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Knowledge is Power: An Exploratory Study on Information Sources for Prostate Cancer among Men in Nairobi County, Kenya

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Abstract

Background: Prostate cancer (PCa) is a major global health concern worldwide. Studies however show that screening leads to early diagnosis, but despite the measures put in the government of Kenya to create awareness on screening services, the turn up is still low as 2.3% in 2022. The study therefore sought to determine the role knowledge plays in influencing decision to screen.

Methods: The study was guided by Gelberg-Anderson behavioural Model for Vulnerable Populations and adopted a mixed method approach through a cross-sectional survey complemented by a desk review of secondary data. Fischer et al's method was used to derive a sample of 384 men aged between 35 and 50 years and 15 key informants who were purposively selected. Quantitative data using the statistical package for social sciences, and presented in Tables and charts. Qualitative data was analyzed thematically in which concepts were identified and emerging themes generated, and presented in narrative form. All ethical principles were observed.

Results: The study determined that there was a variance between awareness and uptakes of screening. Social media had been vastly used as a source of information, however it proved to be distorted at some level, giving inadequate information that could lead to wrong diagnosis and couldn't also reach majority of people.

Conclusion: Thus the study concludes that the fight against cancer must incorporate correct and elaborate information from medical practitioners with emphasis on risks and benefits of PCa screening.

Keywords: Prostate Cancer; cancer screening; cancer awareness, cancer treatment outcomes.

1. Background

Prostate cancer (PCa) is a major global public health concern, being the most common type of cancer in men (Blocker, 2016; Ajape, Babata 2017), and the second leading cause of death among men worldwide (American Cancer Society, 2017). In 2016, it was estimated that PCa made up 29 % of newly diagnosed cancers in men, with nearly half of this population expected to die of the disease (American Cancer Society, 2017).

High rate of mortality associated with PCa in Africa has also been attributed to late detection (Akigbe and Akigbe, 2012; WHO; 2015; Ajape, Babata 2017).

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Like most other cancers, symptoms of PCa only present themselves during later stages of the disease's development, during which time treatment outcomes are typically poor, especially in developing countries with weak healthcare systems (WHO; 2015; Ajape, Babata 2017;Azubuike, & Okwuokei 2016).

According to World Health Organization (2015) when detected early, PCa is easily treatable, but its prognosis worsens as it develops into later stages. Unfortunately, like other cancers, the early stages of PCa are asymptomatic, meaning that patients do not present with any symptoms. However, there is general consensus that cancer screening results in early diagnosis, which improves its prognosis by slowing down or curbing the disease's development thereby reducing morbidity and mortality rates (Ajape, Babata & Abiola, 2017; WHO; 2018). Thus, the most effective intervention tool for PCa is screening and early diagnosis (American Cancer Society, 2017; WHO, 2015)

According to Cancer Research UK. (2018), men aged between 35 and 50 years should screen for PCa at least once every year. Towards this end, the WHO urges nation states to support and facilitate early screening for prostate and other cancers (WHO, 2015).

In response to the call by WHO, several governments have put in place structures to facilitate early screening for PCa. This is especially so for developed countries and some Asian countries such as Bangladesh (Salam 2015). In Africa however, many countries are yet to establish PCa screening programs, structures and systems. In Nigeria for instance, PCa screening is largely driven by the media, because there is no active screening program organized by the government (Ajape and Babata, 2017). Similarly, in South Africa, although there are national cancer registries for breast and cervical cancers for women, none exists for PCa, with no well-established or structured PCa screening programs.

In Kenya, apart from the available policies, there exist progmatic interventions accompanied with several PCa screening tests. Furthermore, several

campaigns and awareness programs have been implemented in Kenya to raise awareness and promote early screening and detection of PCa among men below the age of 50 years. In Kenya's capital Nairobi for instance, the county government has partnered with Africa Cancer Foundation to continuously conduct cancer awareness campaigns to encourage early screening for early diagnosis and treatment (According to Daily Nation, 2008 published on World Cancer day) .

The awareness campaigns in Nairobi are especially relevant because Nairobi County has the highest number of health facilities that offer cancer screening services, compared to other counties (Ipsos Synovate , 2014) . The County is also home to three referral hospitals that offer screening services - Kenyatta National Teaching and Referral Hospital (KNTRH); Kenyatta University Teaching and Referral Hospital (KUTRH); and Mama Lucy Kibaki Referral Hospital (MLKRH); in addition to several level five private hospitals such as the Nairobi, Agha Khan, MP Shah, Mater, Nairobi Women's, among others.

Kenya has adopted several PCa screening tests, including the serum Prostate-Specific Antigen (PSA) concentration, which is a blood test; Digital Rectal Examination (DRE) which is a physical examination; and the transrectal ultrasound (TRUS) and random ultrasonically guided multiple prostatic biopsies (RUMPB) which are both ultrasound-based. The availability of PCa screening resources, especially in Nairobi, and consistent awareness campaigns that encourage screening have not been successful in increasing the rate of men who screen for PCa, as evidenced by the fact that only 4.1% of men age have undergone screening for PCa in Nairobi (MPHS/MMS, 2019). Despite the aforementioned interventions, screening for PCa among men remains low at 4.1 % among the general population (MPHS/MMS, 2019).

This low percentage as been majorly contributed by the kind of information they have at hand over PCa. Mostly information source is normally from mass media. For instance, Ogundele 2015,

reported that 83% of the respondents had heard about PCa from mass media. Oladimeji 2010 also denoted the same at 80% with healthcare workers coming last at 31.5% Back here in Kenya, (Wanyagah, 2017) recorded 29.1% with healthcare workers at 3.3%, (Mbugua et al, 2017) also recorded 3.8% from healthcare workers and was the lowest among the sources he identified. This trend in healthcare workers is worrying since they should be at the forefront in disseminating information on PCa. According M. Arafa (2012), information from medical practitioners is instrumental in increasing knowledge in men. The right information of a disease leads to informed decision making and improves quality in many clinical contexts. Social media gives firsthand information, but has limited information, is limited to educated population and those with compatible devices, and many a times carry distorted information (Gough, Hunter; Ruth, & Aaboutdhna, 2020). This distorted decision-making leads to wrong diagnoses thus leading to wrong treatment outcomes. (WHO, 2018), highlighted that poor knowledge on signs and symptoms combined with fatalistic beliefs and negative attitudes are main reasons for late presentations of PCa. This study therefore sought to evaluate health care worker involvement in disseminating knowledge on PC screening.

2.   Materials and Methods

This was a cross-sectional survey which adopted mixed-method approach with a desk review of secondary data. It was conducted in Nairobi County. Nairobi occupies an area of 689 km^2, and is a metropolis with representation of all the ethnic groups in Kenya and the world. Questionnaires were distributed among 368 respondents who were males and had stayed in Nairobi for not less than two years and had consented to participate in the study. Qualitative data was also collected by respondents were purposively selected and divided through 4 wards using simple random sampling frame. Focus group discussions were held among the main respondents while interviews among 15 key informants, who included 10 clinical officers, 2 public health officers and 3 community health volunteers purposively

selected. Face validity was determined by help of the supervisors while reliability was achieved through a pilot study of 39 respondents from Makina ward of Kibra Sub County and Mountain View of Westland Sub County. Cronbach's Alpha was then used as a measure of reliability. Quantitative data was data was analyzed in descriptive tests, such as averages-mean, median, standard deviation, percentages, presented in tables while Qualitative data collected was coded, summarized, analyzed thematically presented in narrative form.

3.   Study Results

The study sought to establish respondents' sources of information on prostate cancer, and their responses are recorded in Table 1.

Table 1: Respondents' sources of knowledge on PCa

	Frequency	Percentages
Heard from Social Media	171	46.5
Watched on TV	114	31.0
Heard from a Friend	102	27.7
Heard from a Relative	42	11.4
Heard from a Doctor /Nurse	29	7.9

As can be seen in Table 1, the largest proportion of the respondents (46.5%) mentioned social media as their source of information on PCa. The second largest proportion (31.0%), identified television as their source, followed by a friend (27.7%), a relative (11.4%) and lastly a medical practitioner (7.9%). This finding was corroborated by qualitative data from focus group discussions, which confirmed that social media plays an important role in disseminating information. One of the participants of a group discussion had this to say;

"Most of my information I get from my phone, I don't concentrate much on my television or radio because I don't have time for the news. With my phone, I can easily search for anything I want and get information. Besides, some of these information we get from many of the social websites such as face books, twitter or WhatsApp." (Focus Group Discussion 3, 20/08/2021]

Data from key informant interviews further revealed that knowledge of PCa has spread quite rapidly among the public mostly through social media in recent years. In fact, one of the officers had this to say;

"Nowadays people access information easily through social media and owing to the spread of the disease which is quite rampant, nearly every male adult have the information regarding the scourge of PCa. In fact I can confidently say that most men above 25 years have information on the disease and can even tell its symptoms". [Interview; Clinical Officer 5, 16/08/2021]

Available literature further confirms that social media platforms offer vast opportunities for education on PCa and other health-care matters (Gough, Hunter; Ruth, & Aradhna, 2020). Social media platforms were the main disseminators of information on cancer in North Africa (Arafa, Rabah, & Wahdan, 2018) and Nigeria (Oladimeji, Bidemi, Olufisayo, & Sola, 2018). Nevertheless, it is instructive to note that even though social media provides is a vast repository of information for a large number of people, it has its limitations. For instance, it cannot reach those with incompatible devices, and has been proven to be a source of inaccurate information and sometimes, outright distortion and misinformation (Gough, Hunter; Ruth, & Aradhna, 2020).

Data in Table 1 also indicates that only 5.9 % of the respondents mentioned healthcare practitioners as their source of information on PCa. This could be indicative that most of the respondents do not visit health facilities for routine check-ups, and only do when they are ill because typically, one must visit a healthcare facility in order to obtain information from healthcare practitioners, during consultation. The revelation that most of the respondents do not visit healthcare facilities unless they are ill was further confirmed by qualitative data from FGDs and KIIs. During FGDs, it emerged that almost none of the participants visited healthcare facilities for routine checkups, due to various reasons, ranging from the high costs involved, to inherent fear of healthcare facilities. According to one FGD participant:

I would rarely visit an healthcare facility for routine medical checkup and also obtain a health information such as that of PCa because of the cost of routine checkup and also because I just fear an hospital environments (Focus Group Discussion, 2, 20/08/2021)

The abovementioned sentiments were confirmed by a key informant, who said:
Many of the residents of this area don't practice routine medical checkup and be acquainted with the medical information because of the belief that the routine checkup is very costly (Clinical Officer 5, 16/08/20210)

The above mentioned revelation is disconcerting because there is evidence that routine medical checkups can lead to early detection of not only PCa, but other cancers as well (Yu, & Zhou, 2020; Boustany et al., 2021). It can also lead to early detection and treatment of chronic diseases such as hypertension and heart conditions, among others (Boschheidgen et al., 2022; Taitt, 2018). Furthermore, studies show that sick-visits do not accord ample opportunities for routine tests, since the healthcare practitioners tend to concentrate on finding and attending to the main cause of illness that necessitated the visit (Zhu, Idemudia and Feng, 2019; Moris et al., 2020). PCa

Noticeably, none of the respondents mentioned awareness campaigns as a source of information on PCa. This is of important note, since the study area has been targeted by various awareness campaign initiatives, from both the Kenya national government and the County government of Nairobi. This was confirmed by qualitative data from both FGDs and KIIs.

Knowledge on causes of PCa
To further assess knowledge on PCa, respondents were asked to list the causes of PCa that were known to them, starting with the most to the least common cause. Table 2 shows their responses.

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Table 2: Respondents' knowledge on causes of PCa

Causes of PCa	Frequency	Percentages
STIs	154	41.8
Obesity	151	41.0
Witch craft	110	30.1
Impotence	110	29.9
Alcohol	78	29.0
Old age	100	27.1
Genetic factors	99	26.9
Having many sexual partners	89	24.1

As can be seen in Table 2, STIs and Obesity were perceived by the largest proportion of respondents to be the main causes of PCa. Such perceived causes are outrightly distortional and can result in negative outcomes for persons diagnosed with PCa. For instance, close to one third (30.1%) perceive witchcraft as the cause for PCa, with the implication that such persons would seek ethnomedical solutions for treatment because, according to Shivachi and Otengah (2017), in assessing socioeconomic determinants of maternal healthcare-seeking behaviour in the informal settlements of Nairobi, highlighted that, the decision on which healthcare options to select is influenced by the perceived cause of illness. Furthermore, some of the perceived causes could result in stigma. For example, having many sexual partners was identified as a causal factor by 24.1% of the respondents. This implies that persons diagnosed with PCa can be stigmatized as being promiscuous. Another distortional perception is that being of non-African race disposes one to PCa. These respondents view PCa as a disease that affects mostly Caucasians, which is untrue.

Other distortional perceptions with potential for stigma and maltreatment by society include the belief that PCa is caused by STIs (41.8% of respondents), and that impotence is one of the risk factors (29.9% of the respondents). According to Shivachi, Sidha and Ayabei (2019), in the informal settlements of Nairobi, STIs are associated with promiscuous behavior. Considering that a large proportion of the respondents to this study were resident in the informal settlement of Kibra in Nairobi, the perception that PCa is caused by STIs is a potential cause of stigma for persons diagnosed with PCa. Further to this, the perception that PCa is associated with impotence appears to be popular in the study area, and has already been a source of family strife, as narrated by one FGD participant.

"I remember on one occasion, a neighbor who was diagnosed with PCa disowned his children, ostensibly because he read online that impotence is one of the causes of PCa".

Other causes identified were alcohol (29.0%), old age (27.1%), genetic factors (26.9%) and having many sexual partners (24.1%).

The findings in Table 2 are not quite encouraging as far as knowledge of PCa causal factors is concerned, considering that not even half the respondents could identify the causal factors associated with PCa. According to Blocker et al (2016) and Chan, Gann, & Giovannucci, (2015) knowledge of the causes associated with a disease, is important for prevention and management. Whereas the causes of PCa are still the subject of medical research, the main risk factors associated with the disease include age, rural exposures that are mainly occupational such as farming and environmental, personal smoking history, family history of prostate and other cancers, as well as obesity (World Health Organization. (2019).

Disturbingly, it emerged from qualitative data that some of the aforementioned misinformation was obtained from social media platforms. This is especially disconcerting, considering that close to half (46.9%) of the respondents identified social media as a source of information on PCa. This implies that any misinformation on social media is likely to have damaging impacts on PCa awareness.

Prostate cancer and age
This study also sought to establish respondents' awareness of the relationship between age and PCa. Respondents were therefore requested to rate, on a scale of 1 – 5, the risk of various age groups of people getting PCa, (*Where 1=Very low risk; 2= low risk; 3=Average risk; 4=High risk and 5=Very high risk*). Table 3 shows their responses.

Table 3 Rating the risk of the age groups of people getting PCa

Group of people	1	2	3	4	5	Mean	SD
35-39 years	79(21.5%)	86(23.4%)	141(38.3%)	23(6.3%)	39(10.6%)	2.61	0.98
40-44 years	61(16.6%)	59(16.0%)	156(42.4%)	34(9.2%)	58(15.8%)	2.92	0.94
45-49 years	32(8.7%)	44(12.0%)	131(35.6%)	68(18.5%)	93(25.3%)	3.40	0.79
50-55 years	21(5.7%)	31(8.4%)	42(11.4%)	65(17.7%)	209(56.8%)	4.11	0.74
55-60 years	23(6.3%)	29(7.9%)	21(5.7%)	62(16.8%)	233(63.3%)	4.23	0.68

Data in Table 3 clearly shows that for most of the respondents, age is perceived to be a major risk factor for PCa. Data in Table 4.5 is consistent with the information in Table 4.4, which shows that close to one third (61.8%) of the respondents identified age as a risk factor for PCa. In Table 4.5, close to half (44.9%) of the respondents perceive males between the ages of 35 and 39 years as being at very low or low risk of getting PCa. Only 16.9% of the respondents perceive this age group as being at high or very high risk (Mean = 2.61; SD 0.98). Table 4.5 also shows that perceived risk increases with age, peaking at the 55 to 60 years age bracket, which is perceived to have either high or very high risk by approximately four fifths (80.1%) of the respondents (Mean = 4.23; SD 0.68).

Data in Table 3 is corroborated by qualitative information obtained from key informant interviews, which shows that PCa is rarer in men younger than 40 years, but the chance of having PCa rises rapidly after the age of 50 years. One of the clinical officers had this to say during the interview,

Men with over 50 years are most at risk in getting PCa and the older a man is, the greater the chance of getting PCa. Based on our records, patients who have been diagnosed with PCa are mostly men above 50 years. [Interview, Clinical Officer 8, 16/08/20210]

Data in Table 3 is also consistent with Mirzaei-Alavijeh *et al* (2018) in assessing PSA test uptake on elderly men in Western Iran also found that the risk of PCa is perceived to increase with age, especially after the age of 50 years.

The implication of the data in Table 3 is that in relation to age, the level of PCa awareness among the respondents is fairly high, considering that a considerable proportion was able to correctly relate PCa risk with age. This knowledge is consistent with available scientific information, because many studies have established that PCa is a disease that largely affects the elderly male population averaging 65 years old and above and a large percentage of deaths due to this disease occur in men 75 years and above (Weinrich, 2016; Humphreys, Fernandez, Sridhar 2018; Li, 2016).

Respondents' Knowledge of preventive measures for PCa

This study sought to establish respondents' knowledge of preventive measures for PCa, as part of their knowledge on the disease. Respondents were therefore asked to freely list the PCa preventive measures known to them. Their responses are presented in Table 4

Table 4 Prostrate cancer preventive measures known to respondents

Measures	Frequency	Percentages
Reducing red meat	209	56.8
Healthy body weight	201	54.6
Avoiding STIs	164	44.6
Having sex regularly	121	32.9
Exercising regularly	65	17.7
Sexual fidelity	61	16.6
Avoiding alcohol	60	16.3

As can be seen in Table 4, majority of the respondents (56.8%) cited reducing intake of red meat as a preventive measure. Other preventive measures that were identified include maintaining a healthy body weight (54.6%), avoiding STIs (44.6%), having sex regularly (17.7%), staying faithful to one partner (16.6%) and avoiding alcohol (16.3%).

Data in Table 4 reveals a consistency between the causal factors identified in Table 4, and the perceived preventive measures. For instance, maintaining a healthy body weight, eating healthy and regular physical exercises are all intended to slow down the effects of aging and to eliminate obesity, both of which were identified as causal factors in Table 4. Similarly, 37.8% of the respondents mentioned spiritual protection as a preventive measure, which corresponds closely to the 30.1% who identified witchcraft as a causal factor (see Table 4). Regarding spiritual protection, qualitative data obtained from FGDs shows that the protection in question ranges from prayer to ethno medical interventions such as regular consumption of protective herbal concoctions, as well as protective spells and artifacts.

Additionally, in Table 5, close to one fifth (17.7%) of the respondents mentioned avoidance of STIs as a preventive measure, which compares to 22.2% who mentioned STIs as a causal factor in Table. 4 on page 59. In similar vain, alcohol consumption was mentioned by 9.2% of the respondents as a causal factor in Table 4, and avoidance of alcohol receives mention by 16.3% of the respondents in Table 5.

In this respect, this study is in congruence with Shivachi and Otengah (2017), who aver that the perceived causes of a disease will influence the preventive measures taken, as well as the treatment choices made. The aforementioned finding is also in line with the Gelberg-Andersen behavioral model for vulnerable populations, which guided this study. According to the model, preventive healthcare measures are influenced by perceived predisposing constructs (Andersen, 1968; Gelberg, Andersen, & Leake, 2010).

Nevertheless, is worrisome that early screening was not mentioned by any of the respondents. This is a notable anomaly considering that the main focus of the PCa awareness message as disseminated in the study area is the need for early screening. According to information obtained by this study, including information, education and communication (IEC) material that were obtained by the researcher, as well as qualitative data from key informants, the main focus of PCa awareness campaigns is to urge men to go for early screening. In the words of one key informant:

"The main message in all PCa awareness, whether they are by national or county government, or other change agents, is early screening. We do not understand why these awareness message does not translate into higher numbers of men getting screened." [Interview, Clinical Officer 9, 18/08/20210]

The aforementioned sentiments, and the data in Table 4 are indicative of a disconnect between awareness campaigns on one hand, and knowledge of early screening on the other hand, in relation to PCa. Qualitative data from FGDs and KIIs reveals that awareness campaigns have been conducted in the study area, and that, as highlighted by key informants, early screening was the key message. Nevertheless, as can be seen in Table 3, only a small proportion of the respondents (21.7%) mentioned early screening as a preventive measure. This disconnect could be partially explained by data in Table 3, whereby none of the respondents mentioned awareness campaigns as

one of the sources of information on PCa in the study area.

Knowledge on symptoms of PCa

This study also sought to find out from respondents, their knowledge of the common symptoms associated with PCa. Respondents were therefore asked to freely list the symptoms of PCa known to them. Table 4.7 shows their responses.

Table 5: Symptoms of PCa as listed by respondents

Symptoms of PCa known to Respondents	Frequency	Percentages
Pain during urination	103	27.9
Bloody urine or semen	95	25.8
Difficulty in urination	89	24.2
Difficulty emptying bladder	78	21.2
Frequent urination	74	20.1
Ever been screened for PCa (*n*=239)		
Yes	22	6.0
No	346	94.0

Table 5 shows that 27.9% identified pain during urination as a symptom of PCa. Similarly, large proportions of the respondents (25.8%; 24.2%, 21.2% and 20.1 %) identified bloody urine or semen, difficulty in urination, frequent urination and difficulty in emptying the bladder respectively. This shows that most of the members had low knowledge on the symptoms of PCa. The findings of this study are similar to the results of Ogundele and Ikuerowo (2015) who conducted an investigation among outpatients attending tertiary health care in Lagos, Nigeria, and found that majority of the participants had low knowledge regarding PCa.

In an interview with one of the key informants,

"Most patients who to some extent have come for check up or have personally called me since they don't want any other person to know about their penile problems have always mentioned an STI and most from my chemist come with a drug name in mind yet this has always turned out to be a symptom if checked properly." [Interview by Clinical Officer 9, on 17/9/2021]

Since most of the respondents associated the symptoms to STIs, this could be a reason as to why screening uptake is low. For instance, a study by Olapade-Olaopa (2014), on knowledge on perception of Nigerian men revealed that prostate cancer was confused with gonorrhea and stigma surrounding STIs has seen people use over the counter drugs to avoid embarrassment it comes with, yet what they are trying to treat could be PCa.

The study also found that approximately more than half (94.0%) of the respondents had not been screened of PCa. .The foregoing data reveals a variance between awareness and uptake of screening. While a significant proportion of the respondents demonstrated PCa awareness, through their knowledge of causes, symptoms and preventive measures, a very large proportion haven't been screened. This could be partly related to the fact that, as can be seen in Table 6, screening was identified by least number of respondents as one of the preventive measures for PCa. These screening rates are consistent with the study (Bugoye, Leyna, Moen, and Mmbaga, 2019) who similarly indicated that unwillingness to be checked or screened for PCa could also be due to the cost implication of the examination process and the poor attitude and low knowledge on the importance of early screening. A study in Oyo state, by Kolade, (2017) also found that most of the male population were unwilling to be screened for PCa because the examination might be costly amidst their meagre income level.

Respondents who confirmed to have undergone screening were asked to indicate the main reason that had prompted them to do so. The response was as shown in Table 6.

Table 6: Reasons for and against Screening

	Frequency	Percentages
Reasons for screening (n=22)		
To start early treatment	12	54.5
Pressure from friends	08	36.4
Out of curiosity	09	40.1
To get more information	08	36.3
Availability of free screening	06	27.3
Reason for not embracing screening (n=346)		
Lack of awareness	188	54.3
No screening service	219	63.3
Cultural beliefs	99	28.6
Negative perception	109	31.5
Cost of Screening	129	37.3

Out of the 22 respondents who confirmed to have undergone screening, more than one third (54.5%) indicated that they opted for screening to find cancer early for early treatment practice, 36.6% indicated to get more information on prostate cancer, 27.3% indicated that they decided to get screened because of the availability of free screening services at their disposal, 36.4% indicated pressure from their friends, while 40.1% indicated that they got test tested out of curiosity. From the findings, most of the respondents who had undergone screening could give reasons for opting to be screened, which could be linked with perceived disease risk, which are strong predictors of access to health services. Maladze, (2020) similarly in his study found a strong association between the perceived risk of prostate cancer and knowledge of prostate cancer and screening services with utilization of services.

Respondents who had not been screened for prostate cancer were also asked to indicate reasons for not getting screened. Table 6 indicates that majority (63.3%) of the respondents who had not been screened mentioned inaccessibility of screening services as their main reason. A significant proportion (54.3%) also identified lack of awareness on the availability of screening services as their main reason. Smaller proportions (31.5% and 28.6%) mentioned negative perception towards the cancer disease, and cultural beliefs

and perceptions respectively, as their reasons for not getting screened. Generally, most of the people who had not been tested or screened for prostate cancer cited inaccessibility of screening facilities and service, lack of awareness on the availability of free screening services and cost of screening.

Studies in Nigeria, Kenya and elsewhere in Africa have also found alarmingly low use of screening services for prostate cancer (Nakandi, et al., 2018; Steele et al., 2020; Pedersen, Armes and Ream, 2018; Weinrich et al., 2018). In all these studies, it was largely found that low utilization of prostate cancer screening have been associated with poor knowledge about prostate cancer, cost of screening and attitude towards screening.

4. CONCLUSIONS AND RECOMMENDATIONS
The study established that most of the respondents had heard about PCa, mainly from social media, TV, friends, and healthcare workers being the least. Most of the respondents also perceived STIs and Obesity factors to be the main causes of PCa. This conclusion was not quite encouraging as far as knowledge of PCa causal and risk factors is concerned, considering that only half the respondents could identify the risk factors associated with PCa. The study also concluded that those above 35 years had average chance of getting this cancer disease with significant amount above 55 years being at very high risk. Most of the respondents also had the knowledge on preventive measures for PCa, with majority mentioning less intake of red meat and dairy products and maintaining a healthy body weight as the top in the list of preventive measures of PCa. On knowledge on Symptoms of PCa, the study concluded that majority of the respondents had the knowledge on symptoms, mentioning pain during urination, bloody urine or semen, difficulty in urination, difficulty in emptying the bladder completely, and frequent urination. On screening uptake, there was low uptake of screening given that over three quarters of the respondents had not been screened of PCa. However, the few men who had been screened made the decision on the premise that screening helped them find cancer

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early for early treatment practice and to get more information on PCa. Low or poor uptake of screening was justified by inaccessibility of the screening services, lack of awareness on the availability of screening services, negative perception towards cancer disease and cultural beliefs and perceptions.

The study recommends the Ministry of Health at national and county levels, and cancer stakeholders to use multifaceted approaches on PCa to enhance informed shared decision making. It also recommends sensitization of clinicians through National Guidelines for Cancer Management on current PCa screening guidelines and to increase trained healthcare workers if at all there is demanding workload through Kenya National Cancer Control Strategy. It also recommends the need for health care workers to participate in increasing awareness with emphasis on risks and benefits of PCa. Empowering women on health education as they have been found to be of critical influence in the lives of men to spell myths and conceptions

Abbreviations
PC: Prostate cancer; ASR: Age-standardized rate; CHV: Community Health Volunteer; FGD: Focus Group Discussion; PSA: Prostate-specific antigen; DRE: Digital Rectal Examination.

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REFERENCES
1. American Cancer Society.(2017). Treatment of PCa 155–160. Retrieved on the 20th April, 2014 from http://www.ncbi.nlm.nih.gov/pmc/articles/PMC37288
2. Bidemi YO, and Oladimeji O, (2018) PCa awareness, knowledge, and screening practices among older men in Oyo State, Nigeria. Int Q Community Health Edu 30(3):271–286. https://doi.org/10.3322/caac.21492
3. Bray F, Ferlay J, Soejomataram I, Siegel R.L (2018) GLOBOCAN Estimates of Incidence and Mortality Worlwide for 36 Cancers in 185 Countries. CA: A Cancer Journal for Clinicians, 68,394-424
4. Bugoye, F.C., Leyna, G.H., Moen, K., Mmbaga, E.J (2019). "Knowledge, Perceived Risk and Utilization of PCa Screening Services among Men in Dar Es Salaam, Tanzania", PCa, vol. ID 2463048, 6 pages, 2019. https://doi.org/10.1155/2019/2463048
5. Chan, J. M., Gann, P. H., & Giovannucci, E. L. (2015). Role of diet in PCa development and progression. J Clin Oncol, 23(32), 8152-8160
6. Gelberg, L., Andersen, R. M., and Leake, B. D. (2010). The behavioral model for vulnerable populations: Application to medical care use and outcomes for homeless people. Health Services Research, 34(6), 1273-1302. PMCID: PMC1089079.
7. Globocan.(2008). Section of cancer information. International Agency for research on cancer. Accessed on the 6th September

from http://www-dep.iarc.fr

8. Kolade, O.A. (2017) Knowledge and Utilization of Prostate Cancer Screening Services among Male Civil Servants in Iseyin Local Government Area, Oyo State, Nigeria.

9. Mirzaei-Alavijeh, M., Ahmadi-Jouybari, T., Vaezi, M., & Jalilian, F. (2018). Prevalence, cognitive and socio-demographic determinants of PCa screening. *Asian Pacific journal of cancer prevention: APJCP*, *19*(4), 1041.

10. Ogundele SB, Omofade OT, Ayorinde M. (2017). Knowledge of PCa and attitude towards screening among male patients in Federal Teaching Hospital, Ado-Ekiti. Sch J Appl Med Sci. ;5(10B):3935-9.

11. Ogundele SO, and Ikuerowo SO. (2015). A survey of the awareness of PCa and its screening among men attending the outpatient clinics of a tertiary health center in Lagos, Nigeria. Niger J Surg.; 21(2):115-8. doi:10.4103/1117-   6806.162589 PMid:26425064 PMCid:PMC4566316

12. Ogundele, S.,O., and Ikuerowo S.,O.,(2015) A survey of the awareness of PCa and its screening among men attending the outpatient clinics of a tertiary health center in Lagos, Nigeria. Niger J Surg 2015;21:115-8

13. Ogundele, S.O, and Ikuerowo S.O. (2015). A survey of the awareness of PCa and its screening among men attending the outpatient clinics of a tertiary health center in Lagos, Nigeria. Nigerian Journal on Surgery; 21:115-8

14. Oladimeji O, Bidemi Y.O, Olufisayo J.A, Sola A.O. (2019). PCa awareness, knowledge, and screening practices among older men in Oyo state, Nigeria. Int Community Health Educ.;30 (3):271–86.

15. Olapada-Olaopa E, Owoaje E.T, Kola L, Ladipo M.M, Adebusoye L, Adedeji T.G (2014). Knowledge and Perception of Nigerian Men 40 years and above regarding prostate cancer

16. Otengah,W., Shivachi T. (2017). Socioeconomic determinants of maternal healthcare-seeking behaviour in the informal settlements of Nairobi: The case of Korogocho Slums, Nairobi.

17. Panigrahi G.K (2019). Exosome proteomic analyses identify inflammatory phenotype and novel biomarkers in African American prostate cancer patients

18. Tingen MS, Weinrich SP, Heydt DD, Boyd MD, Weinrich MC. (2018). Perceived benefits: a predictor of PCa screening. Cancer Nurse. ;21(5):349–57.

19. Wanyagah P. (2017). PCa Awareness, Knowledge, Perception on Self-vulnerability and Uptake of Screening among Men in Nairobi County, Kenya.http://ir-library.ku.ac.ke/handle/123456789/9005.

20. Weinrich, S. P., Greiner, E., Reis-Starr, C., Yoon, S., & Weinrich, M. (2018). Predictors of participation in PCa screening at worksites. *Journal of community health nursing*, *15*(2), 113-129.

21. Weinrich, SP (2016). PCa screening in high-risk men. African American hereditary PCa study network. Cancer.;106(4):796–803.Return to ref 25 in article

22. Weinrich, SP, Seger R, Miller BL, (2014). Knowledge of the limitations associated with PCa screening among low-income men. Cancer Nurs.;27(6):442–451.

23. WHO (2018): Estimated PCa incidences and prevalence in Africa: World Health Organization; International Agency for Cancer Research.

24. WHO (2019) IARC. GLOBOCAN 2018: Estimated cancer incidence, mortality, and prevalence worldwide in 2014, in: World Health Organization; International Agency for Cancer Research.

25. Wilson, K. M., & Mucci, L. A. (2019). Diet and lifestyle in PCa. *PCa*, 1-27.

26. World Health Organization. (2019). *World health statistics overview 2019: monitoring health for the SDGs, sustainable development goals* (No. WHO/DAD/2019.1). World Health Organization.

27. Yeboah-Asiamah, B., Yirenya-Tawiah, D., Baafi, D., & Ackumey, M. M. (2017). Perceptions and knowledge about PCa and attitudes towards PCa screening among male teachers in the Sunyani Municipality, Ghana. *African Journal of Urology*, *23*(4).

28. Zhu, C., Idemudia, C. U., & Feng, W. (2019). Improved logistic regression model for diabetes prediction by integrating PCA and K-means

29. techniques. *Informatics in Medicine Unlocked*, *17*, 100179.