country. A prostate cancer awareness month which is organized once every year also increases public awareness levels on PC screening

These results are similar to those from a study done by Ojewola *et al.* (2017), about influence of attitudes on uptake of PC screening which concluded that awareness of consequences had a significant impact on men screening for prostate cancer.

Perceived Self-vulnerability

In this study, respondents were asked whether they were aware of their individual risk of developing prostate cancer. Table 1 shows that few 115 (30%) of the respondents reported that they were at risk of developing Prostate cancer. However, 138 (35.8%) of the respondents reported that they were not sure whether they were at risk of developing prostate cancer or not. These results are in agreement with those from the key informants where it was noted that awereness levels of self-vulnerability on PC screening are still low among men at risk of developing the disease as stated below, by the key informant (health worker) at Mukono HC IV.

"*Despite the various sensitization efforts, majority of the men are still not aware of this deadly disease. We need to use other channels to disseminate messages and create more awareness on Prostate cancer screening"* (KI5, 2018)

According to the Health Belief Model of Rosenstock (1974), individual perceptions of self-vulnerability facilitates one's decision to go for screening services in fear of complications of the disease. When a man is aware of his personal risk to develop prostate cancer, the fear of the complications of the disease; including death, is likely to facilitate his decision to go for prostate cancer screening.

These findings however, differ from those of the study done by Wong *et al.* (2017), in systematic review qualitative studies about men's perspective and uptake of PC screening which showed that self-vulnerability was not a statistically significant determinant of uptake of PC screening

Influence of Health Care System Factors on Uptake of Prostate Cancer Screening

Objective 2 of the study intended to assess the health care system factors that influence uptake of PC screening among men aged 40years and above in Mukono municipality. These included; attitude of health workers, perceived affordability, client satisfaction and privacy issues. Out of the 385 respondents, only 29 reported having ever been screened for prostate cancer as summarized in Table 3.

Table 3: Health Care System Factors and uptake of prostate cancer screening

Factors	Frequency (n=29)	Percent
Attitude of Health workers		
Positive	25	86.2
Negative	4	13.8
Perceived Affordability		
Affordable	20	69
Not affordable	9	31
Client satisfaction		
Yes	23	88
No	3	11.5
Lack of Privacy		
Yes	7	23.3
No	23	76.7

Attitude of Health workers;

Table 3 shows that majority 25 (86%) of the respondents that had ever been screened for PC reported that health workers were friendly and supportive during the time of screening while only 4 (13.8%) reported lack of adequate support from the health workers at the time of screening. This is probably due to the suggestion box at the outpatient department, where clients' views about the quality of services offered and the attitude of health workers are placed. Client exit interviews are also done to capture feedback from the clients regarding their experience at the time of accessing health care services. The finding revealed that most men were satisfied and happy with the way the

health workers handled them at the time of screening for Prostate cancer. These findings were similar to those from the Prostate Cancer Foundation (2012), in Australia which indicated that health workers had good attitudes and relationships that improved PC screening among men aged 40years and above.

However, these findings were different from those in a study done by Nakandi *et al.* (2013), about PC screening: Knowledge, attitudes and practices among Ugandan men which revealed that health workers had negative attitudes that negatively impacted on PC screening.

Perceived Affordability;

Results in Table 3 show that majority of the respondents 20 (69%) indicated that the cost of screening for PC was affordable. However, 9 (31%) of the respondents reported that they were able to pay for the PC screening services but with major difficulties. The majority of the respondents could afford the cost for PC screening because they are living in an urban setting and involved in various business enterprises. Some of the respondents could not afford to pay for the PC screening services because they are unemployed. These findings are similar to those from a study undertaken by Bloom *et al.* (2006), about family history, perceived affordability and uptake of PC screening had significant influence on uptake of PC screening

However, these findings differ from the study done by Mwena (2015), which demonstrated that there was no significant association between perceived affordability and uptake of PC screening

Client satisfaction

During the study, clients who had ever been screened for PC were asked whether they would recommend a friend to go for screening at the same health facility. Table 3 shows that majority 23 (76.6%) of the respondents reported having been satisfied with the quality of services received during prostate cancer screening and would therefore recommend their friends to screen for PC from the same health facility. Client satisfaction is an important factor for uptake of PC screening because a client who has received quality services is more likely to recommend another for uptake of PC screening services at the same health facility.

These results are similar to those from the study done by Heynes *et al.* (2013), about what prevents men aged 40 – 64 years of age from going for PC screening services. The study found out that client satisfaction had a great impact on the uptake of PC screening. Men aged 40years and above who were not satisfied by the quality of the services would neither go, nor recommend their peers for PC screening

Privacy issues;

Table 3 shows that majority 23 (76.7%) of the respondents who had ever been screened for PC reported no embarrassment or lack of privacy at the health facilities at the time of screening for prostate cancer. However, 7 (23.3%) of the respondents reported embarrassment and lack of privacy at the time of screening for Prostate cancer. Privacy at the time of receiving a PC screening service is very important especially when the Digital Rectal Examination (DRE); a procedure that requires exposure of a man's urogenital system, is to be performed. If this is not ensured, a man is likely to get embarrassed and may never screen again or recommend a friend to screen for Prostate cancer. Privacy was

ensured among the majority of the respondents probably because the health care providers had been trained on how to ensure privacy while conducting such sensitive procedures and the availability of adequate or improvised space for PC screening

These findings agree with those from a study done by Deon *et al*. (2016), in Nigeria about facilitators to uptake of PC screening which concluded that health facilities where privacy was provided to men at the time of screening were seven times more likely to screen men for PC compared to those where privacy was not ensured.

Uptake of Prostate Cancer Screening

Objective 3 of the study sought to determine the uptake level of PC screening among men aged 40years and above in Mukono Municipality. Descriptive statistics were used to generate frequencies, percentages, pie-charts, mean and standard deviation to describe uptake of PC screening. Results in Figure 4 indicate that there was very low uptake (8%) of prostate cancer screening among men aged 40years and above in Mukono Municipality. Study participants were asked whether they had ever been screened by any of the common PC screening methods such as serum Prostatic Surface Antigen (PSA) and Digital Rectal Examination (DRE). The majority 355 (92%) of respondents reported that they had never screened for PC, implying that the uptake of PC screening was extremely low.

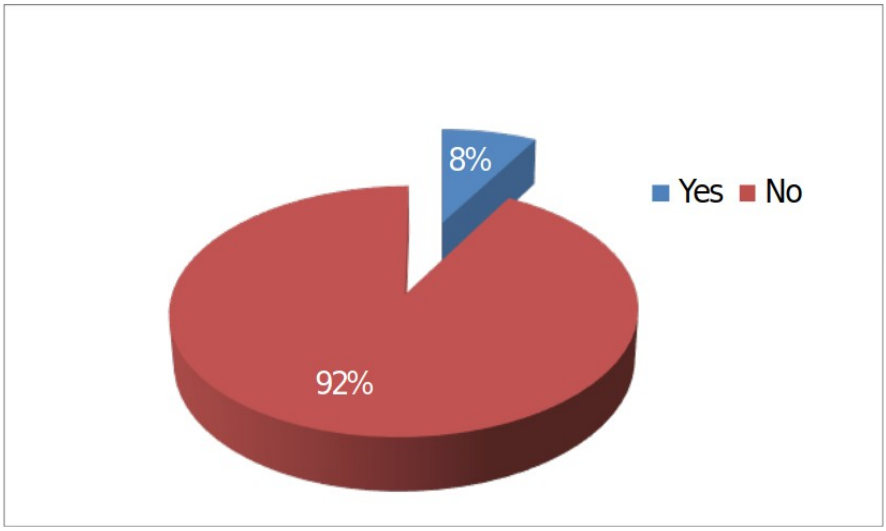

Figure 2: Uptake of Prostate Cancer Screening

The very low uptake of PC screening is probably due to the low levels of awareness and knowledge on prostate cancer and screening. Some of the respondents have financial constraints and cannot afford to pay for prostate cancer screening services especially at the PFP & PNFP health facilities where PC screening services are available at a cost. The uptake of PC screening could also be low due to lack of national guidelines on PC screening at health facilities, hence health workers are not well guided on PC screening.

In the open response questions, 385 respondents were asked the obstacles for PC screening out of whom 354 (92%) reported the obstacles summarized in Table 3, as the reasons that hinder men from screening for prostate cancer. Few 31 (8%) of the respondents did not mention any reason as to why men do not screen for Prostate cancer.

Table 4: Obstacles for PC Screening among Men Aged 40years and Above in Mukono Municipality, Uganda

Obstacle	Frequency (n=354)	Percent	Ranking
Lack of information on PC and its consequences	139	39.3	1
Financial challenges	67	18.9	2
Fear of being told that they have developed PC	33	9.3	3
Have no time to go for prostate cancer screening	16	4.5	4
Fear of the embarrassment of exposing their private parts	14	4.0	5
Some Church leaders tell them that God is able to heal them of all their diseases	11	3.1	6
Health workers are rude, have bad attitudes towards clients	11	3.1	7
Lack of PC screening services at nearby health facilities	9	2.5	8
It is for very old men (aged 65 years and above)	9	2.5	9
Long distances to health facilities	8	2.3	10
African men naturally don't like to test for diseases	8	2.3	11
Do not know where to screen for PC	7	2.0	12
In the absence of symptoms men think they are free from PC	6	1.7	13
Lack of supplies for PC screening in nearby health facilities	5	1.4	14
Fear of pain during prostate cancer screening	5	1.4	15
Long waiting times at health facilities	4	1.1	16
Belief in cultural norms that hinder them from PC screening	2	0.6	17
Total	**354**	**100**	

Results in Table 4 indicate that the majority 139 (39%) of respondents did not go for PC screening due to lack of information about PC and its consequences followed by 67 (18.9%) citing financial challenges as the reason for not screening for prostate cancer. Belief in cultural norms 2 (0.6%) and long client waiting times 4 (1%) were the least mentioned reasons why men aged 40years and above in Mukono Municipality do not go for PC screening

Further still, in the open response questions, 175 respondents who had indicated that they had information on pc screening were asked to state the source of the information they had received about PC screening. The findings are shown in Table 5

Table 5: Source of information about prostate cancer screening

Source of information	Frequency (n=175)	Percent	Ranking
Health workers	78	44.6	1
Media	69	39.4	2
Peers	28	16	3

As indicated in Table 5, majority 78 (44.6%) of the respondents heard about prostate cancer screening from health workers like doctors, nurses and health facility pharmacies, 69 (39%) from the media while few (16%) reported having heard of PC screening from peers such as friends and relatives. These findings are due to the high awareness levels on PC screening by sensitisation of the public through the various media platforms and at health facilities by health workers. The ministry of health, through its division of health education and health promotion has recently integrated messages on cancer prevention (including prostate cancer) in the ongoing programs following the epidemiological transition from the communicable to non-communicable disease burden

Influence of Individual Characteristics and Health Care System Factors on Uptake of Prostate Cancer Screening

Objective 4 of the study was to establish the influence of individual characteristics and health care system factors on uptake of PC screening among men aged 40years and above I in Mukono Municipality. To achieve this, the related factors were subjected to Pearson Chi square ($\chi^{2)}$ tests as in Table 6. Those variables which showed significant influences were subjected to Logistic regression to obtain Crude Odds Ratios (COR) and corresponding 95% Confidence Intervals (CI) as presented in Table 6. The significant variables after Logistic regression were further subjected to multivariate analysis to get the Adjusted Odds Ratios (AOR) and corresponding 95% CI. Table 5 shows the findings

from the bivariate analysis of Factors and Uptake of Prostate Cancer Screening among the Respondents in the study.

Table 6**: Bivariate Analysis of Factors and Uptake of Prostate Cancer Screening**

Variable	Uptake of PC Screening		X2	df	p-value
	Yes (n/%)	**No (n/%)**			
Age					
40 - 50	15 (7.1)	197 (92.9)	0.337	1	0.561
51 >	15 (8.7)	158 (91.3)			
Education Level					
Primary	7 (5.0)	133 (95.0)	2.387	1	0.122
Post-primary	23 (9.4)	222 (90.6)			
Marital status					
Married	27 (8.8)	281 (91.2)	2.033	1	0.154
Unmarried	3 (3.9)	74(96.1)			
Occupation					
Informal Employment	15 (5.1)	279 (94.9)	12.528	1	0.000**
Formal Employment	15 (16.5)	76 (83.5)			
Income Levels					
Less than 500,000/=	15 (6.3)	224 (93.7)	2.016	1	0.156
More than 500,0001/=	15 (10.3)	131 (89.7)			
Cultural Beliefs					
Believe in them	2 (10.0)	18 (90.0)	.143	1	0.705
Don't believe in them	28 (7.7)	337 (92.3)			
Awareness of the Consequences					
Yes	26 (13.2)	171 (86.8)	16.408	1	0.000**
No	4 (2.1)	184 (97.9)			
Knowledge levels on PC screening					
Yes	29 (16.5)	147 (83.5)	34.037	1	0.000**
No	1 (0.5)	208 (99.5)			
Self-vulnerability					
Yes	27 (23.5)	88 (76.5)	56.599	2	0.000**
No	0 (0.0)	132 (100.0)			
Not sure	3 (2.2)	135 (97.8)			
Attitude of health workers					
Positive e.g. friendly					
Negative e.g. rude					
Affordability			1.506	1	0.220
Affordable	17 (85.0)	3 (15.0)			
Not affordable	9 (100.0)	0 (0.0)			
Client Satisfaction					
Yes	23 (35.9)	41 (61.4)	4.953	1	0.026*
No	3 (100.0)	0 (0.0)			
Privacy Issues					
Yes	7 (100.0)	0 (0.0)	.652	1	0.419

No	21 (91.3)	2 (8.7)

At bivariate analysis, the individual characteristics and health system factors were analyzed using chi square analysis techniques. The factors namely; occupation, awareness of consequences of PC, knowledge on PC screening, self- vulnerability and client satisfaction that showed a P-value of <0.05, implying significance at the Chii square analysis level, were further analyzed in the logistic regression. Bivariate logistic regression was performed in order to generate crude odds, confidence intervals and associated P-values. Finally, a multivariate logistic regression was performed to generate adjusted odds, associated confidence intervals and P-values as shown in Table 7 Awareness of consequences of prostate cancer and knowledge on PC screening were the significant factors.

Table 7: Bivariate and Multivariate Logistic Regression Model

Variable	**Uptake of PC Screening**		**COR CI (95%)**	**AOR CI (95%)**
	Yes (n/%)	**No (n/%)**		
Occupation				
Informal Employment	15 (5.1)	279 (94.9)	**0.27 (0.127 – 0.582)***	0.35 (0.1552 – 0.382)
Formal Employment	15 (16.5)	76 (83.5)	1	1
Awareness of the Consequences				
Yes	26 (13.2)	171 (86.8)	**0.17 (0.073 – 0.406)***	**0.24 (0.078 – 0.747)***
No	4 (2.1)	184 (97.9)	1	1
Knowledge levels on PC screening				
Yes	29 (16.5)	147 (83.5)	**0.05 (0.013 – 0.225)***	**0.10 (0.022- 0.499)***
No	1 (0.5)	208 (99.5)	1	1
Age				
40- 50	15(7.1)	197(92.9)		
>51	15(8.7)	158(91.3)		

P<0.01, 0.05, RC =1

Occupation of Respondent

Results in Table 7 indicate that those in the informal sector are about four times less likely to go for PC screening compared to those in the formal sector. Occupation is a proxy to income levels and creates opportunities for social networks**.** Those who are in the informal sector are likely to earn less compared to those who are formally employed. This finding is in agreement with those from the study done in Khartoum by Asgad *et al*. (2014), where causal laborers could not afford the PC screening services. Controlling for awareness on PC screening and individual's knowledge on PC screening, the odds of PC screening in regards to occupation increase.

Awareness of the Consequences of Prostate Cancer

Those not aware of prostate cancer screening are about six times less likely to screen for PC compared to those who are aware of PC screening. Awareness on PC screening was significant due to the numerous sensitization efforts on the importance of PC screening among men at risk of the disease, through radio talk shows and other integrated community outreach programs supported by the Mukono district health office, Rotary community hospital, and many other implementing partners within Mukono district.

These findings are similar to those from a study done by Ojewola *et al.* (2017), about influence of attitudes on uptake of PC screening which concluded that awareness of consequences had a significant impact on men screening for prostate cancer.

Knowledge Levels on PC screening

Those without knowledge on PC screening are 20 times less likely to go for PC screening compared to those who have knowledge on PC screening. Knowledge on PC screening is very important because it forms a basis for an individual to make a decision to go for PC screening. When a man is empowered with information on the cause, symptoms and signs of PC and the importance of PC screening, he is more likely to go for PC screening.

These findings are similar to those from a study done by Kangmennang *et al.* (2016) which concluded that those with knowledge on PC screening are more likely to go for PC screening compared to those who did not have knowledge

Hypothesis Testing Analysis

According to the study findings, there was no significant influence between health care system factors and uptake of PC screening among men aged 40years and above in Mukono municipality, with $p > 0.05$); therefore, the null hypothesis of no significance was accepted. However, according to the study findings, there was a significant influence between individual characteristics and uptake of PC screening among men aged 40years and above in Mukono Municipality, with $p < 0.05$), thus, the null hypothesis of no significance was rejected. The null hypothesis allows the study to conclude that uptake of PC screening among men aged 40years and above in Mukono municipality is significantly influenced by individual characteristics.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter presents the summary of the study findings, conclusion and recommendation in relation to the study objectives.

Summary

This study was titled "Factors influencing uptake of prostate cancer screening among men aged 40years and above in Mukono municipality, Uganda." It was conducted between June and August 2018, with the following objectives;

1. To find out the individual characteristics that influence uptake of PC screening among men aged 40years and above in Mukono Municipality, Uganda
2. To assess the health care system factors that influence uptake of PC screening among men aged 40years and above in Mukono Municipality, Uganda.
3. To determine the level of uptake of PC screening among men aged 40years and above in Mukono Municipality, Uganda.
4. To establish whether there is a significant influence of individual characteristics and health system factors on uptake of PC screening among men aged 40years and above in Mukono Municipality, Uganda.

The study was descriptive, cross-sectional and conducted using mixed methods approaches, where 385 men aged 40years and above were interviewed using a researcher administered questionnaire and key informant interviews. Data analysis was done, quantitative raw data obtained using questionnaires was sorted, edited, coded and fed into the computer and analyzed using SPSS version 20. The data obtained was analyzed using

descriptive statistics for objectives One, Two and Three. For objective four, inferential statistics using chi-square (χ^2) technique and logistic regression was done.

Key Findings

The study found out that majority 283 (73.5%) of respondents who participated in the study were men aged 40-50 years, attained secondary as their highest level of education while a high number 308 (80%) of respondents were married and 294 (76%) informally employed. It was also established that majority 316 (82%) of respondents were Christians and 146 (38%) earned less than 500,000/= per month. Still, majority 232 (60%) of the respondents did not report any cultural beliefs that hinder them from screening for prostate cancer. The study found that uptake of PC screening among men aged 40years and above in Mukono municipality is very low (8%) which is almost similar to the Mukono District Health Sector Annual performance report (2017) which showed that only 10% of men aged 40years and above had screened for prostate cancer.

Bivariate logistic regression revealed that occupation status (formal/informal employment), lack of awareness on consequences of prostate cancer, knowledge levels on PC screening, perceived self-vulnerability and client satisfaction were significant factors influencing uptake of PC screening with $p < 0.05$. Subjected to multivariate logistic regression, lack of awareness on consequences of prostate cancer and knowledge levels on PC screening still remained significant factors ($p < 0.05$) for the uptake of PC screening in Mukono Municipality, Uganda.

Conclusions

The level of uptake of PC screening among men aged 40years and above in Mukono Municipality was extremely low. This implies that without appropriate interventions, the incidence, morbidity and mortality due to PC among men aged 40years and above in Mukono Municipality is likely to increase. This is because the majority of men are likely to present late with complications of PC due to the low awareness and knowledge levels on PC screening.

Awareness and knowledge on PC screening are key important individual factors in enhancing uptake of PC screening among men aged 40years and above in Mukono Municipality

Recommendations

Based on the key study findings and conclusions, the following recommendations are made;

Municipal, District Health Offices and Health Facilities

Based on the low levels of awareness and knowledge on PC screening, Mukono Municipality needs to identify and embrace strategic partnerships with other partners to create awareness and disseminate information for enhancing uptake of PC screening, including the rural areas. Opportunities such as integrated outreaches, health camps, markets, churches and mosques, public gatherings involving men at risk of developing PC, among other foras need to be embraced as avenues for enhancing community awareness and knowledge on PC screening.

There is need to bring women onboard in improving PC screening among men aged 40years and above. This is because of the critical influential role that women play in the lives of men.

Ministry of Health

Based on the low levels of awareness and knowledge on PC screening, the Ministry of Health at national and district levels should integrate messages on PC screening in other health promotion activities to enhance uptake of PC screening leading to ameliorating the burden of the disease in Uganda.

Areas For Further Studies

There is need to conduct further research employing qualitative studies for example, focus group discussions to obtain more in-depth findings from men aged 40years and above to underpin other determinants of the uptake of PC screening.

Expand prostate cancer research to other Ugandan Municipalities especially to identify the influence of other factors such as family history, genetics, lifestyle on PC screening that the scholar has not taken into account so as to formulate relevant and specific, targeted interventions for addressing the burden of PC in Uganda.

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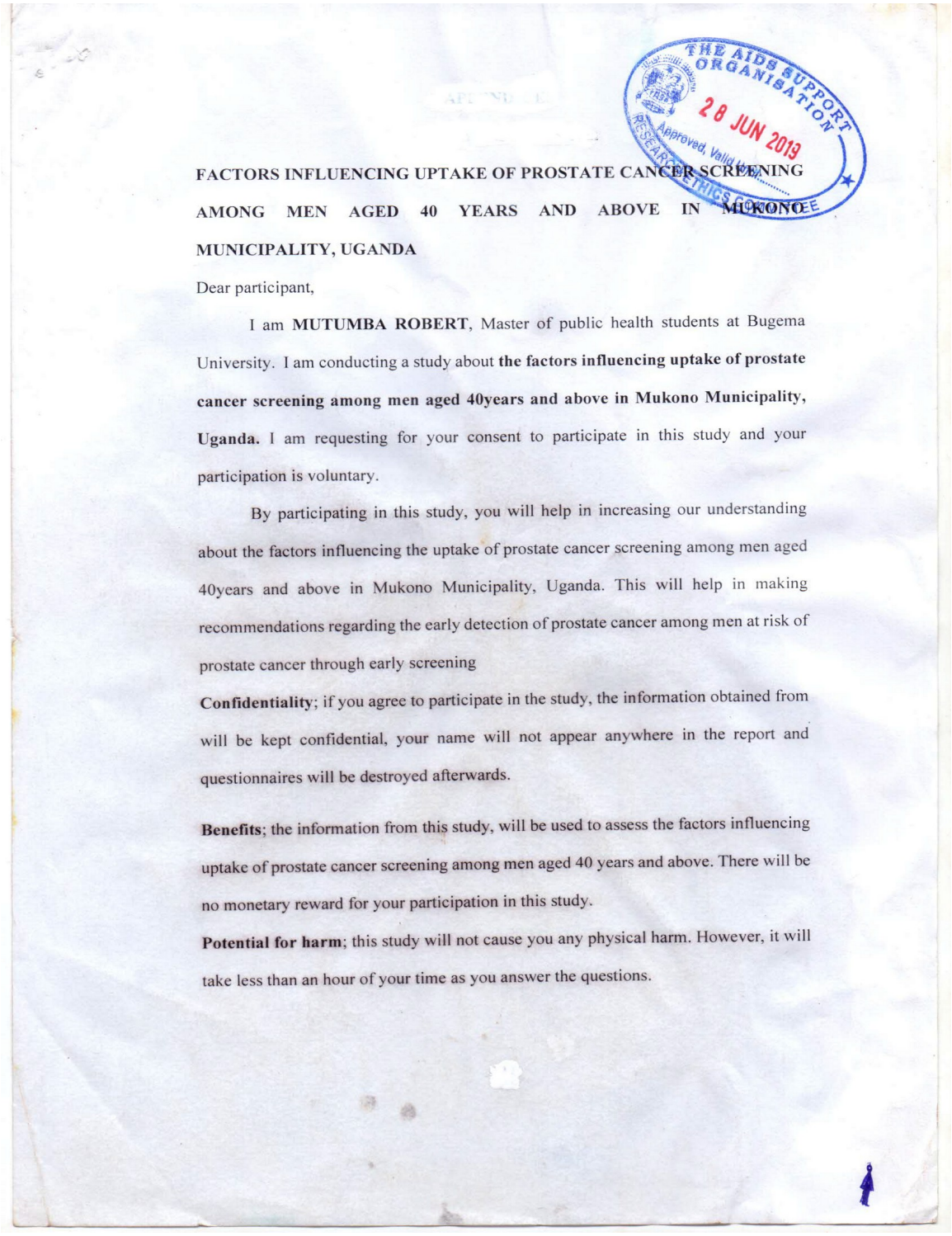
APPENDICES

Appendix I: Consent Form



FACTORS INFLUENCING UPTAKE OF PROSTATE CANCER SCREENING AMONG MEN AGED 40 YEARS AND ABOVE IN MUKONO MUNICIPALITY, UGANDA

Dear participant,

I am **MUTUMBA ROBERT**, Master of public health students at Bugema University. I am conducting a study about **the factors influencing uptake of prostate cancer screening among men aged 40years and above in Mukono Municipality, Uganda.** I am requesting for your consent to participate in this study and your participation is voluntary.

By participating in this study, you will help in increasing our understanding about the factors influencing the uptake of prostate cancer screening among men aged 40years and above in Mukono Municipality, Uganda. This will help in making recommendations regarding the early detection of prostate cancer among men at risk of prostate cancer through early screening

Confidentiality; if you agree to participate in the study, the information obtained from will be kept confidential, your name will not appear anywhere in the report and questionnaires will be destroyed afterwards.

Benefits; the information from this study, will be used to assess the factors influencing uptake of prostate cancer screening among men aged 40 years and above. There will be no monetary reward for your participation in this study.

Potential for harm; this study will not cause you any physical harm. However, it will take less than an hour of your time as you answer the questions.

Voluntary consent; you are free not to participate in this study and you have the right to refuse to answer any question that you feel uncomfortable with, without loss of benefit.

Incase of any questions regarding your rights and welfare during participation in the study, please feel free to contact Dr. Bogere Daniel on Tel. 0772139126 or 0705812960 for assistance.

By signing below, you indicate that you have understood the information presented to you concerning this study and you voluntarily give your consent to participate in the study

Signature of respondent..... Thumb print.....Date and time.....

Signature of witness (if any).....Thumb print..... Date and time.....

Signature of researcher..... Date and time.....

Appendix II: Consent Form for Luganda Version

Consent form for the Luganda Version

EKIWANDIIKO KY'OKUKKIRIZA OKWEETABA MU KUNOONYEREZA

OMUTWE GW'OKUNOONYEREZA: ENSONGA EZISOBOZESA OBA EZIREMESA ABASAJJA ABAWEZA EMYAKA 40 N'OKUGENDA WAGGULU ABABEERA MU MUNISIPAALI EY'EMUKONO, UGANDA OKUJJUMBIRA OKWEKEBEZA KOOKOLO ALEETERA ABASAJJA OKUZIBIKIRA ENSEKE

Ssebo,

Ennyanjula: Amannya gange nze, MUTUMBA ROBERT, ndi muyizzi mu ttendekero lya Yunivaasite y'eBugema nga nsoma diguli ekwata ku kukuguka mu by'obulamu bw'abantu. Ndi mu kunoonyereza ku nsonga ezisobozesa oba eziremesa abasajja okujjumbira okwekebeza kookolo aleetera abasajja okuzibikira enseke naddala abo abali mu katyabaga kokukwatibwa kokoolo ono okusingira ddala abo abawezezza emyaka 40 n'okugenda waggulu mu munisipaali y'e Mukono mu ggwanga lyaffe Uganda. Nkusaba Ssebo, okkirize okwetaba mu kunoonyereza kuno era nga okusalawo kwo kwa kyeyagalire, awatali kukakibwa

Ekigendererwa ky'okunonyereza kuno: Bwe weetaba mu kunoonyereza kuno, ogenda kuyambako mu kwongera okutegeera ensonga lwaki abasajja abalina emyaka 40 n'okusukkawo ababeera mu munisipaali y'eMukono mu gwanga lino erya Uganda bajjumbira okwekebeza oba lwaki tebettanira kwekebeza kookolo aleetera abasajja okuzibikira enseke. Kino kijja kuyamba mu kuwa amagezi ku ngeri kookolo ono gy'ayinza okuzuulibwanga amangu ennyo nnyini ddala okuyita mu kukubiriza abasajja bonna abali mu katyabaga k'okufuna kookolo ono, gamba okusingira ddala abo abalina emyaka 40 n'okugenda waggulu. Kino kijja kubasobozesanga okufuna obujjanjabi mangu ddala singa babeera bazuuliddwa okubeera ne kookolo ono nga tannaba kubasensera mu mibiri gyabwe.

Okukuuma ebyama: Bwobeera okkirizza okwetaba mu kunoonyereza kuno, ebyokuddamu byo n'ebikukwatako byonna byakukuumibwa nga bya kyama, erinnya lyo terijja kulabikira wantu wonna mu alipoota enaakolebwa ku kunoonyereza kuno era n'empapula zonna eziwandiikiddwako ebibuuzo n'ebyokuddamu byonna ebinawandiikibwa ku mpapula zino zakwokebwa oluvannyuma lw'okwekkaanya ebinaava mu kunoonyereza

THE AIDS SUPPORT ORGANISATION
28 JUN 2013
Approved, Valid Until:
RESEARCH ETHICS COMMITTEE

Okufunamu mu kunoonyereza kuno: Ebinazuulibwa okuva mu kunoonyereza kuno byakuyamba nnyo mu kuwa amagezi ku ngeri kookolo aleetera abasajja okuzibikira enseke gy'ayinza okuzuulibwa n'okujjanjabibwa, amangu ddala ennyo mu basajja abali mu katyabaga k'okufuna kookolo ono. Tewali nsimbi zijja kukuweebwa olw'okwetaba mu kunoonyereza kuno era okunoonyereza kuno nkukola kunsobozese okumaliriza emisomo gyange.

Obulabe: Okunoonyereza kuno tekujja kukuleetera bulabe bwonna. Wabula, kijja kutwala ebbanga eritawera ssaawa emu nga oddamu ebibuuzo ebyateekebwateekebwa

Okukkiriza okwetaba mukunoonyereza kuno: Okwetaba mu kunoonyereza kuno kwa kyeyagalire era oliwaddembe okugaana okukkiriza okwetaba mu kunoonyereza kuno. Oliwaddembe n'okugaana okuddamu ebibuuzo byonna byowulira nga teweekakasa bulungi. Okugaana okwetaba mu kunoonyereza kuno tekirina kyekikufiiriza kyonna mu bulamu bwo. Oluvannyuma lwokuteekako omukono, naawe ojja kusigaza kkopi enteekeko omukono eraga nti weetabye mu kunoonyereza kuno.

Ow'okutuukirira ku kakiiko k'okunoonyereza:

Bw'obeera olina ekibuuzo kyonna ekikwata ku ddembe lyo n'engeri gy'oyisiddwamu mu kwetabaakwo mu kunoonyereza kuno, tegeeza Dr. Boogere Daniel, ku nnamba **0772 139 126** oba **0705 8129 60** osobole okuyambibwa. Nange Omuyizi, Mutumba Robert, akulembedde okunonyereza kuno oyinza okunkubira ku nnamba **0782 456 411** singa wabaawo obwetaavu gyoli

Okukkiriza: Okuteekako omukono wansi wano, kiraga nti ntegedde ebisomeddwa era n'ebinyonnyoddwa byonna ebikwata ku kunoonyereza kuno era awatali kuwalirizibwa nsazeewo okukkiriza okwetaba mu kunoonyereza kuno

Omukono gw'omwetabi	Ekinkumu	Ennaku z'omwezi n'essaawa
Omukono gw'anonyereza		Ennaku z'omwezi n'essaawa

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Appendix III: Questionnaire for Participation

FACTORS INFLUENCING UPTAKE OF PROSTATE CANCER SCREENING AMONG MEN AGED 40 YEARS AND ABOVE IN MUKONO MUNICIPALITY, UGANDA

Dear sir/madam

I am MUTUMBA ROBERT, Master of public health student at Bugema University. I am conducting a study about **factors influencing the uptake of prostate cancer screening among men aged 40 years and above in Mukono municipality, Uganda** Your participation is voluntary. The findings are purely for academic purposes and may inform policy makers and health care providers. Your responses will be treated with outmost confidentiality. Thank you.

Date:.....

A) Respondent's individual characteristics

(1) What is your age? .....Years

(2) Have you been residing in Mukono Municipality for the past 6 months or more? Yes [ ] No [ ] If no, exclude participant from the study

(3) Level of Education: [ ] Never been to school, [ ] primary (P1-P7 level) [ ] secondary level (S1- S6) [ ] post –secondary education (diploma and above)

(4) Marital Status: [ ] never married, [ ] married/cohabiting, [ ] divorced/separated and [ ] widowed

(5) What is your religion? Please tick as appropriate [ ] Catholic, [ ] Protestant,

[ ] Seventh Day Adventist (SDA) [ ] Muslim [ ] Pentecostal and [ ] Other religious denominations: specify.....

(6) Current Occupation: [ ] Civil servant [ ] NGO/Private company [ ] Businessman [ ] Casual laborer [ ] Not employed [ ] other: Specify.....

(7) In what bracket does your monthly earnings in shillings (employed or self-employed) fall? [ ] Less than 30,000/= [ ] Between 30,000-200,000/= [ ] Between 200,000- 500,000/= [ ] Between 500,000-1,000,000/= [ ] More than 1,000,000/=

(8) Do you believe in any cultural practices that hinder men from screening for prostate cancer? [ ] strongly believe in them [ ] believe in them [ ] don't believe in them at all [ ] don't know about them

B) Respondent's knowledge of prostate cancer

(9) Have you heard of Prostate Cancer? Yes [ ] No [ ]

If yes, do you believe that prostate cancer is a common disease? Yes [ ] No [ ]

If yes, do you believe that prostate cancer is a serious disease? Yes [ ] No [ ]

(10) Have you heard/ do you know of Prostate Cancer screening 1= Yes 2= No

If yes, where did you know/hear from about Prostate Cancer?

Friend [ ] Read about it [ ] TV [ ] Radio [ ] Doctor [ ] Nurse [ ] Relative [ ]

(11) Have you ever been tested/ screened for prostate cancer? 1= Yes 2= No

(12) Do you know the symptoms of prostate cancer? 1= Yes 2= No

If yes, what are the symptoms? Difficult or frequent urination [ ] blood in urine [ ] bone pain [ ] painful sex [ ] Loss of sex drive [ ] Infertility [ ]

(13) In your knowledge who gets Prostate Cancer? Less than 40 years [ ] 40-49 [ ] 50-59 [ ] 60-69 [ ] 70years and above [ ] I do not know [ ]

(14) Do you know if prostate cancer is preventable? 1= Yes 2= No 3= Not sure. If yes, how is it prevented?

.....

.....

C) Respondent's knowledge and uptake of prostate cancer screening

(15) Have you heard of prostate cancer screening? 1= Yes 2= No ii) If yes, where did you hear it from? 1= Hospital 2= Doctor 3= Pharmacy 4= Friend 5= Relative 6= Radio 7= Television 8= Newspapers/books/magazines 9= Others: specify.....

(16) Do you think that you are at risk of getting prostate cancer? 1= Yes 2= No 3= Not sure

(17) Have you ever screened for prostate cancer? 1= Yes 2= No If yes, mention the test (s) that were done? .....

(18) How long ago were the test(s) done? .....What made you to go for the prostate cancer screening? .....If no, why? .....

(19) For those who screened: How was the attitude of the health workers? 1= Positive (e.g friendly) 2= Negative (e.g rude) What was the cost of screening? ..... Was the cost affordable or unaffordable? .....

What was the result of the test? 1= Positive 2= Negative If negative, would you be willing to go back for screening in future? 1= Yes 2= No If No, why? .....

(20) Would you recommend a friend to go for screening in the same facility? 1= Yes 2= No If no, why.....

(21) Did you experience any bad feelings such as embarrassment or lack of privacy at the time of screening? 1= Yes 2= No

(22) What do you think gets in the way of people getting screened/ tested for Prostate cancer? .....

Appendix IV: Key Informant Guide

I am called **Mutumba Robert**, a Master of Public Health Student at Bugema University. I am conducting a study about the uptake of Prostate Cancer screening among men aged 40years and above in Mukono Municipality, Uganda. Your participation is voluntary. The findings are purely for academic purposes and may inform policy makers and health care providers. Your responses will be treated with utmost confidentiality.

In your view,

i) What do you know about Prostate Cancer screening and its importance?

ii) What awareness efforts have you undertaken as a health facility to sensitize men on the importance of PC screening?

iii) How is the response? If negative, Probe for reasons why?

iv) What plans do you have to reach out to the men that have not turned up to receive PC screening services?

Thank you for your participation

Appendix V: Data Collection Letter

BUGEMA UNIVERSITY

Main Campus
32km, Gayaza - Zirobwe Road
P.O. Box 6529
KAMPALA - UGANDA

Tel: 256-312-351400
Fax: 256-312-351460

Email: registrar@bugemauniv.ac.ug
Website: www.bugemauniv.ac.ug

P.O. Box 6529 KAMPALA - (U)

SCHOOL OF GRADUATE STUDIES

Chairperson LC 1
Mukono + Goma Divisions
Please assist the research team to collect information from men in your Villages.

Principal Medical Officer
Mukono Municipality
Date: 23/07/2018

July 15, 2018

To Whom It May Concern

RE: DATA COLLECTION

This is to certify that **Mutumba Robert** is a student of Bugema University pursuing a Masters degree in Public Health.

The purpose of this letter is to request you permit him carry out data collection for his research entitled **"FACTORS INFLUENCING UPTAKE OF PROSTATE CANCER SCREENING AMONG MEN AGED 40 YEARS AND ABOVE IN MUKONO MUNICIPALITY, UGANDA".**

The research will be based on utmost ethical considerations and the findings will be for academic purposes and of benefit to the Community

Any assistance extended to him is highly appreciated.

Sincerely,

BUGEMA UNIVERSITY
BOX 6529, K'LA
23 JUL 2018
DEAN GRADUATE SCHOOL

Rosette Kabuye, PhD
Dean, School of Graduate Studies

Bivariate logit analysis

Occupation status

Variables in the Equation									
		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
								Lower	Upper
Step 1[a]	VAR00003	-.723	.373	3.764	1	.052	.485	.234	1.007
	Constant	3.238	.535	36.620	1	.000	25.477		
a. Variable(s) entered on step 1: VAR00003 (occupation status).									

Awareness of the consequences of Prostate cancer

Variables in the Equation									
		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
								Lower	Upper
Step 1[a]	C15(1)	-1.756	.436	16.199	1	.000	.173	.073	.406
	Constant	3.387	.384	77.667	1	.000	29.571		
a. Variable(s) entered on step 1: C15.									

Knowledge level on PC screening

Variables in the Equation									
		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
								Lower	Upper
Step 1[a]	B12(1)	-2.928	.740	15.671	1	.000	.053	.013	.228
	Constant	4.620	.711	42.273	1	.000	101.500		
a. Variable(s) entered on step 1: B12.									

Multivariate logit analysis

Variables in the Equation									
		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
								Lower	Upper
Step 1[a]	B12(1)	-2.359	.762	9.589	1	.002	.095	.021	.421
	C15(1)	-1.491	.570	6.839	1	.009	.225	.074	.688
	Constant	5.214	.784	44.202	1	.000	183.873		
a. Variable(s) entered on step 1: B12 (knowledge on PCS), C15 (Awareness on PSC).									

Awareness and knowledge on PC screening are the significant factors influencing the uptake of PC screening at multivariate logistic regression analysis