Predictors of Uptake of Prostate Cancer Screening in Kenya: The Demographic Factors Influence

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Abstract: *Context:* Prostate cancer, an adenocarcinoma of the male prostate gland, is increasingly becoming a health burden among men in the world. In East Africa, prostate cancer ranks third in both incidence and mortality. Screening increases early detection and survival but there is no evidence to show that screening reduces mortality. *Aims:* This study sought to determine demographic predictors of uptake of prostate cancer screening among men aged 40 years and above. *Settings and Design:* The study was conducted in Kasarani Sub-County, Nairobi County, Kenya. Cross sectional descriptive survey methodology was adopted. *Methods and Material:* Both pretested questionnaire and interview guides were used for data collection. Interviews were conducted in the households sampled randomly. About 384 respondents were sampled from the population. *Statistical analysis used:* Inferential statistics (chi square tests and ANOVA tests) as well as basic descriptive statistics were employed in data analysis. Both quantitative (SPSS) and qualitative (MAXQDA) data analysis software were used for the analysis. All tests were conducted at 95% CI. *Results:* About 9% of the population had undertaken prostate cancer screening. Levels of education, age, religion and employment status influenced uptake of screening (p=0.000). *Conclusions:* There is low rate of uptake of prostate cancer screening in the study area. Demographic factors including religion, occupation, marital status, education and age influence uptake of prostate cancer screening.

Keywords: Screening, Prostate Cancer, Demographic Factors

1. Introduction

Prostate cancer (PC), an adenocarcinoma of the male prostate gland, is increasingly becoming a health burden among men in the world [1]. An estimated 0.9 million PC related cases and 0.26 million deaths attributable to PC occur annually in the world [2]. In East Africa, prostate cancer ranks third in both incidence and mortality, and leads to an estimated 9,000 (9% of all male cancer) cases and 7,300 (8.5% of all male cancer) deaths annually [3]. A study conducted by Kimani [4] in Kenya established that patients are diagnosed late with clinically advanced diseases underscoring the fact that PC screening is not a common practice in Kenya and patients go for it when the disease has already advanced. Screening and early detection is one of the most effective interventions for diagnosis and treatment of PC [5]. Screening for PC has been therefore recommended for men aged 40 and above [6, 7]. Health policies in Kenya have addressed PC screening to the extent of service availability [8, 9]. However, uptake of PC screening has been low as shown by several studies done in Kenya [3, 10]. There is therefore a need to develop innovative ways of increasing uptake of the PC screening for better health outcomes. Towards this end, this study was conducted to ascertain the demographic predictors of uptake of PC screening in Kenya.

2. Subjects and Methods

The study adopted descriptive cross sectional design. Both qualitative and quantitative methods of data collection and analysis were employed. Analytical approaches were used to establish relationship between variables. The study was conducted in Kasarani Sub-County in Kenya. It is in Nairobi county, Eastland area and covers an area of 586.4km^2 and the total population is 266,267. Study population comprised men aged 40 years and above. To arrive at the sample size, Fisher's et al, (1998) formula was used. Both qualitative and quantitative

data collection tools were used. Both descriptive statistics (Frequency and percentages) and inferential statistics (chi square tests and ANOVA tests) were used for data analysis. Qualitative data was analyzed through thematic analysis. Both qualitative and quantitative data analysis was assisted by computer software, NVIVO and SPSS version 23. Data is displayed in frequency distribution tables, bar charts, histogram, frequency polygons and pie chart to better understand data.

3. Results

3.1. Response Rate

The study targeted a sample size of 385respondents from which 385 filled in and returned the questionnaires making a response rate of 100%.

3.2. Demographic Characteristics of the Respondents

This section presents statistical analyses that relate to participant's bio data. Specifically the areas sought in this section include the participant's age category and highest level of education, occupation, marital status, religion, and area of residence. Participants were required to indicate their age category. This was sought in view of ensuring that the selected target group met the desired criteria, and ensure fitness in taking part in this survey. Table 1 below presents the demographic characteristics of the respondents.

Table 1. Demographic Characteristics of the respondents.

	Age group	Frequency	Percent
Age of Respondents	40-50	190	49.4
	51-60	151	39.2
	61-70	37	9.6
	71-80	6	1.6
	Above 80	1	0.3
Religion	Christian	363	94.3
	Muslim	1	0.3
	Traditional	6	1.6
	None/atheist	15	3.9
Marital Status	Married	335	87
	Single	10	2.6
	Widowed	11	2.9
	Separated	24	6.2
	Divorced	5	1.3
Occupation	Formal	14	3.6
	Business	228	59.2
	Casual work	139	36.1
	Farmer	4	1
	None	3	0.8
Levels of education	Primary	128	33.2
	Secondary	218	56.6
	Diploma	23	6
	University	9	2.3
	Non response	4	1

Out of 385 respondents 49.4% of the respondents were aged between 40-50 years, 39.2% of the respondents between 51-60 years, 9.6% of the respondents were aged between 61-70 years, 1.6% of the respondents were aged between 71-80 years whereas 0.3% of the respondents were aged above 80

years. The findings of this study show that most of the respondents 363 (94.3%) identified themselves as Christians, 15 (3.9%) identified themselves as atheist, 6 (1.6%) of the respondents affiliated themselves with to Africa Traditional religion whereas 1 (0.3%) of the respondents identified themselves as Muslims. This implies that most of the participants were Christians by faith a religion that in its teaching is not opposed to pilgrims in seeking health care services.

Results show that majority of the respondents 335 (87%) were married, 24 (6.2%) of the respondents indicated that they had separated with their spouses, 11 (2.9 %) were Widowed, 10 (2.6 %) were Single whereas 5 (1.3%) of the respondents indicated that they had divorced with their spouses. From the research findings, it's evident that majority of the respondent's 228 (59.2%) were involved in business activities, 139 (36.1%) of the participants worked as casual laborers 14 (3.6%) worked in white collar jobs (office) whereas 4 (1.0%) of the participants worked as famers from the findings, the study deduces that most respondents regardless of their occupation were in a position to spare time and even afford for cancer screening services.

Results show that majority of the respondents 56.6% (218) held secondary school education, 33.2% (128) of the respondents held Kenya primary certificates, 6.0% (23) of the respondents held college diploma certificates, 2.3% (9) of the respondents held bachelor's degree whereas 0.8% (3) had no formal education. These findings show that low literacy levels and to some extent this could have negatively influenced their commitment on healthcare seeking behaviour.

3.3. Prostate Screening Uptake

Respondents were asked to indicate whether they had ever been screened for prostate cancer. Figure 1 below presents the findings.
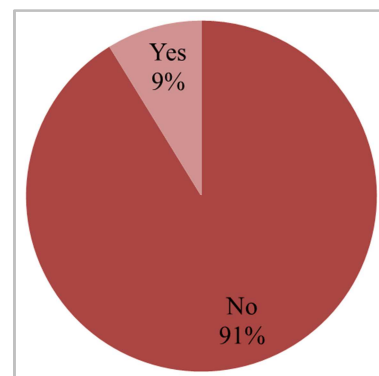

Figure 1. Uptake of screening services.

Results show that only 9% of the sampled respondents had participated in prostate cancer screening. Up to 91% of the respondents indicated they have never participated in prostate cancer screening. During the key informant interviews, it emerged that uptake of prostate cancer screening was very low. One of the healthcare providers indicated that'

Most men do not come for prostate cancer screening even if

a screening drive is organized. Very few of them come out to be tested despite the many awareness drives which are conducted by the ministries and other partners including the church. In most cases, you find that those who show up for screening are also health care workers or other people with wide knowledge on cancer treatment and care. There seems to be some phobia in most men (KII, No2).

3.4. Demographic Factors Associated with Uptake of Prostate Cancer Screening

Demographic factors tested against the uptake of PC screening included age, education, marital status, occupation and religion. Chi square tests were conducted to ascertain association between demographic factors and uptake of CP screening services. Odds Ratio was used to indicate the likelihood of occurrence. Table 2 below presents the demographic factors associated with uptake of PC screening.

***Table 2.** Demographic factors associated with uptake of PC screening.*

Variables		Prostate screening		OR (95 % CI)	P value
		Yes	No		
Age	40-50	8.3	91.7	1	
	51-60	10.4	89.6	0.8 (0.30-2.03)	
	61-70	16.2	83.8	0.5 (0.19-1.14)	0.0000
	71-80	25.4	74.6	0.3 (0.11-0.62)	
	Above 80	39.7	60.3	0.1 (0.06-0.31)	
Education	None	50	50	1	
	Primary	24.4	75.6	3.1 (1.70-5.65)	
	Secondary	12.1	87.9	7.3 (3.54-14.89)	0.005095
	Diploma	29.7	70.3	2.4 (1.32-4.23)	
	University	32	68	2.1 (1.20-3.78)	
Marital Status	Married	23.9	76.1	1	
	Single	2.1	97.9	14.6 (3.46-61.92)	0.0000
	Widowed	33.3	66.7	0.6 (0.34-1.17)	
	Separated	42.9	57.1	0.4 (0.23-0.77)	
Occupation	Formal	15.5	84.5	1	
	Business	25	75	0.6 (0.27-1.11)	
	Casual work	23.5	76.5	0.6 (0.29-1.21)	0.004412
	Farmer	37.5	62.5	0.3 (0.16-0.60)	
Religion	Christian	68.1	31.9	1	
	Muslim	12.3	87.7	15.2 (7.33-31.59)	
	Traditional	18.9	81.1	9.2 (4.76-17.61)	0.0000
	None/atheist	77.4	22.6	0.6 (0.33-1.17)	

As indicated in Table 2 above, demographic factors associated with uptake of CP screening included religion, occupation, marital status, education and age (p<0.05). About 91.7% of the respondents aged between 40-50 indicated that they had never participated in CP screening exercises. The trend of participation increased with age with those aged above 80 years presenting the least likelihood of not participating in CP screening exercises (OR=0.1, CI=0.06-0.31). With regards to levels of education, those with primary education had the highest proportion on those who had indicated that they never went for CP screening (87.9%, OR=7.3, CI=3.54-14.89). The trend reduced with the increasing levels of education with those with university education registering a 2.1 likelihood of missing CP screening services (CI=1.20-3.78).

About 42.9% of the respondents who indicated that they were married also indicated that they had participated in CP screening. However, only 2.1% of the respondents who indicated that they were single had participated in CP screening services. There was a 14.6 times likelihood of single respondents not participating in CP screening (CI=3.46-61.92). Those who were separated and widowed had a 0.4 and 0.6 times likelihood of not participating in CP screening as compared to those who indicated that they were married. Those with formal employment had the highest likelihood of not participating in CP screening with about 84.5% of them indicating that they did not participated in CP screening. Those whose economic activities were farming related had a 0.3 times likelihood of not participating in CP screening as compared to those with formal employment (CI=0.16-0.60). Finally, the study established that atheists/none religious respondents had the lowest likelihood of not participating in CP screening (OR=0.3, CI=0.33-1.17). Those who indicated that they were Muslims recorded the highest likelihood of not participating in CP screening (OR=15.2, CI=7.33-31.59). Table 2 above presents a summary of the findings.

From the Key Informant Interviews, it emerged that individual characteristics greatly influence uptake of CP screening services. The informants indicated that religion; levels of education and income were strong contributors to poor uptake of CP services. One of the respondents indicated that.

Some religious groupings activities do not encourage uptake of health services and especially if it touches on reproduction. Members of such religious groupings will thus not attend the screening services owing to their religious affiliations. We have also noted that most of the people who come for screening have high levels of awareness. This is only possible due to their high levels of education. It is very difficult for people without basic education to accept screening as health promoting behavior (KII, No 3).

Another informant also stated that;

People of lower economic status also tend to have more pressing challenges than PC screening. As such, I may say that economic status also influence uptake of CP screening services. If anything, people need to spend some money for transport and maybe lunch when they seek health services. Poor people may find it difficult to seek these services in as much as we are aware that government policies have made CP screening more accessible even to the poor. (KII, No2).

4. Discussion

4.1. Proportion ever Taken Prostate Cancer Screening

The findings of the study indicated that only 9% of the sampled respondents had participated in prostate cancer screening. Results from the Key Informant interviews also indicated possibility of very poor uptake of screening services in the study area. Taking the reported participation in PC screening as the proportion of uptake of PC screening, the findings of this study may lead to an understanding that there is very low uptake of PC screening in the study area.

According to Lee, Mallin [11], prostate cancer is the most diagnosed cancer among men but screening is not a common practice. Perhaps the findings of this study confirm the same assertion given the mere less than 10 % uptake rate established. This finding agrees with other studies conducted across the globe and in Kenya. For instance, the findings of a study conducted by Morias, Buckley [12] established poor uptake of PC screening in South Africa, Bray, Ferlay [13] in their Uganda study linking low uptake of PC screening the younger population of people with PC. In Kenya, a study by Erena, Shen [14] puts the uptake of PC screening in at 4% affirming the assertion by Ongala [15] that nearly all men in Kenya have not been tested for prostate cancer even if they are aware of the disease. The findings of this study also affirm the KDHS (2014) estimates that, only 3% of men had been tested for prostate cancer in Kenya.

The findings of this study seem to indicate a slightly higher proportion of men having taken the PC screening as compared to the KDHS (2014) figures as well as those of other scholars [14, 15]. Such differences can only be explained by the fact that this study was conducted in the urban area and with it the possibility of higher access of health care services as postulated by Parry, Davies [17].

While central boasts the highest awareness of prostate cancer in the country, only three per cent indicated they had been tested for the disease. While 72% per cent of men surveyed in Nyanza indicated they were aware of prostate cancer screening only about three per cent had been examined for it. In Eastern, 66% indicated they were aware of prostate cancer testing but only 4% tested for it at medical facility. In Western, while about 57% of men, aware of prostate cancer less than one percentage indicated they had been examined for the condition. In the Rift Valley region, less than two per cent of men surveyed indicated they had been examined for prostate cancer. North Eastern is the only region in the country where men have more knowledge about prostate cancer [16]. Theoretically, this finding can be understood in the context of existence of barriers and enablers in the study area. There could be barriers explaining the low uptake of PC screening in the study area as explained in the subsequent sections of this chapter.

4.2. Demographic Factors Associated with Uptake of Prostate Cancer Screening

The study established that demographic factors associated with uptake of CP screening included religion, occupation, marital status, education and age. Elderly respondents were found to be more likely to participate in CP screening. It can thus be understood that age of the respondents in the study area influenced uptake of PC services and that younger men were less likely to participate in PC screening. According to Sujatha [18], health seeking behaviour tend to vary with the age of an individual. However, the findings of this study are not in agreement with those of the younger people who are more likely to seek medication as compared to the elderly men. It can be reasoned that since risks of PC increased by age [20, 21], younger men in the study area could have been

with the perception that they were less susceptible to PC. According to proponents of the Health Belief Model, one of the cues of health seeking behavior is perceived susceptibility [19, 22].

The study also established that respondents from the Islamic faith were less likely to participate in PC screening. Those with no religion/ Buddhists were more likely to undergo PC screening. This finding leads to an understanding that religious affiliation influence uptake of PC screening. This finding is in agreement with the those of Vahabi, Lofters [23] who established poor uptake of cancer screening among Muslim women and concluded that there were religious restrictions to the extent of the procedures conducted on women. The same reasoning can be advanced with regards to the findings of this study to the effect that religion is could be a psychological determinant of uptake of PC screening from a theoretical point of view.

The findings of the study also established higher uptake of CP screening among respondents with formal employment. Formal employment is associated with better income and stable earnings [24]. It can thus be reasoned that nature of employment influence uptake of PC screening services. According to Pinto and Bloch [25], income status has also been established to be a determinant of access to health services [25]. Literature provides conflicting findings with regards to the influence of socio-economic status on uptake of PC screening. In a study conducted by Friedlander, Meyer [26], respondents in higher economic groupings were more likely to have had a PSA test were those who were unemployed. On the other hand, according to a study conducted by Everist, Howard [27], people with low socio-economic status (SES) are more likely not to undergo prostate cancer screening than with a higher (SES) [27]. Based on the findings of this study, it can be reasoned that that the funds needed for test related expenses played a role in access to such services. This position is also supported by Patel, Gishe [28] who established associations between obstacles to screening (such as cost and transportation) and uptake of PC screening.

With regards to marital status, the study established that respondents who were single were less likely to participate in PC screening. This finding may lead to an understanding that marital status influence uptake of PC screening in the study area. According to McGinley, Tay [29], marital status of an individual may influence uptake of PC screening. This finding is in agreement with the findings of the study conducted by Bello, Buhari [30] that marital status was a significant factor in uptake of PC screening. While other studies have demonstrated the significance of spousal support in uptake of cancer screening in the case of female participants, the findings of this study provides evidence that single men with no spousal support also did not utilize cancer screening services. This finding can also be explained by the fact that single men in the study could have also been those of younger ages and thus poor uptake of PC screening as demonstrated in the earlier sections of this chapter.

The role of levels of education as socio-demographic

determinant of uptake of PC screening in this study was not clear. While it was expected that uptake of PC screening could increase with increasing levels of education, those with secondary school levels of education had the highest likelihood of not participating in PC screening as opposed to their counterparts with primary and no education. Chances of participation in PC screening however, improved with college through university education. While there was a significant relationship between levels of education and uptake of PC screening, available literature seems to provide evidence for perfect linear associated between levels of education and uptake of PC screening [11, 31]. The association between levels of education and uptake of PC screening is explained by the fact that education is viewed as a factor improving awareness and thus uptake of PC screening [10].

5. Conclusion

From the findings as presented in chapter four above, the study concludes that there is low rate of prostate cancer screening among men aged above 40 years in the study area. Individual willingness to seek cancer screening services is seen to decrease with the increase in age. The study also points out at participants' low knowledge on prostate cancer and its growth stages. Fear of the unknown is found to be one of the most leading factors as to why many people were unwilling to get screened for prostate cancer.

Further conclusions are made to the effect that age, level of education, marital status, economic status, family history and hereditary factors influenced the uptake of prostate cancer screening among men aged above 40 years in the study area. And that perception towards prostate cancer screening, such as susceptibility, severity, benefits, stimulus and confidence also contributed to the low up take rate.

References

[1] Dy GW, Gore JL, Forouzanfar MH, Naghavi M, Fitzmaurice CJEu. Global burden of urologic cancers, 1990–2013. 2017; 71: 437-46.

[2] Ferlay J, Colombet M, Soerjomataram I, Mathers C, Parkin D, Piñeros M, et al. Estimating the global cancer incidence and mortality in 2018: GLOBOCAN sources and methods. 2019; 144: 1941-53.

[3] Wachira BW, Meng'anyi LW, Mbugua GR. Knowledge, perception and uptake of prostate cancer screening: A cross sectional study at a level III hospital in Kenya. 2018.

[4] Kimani KN. Experiences of patients living and dying with advanced heart failure in Kenya: a qualitative serial interview study. 2017.

[5] Litwin MS, Tan H-JJJ. The diagnosis and treatment of prostate cancer: a review. 2017; 317: 2532-42.

[6] Grossman DC, Curry SJ, Owens DK, Bibbins-Domingo K, Caughey AB, Davidson KW, et al. Screening for prostate cancer: US Preventive Services Task Force recommendation statement. 2018; 319: 1901-13.

[7] Frånlund M, Arnsrud Godtman R, Carlsson SV, Lilja H, Månsson M, Stranne J, et al. Prostate cancer risk assessment in men with an initial PSA below 3 ng/mL: results from the Göteborg randomized population-based prostate cancer screening trial. 2018; 52: 256-62.

[8] Huchko MJ, Kahn JG, Smith JS, Hiatt RA, Cohen CR, Bukusi EJBc. Study protocol for a cluster-randomized trial to compare human papillomavirus based cervical cancer screening in community-health campaigns versus health facilities in western Kenya. 2017; 17: 826.

[9] Makau-Barasa LK, Greene S, Othieno-Abinya N, Wheeler SB, Skinner A, Bennett AVJHRP, et al. A review of Kenya's cancer policies to improve access to cancer testing and treatment in the country. 2020; 18: 1-10.

[10] Mutua K, Pertet AM, Otieno CJBph. Cultural factors associated with the intent to be screened for prostate cancer among adult men in a rural Kenyan community. 2017; 17: 894.

[11] Lee DJ, Mallin K, Graves AJ, Chang SS, Penson DF, Resnick MJ, et al. Recent changes in prostate cancer screening practices and epidemiology. 2017; 198: 1230-40.

[12] Morias S, Buckley E, Beckmann K, O'Callaghan M, Borg M, Short MJR, et al. Variation in radiotherapy patterns of care in the radical treatment of South Australian men with non-metastatic prostate cancer between 2005–2015. 2020; 145: 138-45.

[13] Bray F, Ferlay J, Soerjomataram I, Siegel RL, Torre LA, Jemal AJCacjfc. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. 2018; 68: 394-424.

[14] Erena AN, Shen G, Lei PJEJoCP. Prostate cancer awareness and screening practice among Kenyan men. 2020; 29: 252-8.

[15] Ongala MO. The Nexus Between Participatory Communication And Prostate Cancer Screening Among At-Risk Population In Westlands, Nairobi–Kenya: University of Nairobi; 2018.

[16] Demographic K. Health Survey (2014 KDHS). 2014.

[17] Parry L, Davies G, Almeida O, Frausin G, de Moraés A, Rivero S, et al. Social vulnerability to climatic shocks is shaped by urban accessibility. 2018; 108: 125-43.

[18] Sujatha VJSB. What Is the Sociology behind Health Status and Health-seeking Behaviour? 2017; 66: 286-301.

[19] Ciarrochi J, Wilson CJ, Deane FP, Rickwood DJCPQ. Do difficulties with emotions inhibit help-seeking in adolescence? The role of age and emotional competence in predicting help-seeking intentions. 2003; 16: 103-20.

[20] Mustafa M, Salih A, Illzam E, Sharifa A, Suleiman M, Hussain SJIJoD, et al. Prostate Cancer: Pathophysiology, Diagnosis, and Prognosis. 2016; 15: 122-6.

[21] Zhou CK, Check DP, Lortet-Tieulent J, Laversanne M, Jemal A, Ferlay J, et al. Prostate cancer incidence in 43 populations worldwide: an analysis of time trends overall and by age group. 2016; 138: 1388-400.

[22] Mincey K, Turner BL, Anderson K, Maurice S, Neal R, White CJJoch. Prostate Knowledge, Attitudes and Beliefs in Black College Men: A Qualitative Study. 2017; 42: 1096-101.

[23] Vahabi M, Lofters A, Kim E, Wong JP-H, Ellison L, Graves E, et al. Breast cancer screening utilization among women from Muslim majority countries in Ontario, Canada. 2017; 105: 176-83.

[24] Nordman CJ, Rakotomanana F, Roubaud FJWD. Informal versus formal: A panel data analysis of earnings gaps in Madagascar. 2016; 86: 1-17.

[25] Pinto AD, Bloch GJCFP. Framework for building primary care capacity to address the social determinants of health. 2017; 63: e476-e82.

[26] Friedlander DF, Meyer CP, Choi K, Cole AP, Hanske J, Zavaski M, et al. A Nationwide Survey of Prostate Specific Antigen Based Screening and Counseling for Prostate Cancer. 2017; 4: 210-7.

[27] Everist MM, Howard LE, Aronson WJ, Kane CJ, Amling CL, Cooperberg MR, et al. Socioeconomic status, race, and long-term outcomes after radical prostatectomy in an equal access health system: Results from the SEARCH database. Urologic Oncology: Seminars and Original Investigations; 2019: Elsevier.

[28] Patel K, Gishe J, Liu J, Heaston A, Manis E, Moharreri B, et al. Factors Influencing Recommended Cancer Screening in Low-Income African American Women in Tennessee. 2020; 7: 129-36.

[29] McGinley KF, Tay KJ, Moul JWJNRU. Prostate cancer in men of African origin. 2016; 13: 99.

[30] Bello JO, Buhari T, Mohammed TO, Olanipekun HB, Egbuniwe AM, Fasiku OK, et al. Determinants of prostate specific antigen screening test uptake in an urban community in North-Central Nigeria. 2019; 19: 1665-70.

[31] Watson CA, Nilam SJJDST. Educational level as a social determinant of health and its relationship to periodontal disease as a health outcome. 2017; 1: 8-11.