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Prostate Cancer Awareness and Screening among Men in Eldoret, Kenya

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Abstract— **Background: Prostate cancer remains one of the leading causes of male mortality despite advances in its treatment and prevention. The low level of awareness is thought to contribute to delayed diagnosis and hinders goal-directed interventions in prostate cancer prevention.**

Objectives: To determine the level of awareness and screening for prostate cancer among males in a peri-urban population.

Design: Descriptive cross-sectional study and cluster sampling was used to select a sample size of 385 men. Data was collected using an interviewer-administered questionnaire which captured information on demographics, level of awareness and screening for prostate cancer.

Setting: The study took place in Maili Nne, Eldoret Municipality in Uasin- Gishu County.

Subjects: Men aged 40 years and above.

Results: Out of the 385 men 112 (29.1%) were aware of prostate cancer. In response to any cancer they had heard of, 42.14% had heard of breast cancer while 23.5% and 10.7% had heard of cervical and prostate cancer respectively. Given a list of possible symptoms of prostate cancer, 67% could identify at least one symptom. The majority (56.43%) did not know any method of screening for prostate cancer, and among those who knew, the tests identified were a urine test, PSA/Blood Test, digital rectal examination and bone test by 17.4%, 12.86% and 10.71% and 2.9% respectively. Ten percent of the men had been screened for prostate cancer in the five years preceding the study. There was no significant association between prostate cancer awareness and screening behavior (OR 1.704, 95% CI 0.868 – 3.347). Men 40 – 50 years were less likely to have been screened. A belief that prostate cancer is curable; having heard of prostate cancer and knowing that prostate cancer affects men only were significantly associated with the probability of having undergone screening.

Conclusion: Awareness of prostate cancer among men in Maili Nne is low, and screening remains unacceptably low. Public health interventions aimed at reducing prostate cancer mortality should aim at increasing awareness as well as behavior change to embrace screening.

Index Terms— **Prostate cancer, Awareness, Screening.**

I. Introduction

Prostate cancer is the second most common cancer in men, after skin cancer [1]. In Africa, it affects 1 in 6 men [1], and yet only a few studies have been done to determine the level of awareness among the male population at risk. Although there are no specific prostate cancer burden statistics from Kenya, it has been estimated that there are 1,007 new cases of prostate cancer and about 850 deaths annually [1].

In a study done in Europe among the general public, 39% of male respondents mentioned prostate cancer as one of the cancers they had heard of [2]. In the same study, the proportion of respondents who knew Digital Rectal Examination (DRE) and urine testing as diagnostic tests for prostate cancer was 15% and 14% respectively. The low level of awareness of prostate cancer was in contrast to the high awareness of breast cancer ([9%] among women (2).

A study conducted in Nigeria (3) on Level of Awareness, Perception and Screening Behavior Regarding Prostate Cancer, found that 156 (39.2%) respondents had heard of prostate cancer, while 66 (16.6%) were able to identify where the prostate gland is located, an indication that the awareness about the disease was low.

In a New York study among men aged 50 years and older, fewer than 10% of the men perceived their prostate cancer risk to be high, and almost 20% perceived no risk of developing the disease [4]. Approximately 60% of the men reported having had a prostate-specific antigen (PSA) test. Physician advice was significantly associated with screening for prostate cancer and the methods used were a PSA test and digital rectal examination.

Based on racial differences in mortality ascribed to prostate cancer in America, Weinrich et al. concluded that lack of knowledge regarding prostate cancer screening and lack of participation in the screening procedures were the main underlying factors [4]. In their study, they found that only 14% and 18% of African Americans had a high level of prostate cancer knowledge and had heard of prostate-specific antigen (PSA) and digital rectal examination (DRE) as diagnostic tests for early detection of prostate cancer respectively [4].

Although prostate cancer is a public health problem all over the world, there is lack of statistics from developing world [1] that would help to advise strategies to improve knowledge, awareness, and practice as well as serve as a baseline for evaluation of such interventions. This study was carried out to bridge this gap in knowledge by determining awareness and specific knowledge among men aged 40 years and above. Also, the study reports on the frequency of prostate cancer screening and whether there is any association between awareness and screening.

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II. MATERIALS AND METHODS.

This study was a descriptive cross-sectional study carried out in Maili Nne estate in Uasin Gishu County, Kenya which is a peri-urban community. The study population was all male residents aged 40 years and above. Maili Nne was divided into six clusters based on the six administrative villages. Every third homestead in a cluster was selected, and all the male members who satisfied the study criteria were interviewed until the requisite 385 respondents had been interviewed. Men who had had prostate cancer were excluded. This study was approved by the Institutional Research and Ethics Committee (IREC) of Moi University College of Health Sciences. Informed consent was obtained from each participant. Data was collected using an interviewer-administered questionnaire. The items on the questionnaire were divided into three sections covering demographics, level of awareness and screening behaviour towards prostate cancer. Data collected included age in years, religion, occupation, education level, level of awareness, knowledge of methods of screening and screening frequency.

Awareness in this study was judged as having in-depth knowledge about prostate cancer. Determining the level of prostate cancer awareness was based on responses to nine questions that captured spontaneous responses about the type of cancer heard of, direct question whether respondents had heard of prostate cancer, what gender is affected, risk factors, measures of reducing risk factors, signs and symptoms associated, modes of treatment and prognosis of prostate cancer. Each positive response earned the respondent one point, and each negative or uncertain response earned zero points. The total score was calculated, and respondents who scored 50% and above were considered to have awareness.

Descriptive statistics were used to calculate frequency and percentage in various categories. Awareness was calculated as a percentage of total respondents who were aware. The association between awareness and screening was analysed using multivariate logistic regression.

III. RESULTS

A. Demographic Characteristics

A total of 385 respondents were interviewed. Fifty percent were in the age group of 40 to 50 years while 22.15, 20.7% and 7.14% were in the age groups 51 to 60, 61 – 70 and above 70 years respectively. Eighty-five percent were Christians while Muslims and Hindus were 14.3% and 0.7% respectively. Of all the respondents, 40.71% had attained secondary level education while 30.71%, 23.57%, and 5% had attained tertiary, primary and informal education.

Table 1. Demographic Data

Variable	Frequency	Percentage
Marital Status		
Married	272	70.6
Single	69	17.9
Divorced	31	8.1
Separated	13	3.4
Income		
Informal	238	61.8
<10000	64	16.6
10001 – 20000	24	6.2
20001 – 40000	35	9.1
>40000	24	6.2
Age group		
40 – 60	193	50.1
51 – 60	85	22.1
61 – 70	80	20.8
>70	27	7
Religion		
Christian	327	84.9
Muslim	55	14.3
Hindu	3	0.8
Education		
Primary	81	23.1
Secondary	156	40.5
Tertiary	121	31.4
None	19	4.9

B. Awareness of prostate cancer

Out of the 385 respondents, only 112 (29.09%) were aware of prostate cancer. In response to a direct question whether they had heard of prostate cancer, 58.6% had heard of it. When asked about the different types of cancer they had heard of 42.14% mentioned breast cancer, 23.57% cervical cancer, 14.29% esophageal cancer and 10.71% prostate cancer. When given a list of possible symptoms associated with prostate cancer (back pain, hair loss, impotence, difficulty in emptying the bladder, blood in semen and weight loss) 63 % of the respondents were able to mention at least one of the symptoms.

C. Screening behavior

Out of all the respondents, 10.4% had been screened for prostate cancer in the five years preceding the study of whom 5.7% was by DRE, 3.6% by PSA and 1.1% did not know the screening test used. Only 4.29% had undergone the test within one year, 3.57% within 2-3 years and 1.43 % within 4-5 years preceding this study. Regarding knowledge of methods for screening for prostate cancer, the majority (55.8%) did not know any method while 17.14%, 12.7%, 10.7% and 2.9% identified urine test, PSA/Blood Test, Digital Rectal Examination (DRE) and bone test respectively.

There was no significant association between prostate cancer awareness and screening behavior (OR 1.704, 95% CI 0.868 – 3.347). On multivariate analysis the independent factors that were likely to increase the probability of screening were having heard of prostate cancer, knowing the gender affected by prostate cancer and believe that prostate cancer can be cured. Compared to other age groups, being in the age group of 40 to 50 years significantly decreased the probability of being screened (table 3). Marital status and religion were not significantly associated with screening (OR 0.99 and 1.323; CI 0.407 - 2.27and 0.577 – 2.54 respectively).

Table 2. Knowledge about Prostate Cancer

Variable	Frequency	Percentage
Type heard of		
Breast	161	41.8
Cervical	93	24.2
Oesophagus	55	14.2
Prostate	42	10.9
Others	11	2.9
Don't know	23	6
Gender affected		
Men	143	37.1
Women	57	14.8
Both men and women	97	25.2
Don't know	88	22.9
Symptoms of prostate cancer		
Blood in urine	79	20.5
Excessive urination	66	17.1
High temperature	53	13.8
A headache	43	11.2
Don't know	144	37.4
Risk Factors		
Venereal Diseases Exercise	56	14.5
Drinking alcohol	52	13.5
Family history	51	13.2
Old age	43	11.2
Exercise	35	9.1
Stress	26	6.8
Don't know	122	31.7
Treatment		
Surgery	80	20.8
Chemotherapy	59	15.3
Hormone therapy	38	9.9
Radiotherapy	33	8.6
Don't know	118	30.6
Ways of diagnosis		
Urine test	69	17.9
Blood test/PSA	49	12.7
Direct Rectal Examination	41	10.6
Bone test	11	2.9
Don't Know	215	55.8

Table 3. Factors associated with having undergone screening for prostate cancer.

Variable	ODDS RATIO	Significance	95% confidence interval	
			Lower bound	Upper bound
Age group				
40 to 50 years	.4	.04*	.164	.96
Over 50 years	Ref			
Education				
Primary	.47	.26	.13	1.7
Any other level or none	Ref			
Type of cancer known				
Prostate cancer	6.7	.000*	2.4	18.9
Any other cancer or none	Ref			
Prostate cancer symptoms				
Knew				
Did not know	1.1	.82	.45	2.8
	Ref			
Gender affected by prostate cancer				
Knew	.14	.000*	.05	.38
Did not Know	Ref			
Risk factors for cancer				
Knew	1.141	.78	.45	2.8
Did not know	Ref			
Thought there is a cure for prostate cancer				
Yes	8.75	.001*	3.2	24
No	Ref			

*Significant association

Ref - Reference

IV. DISCUSSION

This study has demonstrated a low level of prostate cancer awareness, with only 29% of respondents being aware. Other studies have reported similarly low levels of awareness and knowledge of prostate cancer. Arafa et al. in their study in Egypt, Saudi Arabia, and Jordan, reported low knowledge scores in all the three countries [5]. Olodimejio et al. in Nigeria reported knowledge score of 5.8 out of a maximum of 16 points [6].

Similarly, Ajabe in Nigeria found that only 21.2% of men surveyed had information on prostate cancer [7]. Knowledge gaps and low awareness of prostate cancer have been reported in developed countries too. A survey in Europe and the USA reported that only 39% of men were aware of prostate cancer [1].

When we compare the percentage of men aware of prostate cancer on direct questioning (58.6%) and those aware based on knowledge score (29%), there is a significant disparity. In Nigeria, Olodimejio reported awareness based on one direct question as 80% but on assessing knowledge the score was less than 30% [6]. The results suggest that even though men may have heard of prostate cancer, it does not directly lead to knowledge about prostate cancer and therefore may not influence health-seeking behavior.

Four times more men knew of breast cancer as compared to those who knew about prostate cancer, yet breast cancer mainly affects women. The reason may be more public health awareness campaigns for breast cancer, and this could be used to inform public health interventions in prostate cancer. Only 37.1% of men knew that prostate cancer affects men only which is a gap in prostate cancer knowledge. Similarly, an independent poll by Prostate Cancer Charity in 2008 found only 1 in 10 men knew where the prostate gland is located [8], while Arnold-Reed found that 80% of men did not know the functions of the prostate [9]. Two-thirds of the respondents knew at least one symptom of prostate cancer. Majority, however, identified blood in urine as a symptom, yet this is a late symptom and therefore suggests that men identify prostate cancer in a late-stage which may not be amenable to curative treatment.

In this study, only 24.4% knew the risks of prostate cancer. The rest of the responses demonstrated poor understanding and misconceptions regarding risks of prostate cancer. In Uganda, a study on knowledge of prostate cancer among men reported that only a third of men were able to identify risk factors for prostate cancer [10]. Similar studies have been reported in the USA [11]. Knowledge about investigations used to diagnose prostate cancer was equally limited whereby over half of the respondents were not aware of any investigation. Inadequate knowledge of risk factors and diagnosis of prostate cancer may impact negatively on efforts aimed at increasing early screening for prostate cancer.

The low rate of awareness parallels the low rate of screening, with only 10.4% of the men having been screened for prostate cancer. In one study in Nigeria, no man had been screened for prostate cancer through 21. 2% were aware of prostate cancer [7]. In Oyo state in Nigeria, a screening rate of 4.5% was reported. Awareness of prostate cancer in this latter study was based on one direct question and reported as 80%, however, when a knowledge score based on causation, treatment, and prevention was computed the mean score was about 30%, and therefore both screening and knowledge score was low [6]. In the Arabian communities, screening was reported at 8-30% similar to the finding in this study [5]. The rate of screening in developing countries seems to fall below 30% which is much lower than the reported rates of above 60% in the European nations [12]. This difference could be explained by among other factors, lack of vigorous public health campaigns in the developing countries.

Awareness of prostate cancer in our study was not a significant predictor of being screened. Lambert et al. reported similar findings where 75% of men knew about prostate cancer, but only 26% had been screened for the same [3]. Livingstone in his study compared male doctors and community men, and even though 83% of the doctors were aware of prostate cancer, only 45% of them had undergone screening as opposed to the awareness of 55% but screening

rate of 56% among community men [14]. There might be other predictors of prostate cancer screening in addition to or independent of awareness.

It has been reported that men over 50 years are at higher risk of prostate cancer, however in high-risk populations like black Americans and those with a family history of cancer the risk is higher at a younger age. The risk in our population is, however, unknown, and most people are unaware of the family history of the disease. Therefore, men do not seek screening early. In this study, it was found that men in the age group of 40-50 years were less likely to have undergone screening which may be explained by the low level of awareness.

Men who mentioned prostate cancer as one of the cancers they knew and those who knew that cancer affects men only were more likely to be screened. It has been shown that increased knowledge directly leads to increased uptake of screening [19], [20], [21]. Our study supports the need for increased education on prostate cancer understanding in order to increase screening.

Men who believed that prostate cancer had a cure were more likely to go for screening. The preceding is in line with the health belief theory [22] which would lead to an individual's perceived benefits from health intervention to outweigh barriers. Education, religion and marital status were not significantly associated with the probability of screening which is similar to findings in China and Italy [23]. However, in Nigeria one study reported that education was correlated with screening for prostate cancer [25]. The findings suggest that the influence of level of education on the probability of screening is controversial and may be dependent on other contextual factors.

V. CONCLUSION

Awareness of prostate cancer among men in Maili Nne is low, and screening remains unacceptably low. Public health interventions aimed at reducing prostate cancer mortality should aim at increasing awareness as well as embrace screening.

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