Original Research Article

Knowledge of Prostate Cancer Among Men with Urinary Tract Infections at Meru Teaching and Referral Hospital, Kenya

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ABSTRACT

Background: Morbidity and mortality associated with cancer significantly contribute to the increasing non-communicable disease burden. Cancer affects populations across the lifespan but its diagnosis is disproportionately higher in later years of life. The Sub-Saharan Africa region, Kenya included has a high incidence of prostate cancer. Meru County has significantly contributed to the rising incidences of cancer including cancer of the prostate (19.4%). The aim of this study was to assess the knowledge level of PCa among men with UTIs and determine the associated factors.

Methods: In this descriptive cross-sectional survey sixty-five men with UTIs were purposively sampled at Meru Teaching and Referral Hospital, outpatient department. A semi-structured researcher-administered questionnaire was used to capture participant demographic data, anthropometric details and knowledge of PCa. Data were analyzed using Statistical Package of Social Sciences (v.27) and was presented in tables and graphs.

Results: The mean age of the participants was 61.8(±13.5). The majority were married (73.8%) and most were living in rural parts of Meru County (72.3%). Almost 2/3 had primary education and above (64.6%). There were more Christian participants (83.1%). History of BPH and PCa was reported by 43.1% and 32.3% of the participants respectively. The highly and recognized risk factors were older age and use of alcohol and tobacco (87.7%). The highly recognized signs and symptoms for PCa were incomplete emptying of the bladder (96.9%). Participants had high knowledge of PCa risk factors (68.9%) and signs and symptoms (82.7%). In general, participants had high knowledge of PCa (69.2%), a mean score of 76.6 % (±17.23) and a range of 27-100. The knowledge level of PCa was associated with the level of education [((1, χ^2n=65) = 6.532, p = 0.038] although it was not a significant predictor.

Conclusion and Recommendation: Men ≥40 years with UTIs are highly knowledgeable about PCa risk factors and signs and symptoms. There is a need to establish if the high knowledge translates to the prevention of the disease.

Key words: Knowledge; prostate cancer; Urinary Tract Infections; Kenya

INTRODUCTION

Non-communicable diseases (NCDs) are ranked among the top most in contributing to mortality in the whole world, with 41 million people dying each year equalling to 71% of all deaths worldwide.[1,2] According to World Health Organisation (WHO), cancers are second in NCDs mortality after cardiovascular diseases with cancers of the lungs, prostate, colorectal, stomach and liver in men ranked as the five topmost.[2] The burden is equally high in African countries where NCDs contributed up to 40% of deaths in 2015 in the East African Community.[3] It is also estimated that the cancer prevalence may continue to increase in Sub-Saharan Africa (SSA) from 520,348 in 2020 to almost 1 million deaths by 2030.[4] It is also estimated

that non-communicable diseases will be the number one killer disease in Kenya by the year 2030.[5]

Global Cancer reports estimated new cancer cases of 19.3 million and approximately 10 million cancer mortalities in the year 2020[2] and prostate cancer (PCa) was ranked 3rd in incidence globally.[6] Incidences of PCa continue to rise in SSA.[6] PCa and cancer of the oesophagus had the highest incidences between 2008 and 2012 among 9000 new cancer cases reported in Kenya, South Africa, Uganda and Zimbabwe.[7] According to a global cancer report, Kenya had 42,116 new cancer cases and 27,092 cancer deaths in 2020.[2] PCa led in the incidence of cancers among men with 3,412 cases with incidence and mortality rates of 39.9 and 23.1 per 100,000 respectively.

Adequate knowledge on human problems including diseases leads to effective prevention and control measures. This is specifically important for various diseases including cancer that relies on prevention and early diagnosis as the major aspect of effective management.[8] A systematic review on knowledge levels of PCa among African Americans indicated that inadequate knowledge on PCa leads to late PCa detection.[9] The knowledge level of PCa differs. In Pakistan, more than half of the participants in a cross-sectional study had heard about PCa but only less than a quarter knew about its diagnostic test.[10] In Turkey, Imams demonstrated poor knowledge of PCa.[11] In rural parts of Kenya, more than three-quarters of men had heard about PCa but less than half were aware of its screening which resulted in a low level of general awareness of PCa .[12] Similarly, in a cross-sectional study carried out using the Kenya Demographic Health Survey 2014 report, 61.9% of males knew about PCa.[13] But in another Kenyan study , only 29% of men are aware of PCa; 37% of them are not able to identify any PCa signs and symptoms while 31.7% do not know the risk factors for PCa.[14] Furthermore, a retrospective study done in Meru County on the state of cancer in the county (2018) showed that PCa was the most

common (19.4%) of all cancers in men.[15] Besides, men age 40 years and above in Meru County experience UTI symptoms and do not seek medical attention immediately.[16] Most of them will have experienced the UTI symptoms for 1 -2 years before seeking medical attention.[16] Therefore, there is need to determine if men at MeTRH with UTI are aware of the risks of developing PCa and its signs and symptoms.

MATERIALS AND METHODS
Study Design
The study used a descriptive cross-sectional survey design which enabled the researcher was able to evaluate the exposure (UTI) and the result (knowledge of PCa) and analyze the data at only one point in time attributable to this study's chosen design.[15]

Study Population and Sample Size Determination
Male patients aged 40 years and above (the recommended age for PCa screening by the Ministry of Health, Kenya[16]), with urinary tract infections (UTI) and attending the outpatient department of MeTRH were recruited for the study. The study included men above 40 years of age with a confirmed diagnosis of UTI who demonstrated a willingness to participate in the study and provided consent. Men below 40 years of age despite having a confirmed diagnosis of UTI and those who had a diagnosis of PCa whether a survivor or on treatment were excluded from the study. The sample size for the study was determined using Fishers *et al.* (1998*)* formula.[17]

$$n = \frac{z^2 pq}{d^2}$$

Where,

n = the desired population (if the target population is greater than 10,000.

Z = the standard normal deviate 1.96 at a 95% confidence interval

p = the value estimated for the proportion of a sample that has the condition of interest (in this study, the prevalence of prostate cancer

in Kenya is 0.040 (GLOBOCAN, 2020) was considered.

q = 1-p (1- 0.04) = 0.96)

d = the level of statistical significance set.

$= \{(1.96)^2 \ 0.040 \times 0.96) / (0.05)^2$

$=3.8416 \times 0.0384 / 0.0025$

= 59

An addition of 10% of the calculated sample size (6) was added to cater for attrition. Therefore, in total 65 participants were recruited for the study.

Sampling Method
The MeTRH was purposively selected since it is the county's referral hospital that serves quite a large number of populations. The study sample was selected using the purposive sampling technique to get men who met the inclusion criteria. The study included; Men above 40 years of age with an established diagnosis of UTIs with willingness to participate in the study and provided a consent. Men below 40 years old despite having a confirmed diagnosis of UTIs and those who had a diagnosis of PCa were excluded from the study.

Data collection tool
A researcher-administered semi-structured questionnaire was used to collect data. The questionnaire had three sections that collected data on respondents' socio-demographic data, anthropometric measurements and knowledge on PCa. Data was collected for a period of two months (October – November 2022). The questionnaire had eight questions assessing knowledge of PCa signs and symptoms and seven questions on the risk factors for PCa. The fifteen questions had true and false options. A correct answer attracted one point while a wrong answer was a zero score.

Data Analysis and Presentation
After the data had been obtained, it was cleaned, coded, and categorized using MS Excel and then transferred to Statistical Package for Social Sciences (SPSS) v. 27 for analysis. The total score for knowledge on PCa was obtained by adding the total of correct scores in each section of the questionnaire; knowledge on risk factors and knowledge on signs and symptoms. The total score was transformed into a percentage score where the total score was divided by 15 (total possible score of correct responses) and then multiplied by a hundred; (x/15 x 100). Participants who scored 70% and above were determined as high knowledge level while those who scored below 70% were determined as low knowledge level as done in a previous study.[18] Data were summarized using descriptive statistics; mean, frequency, range and standard deviation. A summary of the results was presented in tables. The relationship between knowledge level and sociodemographic and anthropometric measurements was assessed using Chi-Square. Regression analysis was carried out to determine the predictors on knowledge level.

Ethical clearance
Ethical approval for the study was obtained from the Chuka University Ethics and Research Committee (CUIREC/NACOSTI 286) the National Council for Science, Technology and Innovation (NACOSTI); NACOSTI/P/22/19750 as well as the local county administration (EDU.12/3.NOL 1V(59) and the hospital (MRU/C/ED/11/1/297). The study participants signed an informed consent form.

RESULTS
A total of 65 participants participated in the study. The youngest participant was 40 years old while the oldest was 94 years old as shown in Table 1. The mean age of the participants was 61.82 (±13.513). The majority were >66 years old (72.3%), married (73.8%) and had primary education and above (64.6%), most lived in the rural areas (72.3%),. And majority were Christians (83.1%). Most of the participants engaged in farming activities for income generation (41.5%). Less than a quarter of the participants had not enrolled for any medical insurance (18.5%). History of Benign

Prostate Hypertrophy and Prostate Cancer in the family was present in 43.1% and 32.3% of the participants respectively. Most of the participants had a normal weight (81.5%) while a few (18.5%) were overweight.

Table 1: Socio-Demographic and Anthropometric Characteristics of Study Participants (n=65)

Variable		N (%)
Age Age group	Mean (SD) 61.82 (±13.514) Median 62 Range 40 – 94 <66 years ≥66 years	 39 (60) 26 (40)
Marital status	Married Divorced Widowed	48(73.8) 9 (13.8) 8 (12.3)
Highest level of education	None Primary Secondary and above	23(35.4) 21(32.3) 21(32.3)
Place of residence	Rural Urban	47(72.3) 18(27.7)
Religious Affiliation	Christian Muslim	54(83.1) 11(16.9)
Sources of income	Employed Businessman Farming	13(20) 25(38.5) 27(41.5)
Has medical cover	Yes No	53 (81.5) 12(18.5)
Family history of BPH	Yes No	28(43.1) 37(56.9)
Family history of PC Body mass index	Yes No Normal weight Overweight	21(32.3) 44(67.7) 43 (66.2) 22 (33.8)
Waist circumference	Low risk <40 cm High risk 40cm and above	47 (72.3) 18 (27.7)

The highly recognized risk factors were older age and use of alcohol and tobacco (87.7%) as shown in Table 2. The least recognized risk factor was being of the black race increases the risk of developing PCa (50.8%) and a high-fat diet predisposes to PCa (53.8%).

Table 2: Knowledge of risk factors for prostate cancer (n = 65)

	Statement	Yes (%)
1	Obesity may lead to prostate cancer	50 (76.9)
2	Prostate cancer is common in black men compared to other men, and is more likely to get it and die from it.	33(50.8)
3	Prostate cancer is more likely to develop if you have a close family who has the disease.	36 (55.4)
4	Prostate cancer is less likely to develop if you eat a high-fat diet.	35 (53.8)
5	Being sexually active can lower the possibility of getting prostate cancer	46 (70.8)
6	Experts suggest that men aged 40 years and above should be checked for prostate cancer once in a year.	57 (87.7)
7.	Smoking tobacco and harmful use of alcohol are linked with prostate cancer	57 (87.7)
	Low knowledge level <70 High knowledge level >70 Mean (SD) Range	21(32.3) 44(67.70) 68.89(24.7) 0 - 100

The highly recognized signs and symptoms for PCa were incomplete emptying of the bladder (96.9%) and straining to urinate (92.3%) while the least recognized was frequent urination at night (70.8%).

Table 3: Knowledge on signs and symptoms of prostate cancer (n = 65)

Statement	Yes (%)
The occurrence of the following may indicate the presence of prostate cancer	
Frequent urination at night	46 (70.8)
Blood in urine or semen	47 (72.3)
Painful urination	54 (83.1)
Increased urge to urinate	54 (83.1)
A weak urine flow	56 (86.2)

Straining to urinate	60 (92.3)
Presence of terminal dribbling after urinating	53 (81.5)
Incomplete emptying of the urine	63 (96.9)
Low knowledge level <70	14(21.5)
High knowledge level >70	51(78.5)
Mean (SD)	82.75(21)
Range	13 – 100

Majority of the participants demonstrated a high knowledge level of risk factors for PCa (67.7%) and a mean score of 68.89(±24.7) as shown in Table 4. Similarly, many participants had high knowledge level on signs and symptoms of PCa (78.5%) with a mean score of 82.75 (±21). On average, there was a high knowledge on the level of PCa in more than half of the participants (69.2%) with a mean score of 76.6 % (±17.23).

Table 1: Participants' Knowledge Levels on PCa (n=65)

Variable	Frequency
	Total knowledge level on PCa
	N (%)
Low knowledge level <70	20(30.8)
High knowledge level >70	45(69.2)
Mean (SD)	76.60 (17.23)
Range	27 – 100

There was a significant relationship between the participant's level of education and knowledge of PCa [χ^2 (1, n=65) = 6.532, p = 0.038] as shown in Table 5.

Table 5: Association between Socio-demographic and Anthropometric Characteristics and Knowledge Level on PCa

Characteristic	Low knowledge level	High knowledge level	χ^2	df	p–value
	N (%)	N (%)			
Age group					
< 66 years	12(18.5)	27(41.5)	0.106	1	0.745
≥66 years	9(13.8)	17(26.2)			
Marital status					
Married	16(24.6)	32(49.2)	1.652	2	0.438
Divorced	3(4.6)	6 (9.2)			
Widowed	1(1.5)	7(10.8)			
Level of education					
None	11(16.9)	12(18.5)			
Primary	5(7.7)	16(24.6)	6.532	2	0.038*
Secondary and above	4(6.2)	17(26.2)			
Place of residence					
Rural	13(16.9)	34(55.4)	1.677	1	0.195
Urban	8(13.8)	10(13.8)			
Religion					
Christians	16(23.1)	38(60)	1.046	1	0.306
Muslim	5(7.7)	6(9.2)			
Sources of income					
Employed	3(4.6)	10(15.4)			
Businessman	9(13.8)	16(24.6)	1.271	2	0.530
Farming	8(12.3)	19(29.2)			
Patients has medical insurance					
Yes					
No	16(24.6)	37(56.9)	0.007	1	0.933
	4(6.2)	8(12.3)			
Family history of BPH					
Yes	10(15.4)	18(27.7)	0.261	1	0.609
No	10(15.4)	27(41.5)			
Family history of PC					
Yes	7(10.8)	14(21.5)	0.015	1	0.903
No	13(20)	31(47.7)			
BMI					
Normal weight	13(18.5)	30(47.7)	0.250	1	0.617
Overweight	8(12.3)	14(21.5)			
Waist circumference					
Low risk	18(27.7)	3(4.6)	2.785	1	0.095
High risk	29(44.6)	15(21.5)			

BMI – Body Mass Index; BPH – Benign Prostate Hypertrophy; PCa – Prostate cancer; *-statistically significant

A logistic regression model was run for factors that had a p-value of 0.3 and below [30] to assess their influence on the knowledge levels of PCa. These factors were place of residence, education level, religion and waist circumference. The model showed that the level of education, place of residence, religion and WC were not significant predictors of knowledge level of PCa. Table 6 shows that none of the four variables were significant predictors of PCa knowledge levels.

Table 6: Multivariable Logistic Regression showing Factors Associated with PCa Knowledge Levels among Men with UTI Attending MeTRH

Variable	N (%)	COR (95%CI)	AOR (95% CI)	*p*-value
Level of education				
None	23(35.4)	0.286(0.078,1.046)	0.344(0.088,1.354)	.127
Primary level	21(32.3)	1.328(0.302,5.843)	2.124(0.420, 10.750)	.363
Secondary education and above	21(32.3)	1	1	
Place of residence				
Rural	47(72.3)	2.092(0.677,6.465)	2.142(0.453,8443)	0.543
Urban	18(27.7)	1	1	
Religion				
Christian	54(83.1)	1.979(0.527,7.429)	2.002(0.375,10.681)	.416
Muslim	11(16.9)	1	1	
Waist circumference				
Low risk	47(72.3)	0.322(0.082, 1.271)	0.352(0.080,1.536)	.165
High risk	18(27.7)	1	1	

AOR-Adjusted Odds Ratio; COR-Crude Odds Ratio

DISCUSSION

The percentage of participants with a high knowledge level of risks of PCa established in the current study is consistent with previous a study conducted in Nigeria. [20] The similarity in the findings may occur since both studies have focused on men who may be at risk of developing the disease. However, the high knowledge level of risk factors of PCa is inconsistent with studies conducted in Malaysia, South Africa and Uganda. [21,22,23,24] The disparities may be associated with the differences in the type of study participants since some studies were done among college students who most likely tend to think they are not at risk while some focused on men in general. This therefore shows that men with UTI have better knowledge level of the risks of PCa which they might have learnt while seeking medical attention for the illness.

The high knowledge level of risk factors of PCa is further indicated by the participants of this study's ability to recognize specific risk factors to PCa. Only 12.3% of the participants of the current didn't know that older age increases risk of developing PCa. This is because this was lower than what previous studies conducted in South Africa and Kenya. [11,19] However, poor recognition of being of Black race as a risk factor to PCa in the present study was consistent with a study conducted in Nigeria. [20] These similarities may occur since the two studies were conducted in African regions which indicates that the men in this region are not aware of race as a risk factor to PCa. There is need therefore to educate men in African region that being of black race increases risk to PCa.

The high knowledge level of symptoms of PCa identified in the present study is inconsistent with a previous study done in Tanzania. [28] Though both studies were conducted in developing countries and targeted men 40 years and above; the difference on knowledge level of signs and symptoms of PCa may be attributed to the difference in clinical features of the participants. Most men may easily recognize urine emptying symptoms as symptoms of PCa as shown in studies conducted in Saudi Arabia and Ghana. [25, 26.] Similarly, straining to urinate and incomplete emptying of the bladder were the highly recognized signs and symptoms of PCa in the present study.

Previous studies conducted in Malaysia and South Africa found out that men have poor knowledge on PCa. [19, 29]. The present study contradicts their findings since participants

in this study showed high levels of levels of PCa in general. The study in Limpopo, South Africa focused on men 40 years and above while in Malaysia the researchers focused on the general population of men 18 years and above which may contribute to the differences in the knowledge level of PCa observed in the current study.

Knowledge on PCa has previously been associated with level of education. In the present study, knowledge on PCa was significantly associated with level of education. This shows there is a significant association between level of education and knowledge on PCa. However, none of the demographic or anthropometric measurements can be used to predict the knowledge level of PCa among participants of the current study. This supports the results of a study in Ghana where knowledge about PCa was not associated with the sociodemographic characteristics of the participants.[26] Therefore, there may be no significant predictors of knowledge on PCa.

Limitations of the Study

The study had two main limitations. The use of a cross-sectional study design limited the researchers in studying the cause and effect extensively. The sample size for the study was quite small. Further studies should use a bigger sample size for easy generalisation of the results.

CONCLUSION AND RECOMMENDATIONS

Men ≥40 years with UTI at MeTRH have high knowledge of PCa risk factors, signs and symptoms. Knowledge on PCa was significantly associated with the level of education but there were no significant predictors of knowledge level identified in the present study.

Since there are a limited number of studies on PCa among men with UTIs, similar studies should be implemented in other parts of Kenya and the world at large. Furthermore, it is a bit challenging to compare the knowledge on risk factors, signs and symptoms of PCa with other studies

since there exist no standard tool for assessing this. Since PCa is of public health importance and knowledge of the mentioned areas is of primary importance, there is a need to develop a standard tool to assess knowledge of PCa among men.

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