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Original Research Article

Prostate cancer knowledge and screening practices among men from Tharaka Nithi County, Kenya

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ABSTRACT

Background: Prostate cancer (PCa) is the second most commonly diagnosed cancer and the fifth leading cause of cancer death among men. In Kenya it is the leading male cancer (21.9%) followed by colorectal cancer (8,3%). It is amenable if detected early. Knowledge on prostate cancer and its screening practices are some of the predictors associated with early diagnosis and treatment. The purpose of this study was to determine PCa knowledge levels and screening practices among men from Tharaka Nithi County in Kenya.
Methods: Cross-sectional study design was adopted and multi-stage sampling was used eventually recruiting 382 men who were 40 years old and above. Researcher administered questionnaires were used to collect data. Data analysis was done using the statistical package of social science (SPSS) version 22.
Results: Awareness level of prostate cancer was high (85.1%) among participants. Majority of the participants (69.1%) had poor knowledge and screening levels were low (4.5%). Factors found to be significantly associated with PCa knowledge were prostate cancer awareness ($p=0.022$), awareness on PCa screening tests ($p<0.001$) and family history of PCa ($p<0.001$), while those found to be significantly associated with screening were level of education ($p=0.001$), awareness of PCa screening tests ($p<0.001$), family history of PCa ($p=0.012$) and knowledge on PCa ($p=0.044$).
Conclusions: Knowledge on PCa and PCa screening services were low among men in Tharaka Nithi County and therefore there is need for the County government to come up with strategies aimed at increasing the level of knowledge on PCa and scaling up of PCa screening services.

Keywords: Prostate cancer, Knowledge, Screening

INTRODUCTION

Prostate cancer (PCa) is the second most commonly diagnosed cancer after lung cancer and the fifth leading cause of cancer death among men, with an estimated 1.5 million new cases and 397,000 deaths worldwide in the year 2022.[1] Its incidence rates vary from one part of the world to another. The lowest incidence rates have been reported in Asian continent (about 11.5 cases per 100,000) while the highest number of new cases per year have been reported in Oceania and North America (79.1 and 73.9 cases per 100,000 people respectively).[2] There are striking differences in prostate cancer incidence and mortality rates across racial and ethnic groups. In the USA, Black or African American men are 1.7 times more likely to be diagnosed with PCa than White men and 2.1 times more likely to die of the disease.[3]

Prostate cancer was the most common cancer diagnosed among African men and was also the leading cause of cancer related death among African men in 2020 according to World Health Organization (WHO).[4] GLOBOCAN

database for the year 2020, showed that, prostate cancer was the most commonly diagnosed cancer in Sub Saharan Africa, with 77,300 cases, followed by liver cancer with 24,700 cases, and colorectal cancer with 23,400 cases.[5] Incidence rates of PCa in Africa have been on increase and some of the reasons attributed to this increase are better awareness of the disease, improvements in healthcare systems, and wider use of prostate specific antigen (PSA) testing.[6] The fact that Africa carries one of the highest PCa mortality rates also raises concern. Prostate cancer incidence and mortality projections for Africa paints a grim picture for the region with both expected to increase by over 120% by the year 2040.[2]

In Kenya, cancer is the third commonest cause of death after infectious diseases, and cardiovascular diseases.[7] The incidence of cancer has been on increase in the country. According to GLOBOCAN estimates, the annual incidence of cancer in the country increased from 42,116 in 2020, to 44,726 in 2022.[7] The five commonest cancers in Kenya in order of prevalence are breast, cervical, prostate, esophageal, and colorectal. Prostate cancer is the leading cancer among men (21.9%), followed by colorectal cancer (8,3%) and then esophageal cancer (8%).[6] Besides having high prevalence rates of cancer in Kenya, the biggest challenge is low rates of testing and late diagnosis. According to Kenyan regional cancer registry based in Nairobi, most cancer cases in the country are diagnosed at advanced stages, resulting in a less favorable prognosis.[8]

The purpose of prostate cancer screening is to detect cases of prostate cancer before any clinical symptoms appear. Research shows that screening for prostate specific antigen (PSA) can identify prostate cancer in its early stages.[9] The United States Preventive Services Task Force in 2018 recommended that, for men aged 55 to 69 years, the decision to undergo periodic PSA-based screening for prostate cancer should be an individual one and should include discussion of the potential benefits and harms of screening with their clinician.[10] Given the increased PCa incidence and mortality rates for Black men in the USA, some groups suggest annual screening starting at age 40 years for these men.[11] In Kenya, the Ministry of health recommends screening of men who are 40 years and above, they should be well informed on benefits and risks of testing and discourages organized mass screening.[12]

Screening levels for PCa remains low in many regions of the world especially in the developing world. Disparities in screening by race and ethnicity have also been persistent and are notable in USA. A study carried out in the US found that there was a large disparity in PSA testing frequency by participant self-identified race and ethnicity, whereby non-Hispanic Black men and non-Hispanic multiracial men were less likely to receive PSA tests as compared to non-Hispanic White men.[13] In Sub-Saharan Africa testing rates have been consistently low though the trend is changing with some studies showing progressive increase in testing in a number of countries over the last two decades.[14] A recent study carried out in Dare Salam Tanzania, reported only 7.7% of the study participants had been screened for PCa.[15] In Kenya, screening rates are not any better, a study carried out in Nairobi found only 4.1% of the participants had been screened, while a more recent study carried out in Central Kenya found only 5% of the participants had been screened.[16,17]

A number of studies have been carried out on barriers and factors that could be leading low levels of prostate cancer screening. One of the main factors found to be associated with low levels of screening is level of knowledge on prostate cancer. A study carried out involving seven Sub Saharan countries on barriers to PCa screening among men in Sub-Saharan Africa found low levels of education, lack of PCa knowledge and low sociolect-economic status to be some of the factors hindering PCa testing.[18] A study in Central Kenya found lack of knowledge on prostate cancer, fatalistic beliefs, low risk perception, stigma, and male dominance factors as some of the main factors hindering PCa screening and testing.[17] Where people are knowledgeable about a disease condition and its risk factors, they are more likely to take precautionary measures against the disease and are likely to seek early diagnosis and treatment of the disease.

METHODS

Study design

Cross-sectional study design was used involving men aged 40 years and above who were eligible for PCa screening as per the Kenyan ministry of health prostate cancer screening guidelines.[11]

Study area

The study was carried out in Tharaka Nithi County which is located in the Eastern region of Kenya. The County lies within the Geo codes 0°18′S 38°0′E and covers an area of 2564.4 km^2.

The primary economic activity in the County is farming with farmers in the high attitude areas growing tea and coffee while those in the lower areas grow sorghum, maize, green grams and millet. Dairy farming and fish farming are also practiced in some areas. The County is served by one county referral hospital, four other big hospitals, a number of health centers and dispensaries. Prostate cancer is the most prevalent male cancer in the County at 10.2% followed by esophageal cancer.[19]

Sample size determination

This was a part of a bigger intervention study looking at the effects of education intervention on PCa knowledge and screening practices so the formula used for sample size determination was the one given by Charan and Biswas.[20] Considering 5% margin of error, 95% confidence intervals and a non-response of 10%, the final calculated sample size was 382 participants.

Sampling

Multi-stage sampling was carried out. Since Tharaka Nithi has six sub-counties, the Sub counties were taken as clusters and four clusters (sub counties) were selected using simple random sampling as study sites. The clusters (sub-counties) selected were Mwimbi, Chuka, Muthambi and Tharaka South. From each of the four sub counties, 2 Community units were selected randomly making a total of 8 community units. A list of households with men who met the selection criteria, was then developed in each of the selected community units. Inclusion criteria for participants was men aged 40 years and above from the sampled areas who were willing to participate in the study. The study excluded adult males who were either mentally or physically sick at the time of study. Systematic random sampling was then used to select 48 participants per community unit making a total of 384 men.

Data collection

Data was collected by the researcher and trained assistants using structured researcher-administered questionnaire. The questionnaire had four parts. The first part of the questionnaire collected demographic data, the second part collected data on awareness of prostate cancer and family members with Prostate cancer. The third part collected data on knowledge of prostate cancer (both general knowledge and knowledge on risk factors). The last part collected data on prostate cancer screening/testing practices. This questionnaire was a modification of a questionnaire designed and used by Wienrich et al in their study.[21] Data was collected on October and November 2022.

Data analysis

Data was entered, cleaned, and analyzed using the statistical package of social sciences version 22 (SPSS Armonk, NY: IBM Corp). Demographic data and levels of awareness of prostate cancer were analyzed and presented as computed percentages. Chi-square and Fishers exact tests were used to test significance of association between independent variables (demographic variables, level of awareness on PCa, and family members with PCa) and dependent variables (knowledge on PCa and screening practices). Those variables that were found to be significant ($p<0.05$) were further analyzed using logistic regression.

RESULTS

Sociology-demographic characteristics of the respondents

A total of 382 men participated in the study representing response rate of 99.4%. Majority of the participants, 58.6% were aged between 40 to 59 years. Most of them 74.6% were married, 47.6% had attained at least primary level education while 64.4% were employed. Other characteristics are shown in Table 1.

Table 1: Socio-demographic characteristics of study participants.

Characteristic	Population (n=382)	Percentage
Age (years)		
40-59	224	58.6
50 years and above	158	41.4
Marital status		
Married	285	74,6
Not married	97	25.4
Education level		
Up-to primary	182	47.6
Secondary	125	32.7
Post-secondary	75	19.7
Employment status		
Employed	246	64.4
Not employed	136	35.6
Religion		
Catholic	122	31.9
Protestants	237	62.0
Others	23	6.0

Awareness of prostate cancer

Majority of the study participants, 85.1% had heard about prostate cancer and the most common source of information cited was media at 37.8% (radio and television) followed by health workers at 32.2%. Out of 69.6% who had ever heard of prostate cancer screening, only 16,8% were aware of the specific screening tests used in screening for PCa. PSA test was mentioned by majority of the participants (45.3%) as the test they were aware of, followed by digital rectal exam at 37.5%. Only 14.4% of the participants had family history of prostate cancer. Table 2 below summarizes these findings.

Knowledge on prostate cancer

The participants were taken through a series of 15 questions to test their knowledge on prostate cancer. For each of the 11 questions a correct response was given score of 1 and wrong response was given score of 0. The participant scores varied from 2-13 points and was classified into 2 levels using Bloom's cut off point: good knowledge (9-15 correct answers or score of 60% and above), and poor knowledge (8 correct answers or below or score of 59% and below).

Majority of the participants (69.1%) had poor knowledge, with the remaining 30.9% having good knowledge. The mean score was 49.8%. Table 3 below summarizes the performance on individual questions. The best performed question was the question on prostate cancer being the commonest male cancer with 76.7% (293) of the participants answering correctly while the worst performed question was question on race being a risk factor to prostate cancer with only 11.8% of the participants getting it right.

Prostate cancer screening practices

Only 4.5% of all the participants had been screened for prostate cancer. Majority of those screened 64.7% had gone through PSA screening test and the main reason given for screening was either because the participants was not feeling well or doctor recommended screening for whatever reason (82.3%). Table 4 below summarizes some of these key findings.

On cross tabulation (Table 5), variables found to be significantly associated with prostate cancer knowledge included awareness of prostate cancer (p=0.022), awareness of prostate cancer screening tests (p<0.001), family history of prostate cancer (p=0.001) and screening practices (p=0.044). On the other hand, prostate cancer screening was found to be significantly associated with education level (p=0.001), awareness of prostate cancer screening tests (p<0.001) and family history of prostate cancer (p=0.012).

Table 2: Awareness of prostate cancer.

Variable and category (n=382)	Frequency
Ever heard of prostate cancer	
Yes	325 (85.1)
No	57 (14.9)
Source of information	
Media (radio and television)	144 (37.8)
Newspaper	13 (3.4)
Friends	45 (11.8)
Health workers	123 (32.2)
Ever heard of prostate cancer screening	
Yes	266 (69.6)
No	116 (30.4)
Awareness of specific prostate cancer screening tests	
Yes	64 (16.8)
No	318 (83.2)
Prostate cancer screening method	
PSA screening	29 (45.3)
Digital rectal exam	24 (37.5)
Ultrasound	11 (17.2
Family history of prostate cancer	
Yes	55 (14.4)
No	327 (85.6)

Table 3: Knowledge on prostate cancer.

S. no.	Questions on knowledge about prostate cancer	Participant who answered correctly (n=382)	Percentage
1	Prostate cancer (PCa) is the commonest type of male cancer	293	76.7
2	One can have PCa with no signs or symptoms	226	59.2
3	Nocturia is a sign of PCa	140	36.6
4	Low back pain is a symptom of PCa	135	35.3
5	One can have PCa without knowing	236	61.8
6	PCa is only curable when diagnosed early	106	27.7
7	Tests are only necessary when one has s &s of PCa	217	56.8
8	Urine control is affected by some PCa treatment modalities	167	43.7
9	Some PCa treatment modalities affect sex	222	58.1
10	PCa is a serious disease that can kill	271	70.9
11	Doctors can predict PCa treatment outcome before treatment	216	56.5
12	Family is a risk factor to prostate cancer	160	41.9
13	Race (being black) is a risk factor to prostate cancer	45	11.8
14	Fatty diet is a risk factor to prostate cancer	142	37.2
15	Age is a risk factor to prostate cancer	279	73
	Overall knowledge level	Good	118 (30.9)
		Poor	264 (69.1)

Table 4: Prostate cancer screening practices.

Variables and category	Frequency
Screened for prostate cancer	
Yes	17 (4.5)
No	365 (95.5)
Method of screening	
PSA testing	11 (64.7)
Digital rectal examination	2 (11.8)
Biopsy	4 (23.5)
Reason for screening	
Not feeling well/doctor's recommendation	14 (82.3)
Heard from media	2 (11.8)
Encouraged by friend	1 (5.9)
Is prostate cancer screening beneficial	
Yes	364 (95.3)
No	18 (4.7)

Table 5: Association between different variables and knowledge and prostate cancer screening.

Variables	Knowledge		Statistics Chi square	Prostate cancer screening		Statistics - Chi square/ Fisher's exact test
	Good (%)	Poor (%)		Yes (%)	No (%)	
Age (years)						
40-59	67 (17.5)	157 (41.1)	X^2=243, df=1, p=0.654	7 (1.8)	217 (56.8)	X^2=2.237, df=1, p=0.135
60-above	51 (13.4)	107 (28.0)		10 (2.6)	148 (38.7)	
Education level						
Up-to primary	59 (15.4)	123 (32.2)	X^2=0.731, df=2, p=0.694	6 (1.6)	176 (46.1)	X^2= 13.011, df=2, p=0.001 (Fisher's exact test)
Secondary	35 (9.2)	90 (23,6)		2 (0.5)	123 (32.2)	
Post-secondary	24 (6.3)	51 (13.4)		9 (2.4)	66 (17.3)	
Employment status						
Employed	77 (20.2)	169 (44.2)	X^2=0.055, df=1, p=0.815	14 (3.7)	232 (60.7)	X^2=2.502, df=1, p=0.128 (Fisher's exact test)
Not employed	41 (10.7)	95 (24.9)		3 (0.8)	133 (34.8)	
Awareness of PCa						
Yes	108 (28.3)	218 (57.1)	X^2=6.342, df=1, p=0.022	16 (4.2)	310 (81.2)	X^2=1.145, df=1, p=0.487 (Fisher's exact test)
No	10 (2.6)	46 (12)		1 (0.3)	55 (14.4)	
Awareness of PCa screening tests						
Yes	32 (8.4)	32 (8.4)	X^2=13.152, df=1, p<0.001	16 (4.2)	47 (12.3)	X^2=77.844, df=1, p<0.001 (Fisher's exact test)
No	86 (22.5)	232 (60.7)		1 (0.3)	318 (83.2)	
Family member with PCa						
Yes	28 (7.3)	27 (7.1)	X^2=12.062, df=1, p=0.001	6 (1.6)	49 (12.8)	X^2=6.303, df=1, p=0.012
No	90 (23.6)	237 (62)		11 (2.9)	319 (83.5)	
Screened for PCa						
Yes	9 (2.4)	8 (2.1)	X^2=4.052, df=1, p=0.044			
No	109 (28.6)	256 (67)				

DISCUSSION

This study assessed the level of knowledge and PCa screening practices among men aged 40 years and above from a rural setting Tharaka Nithi County. Majority of the participants had poor knowledge on PCa and could not identify some of the common signs and symptoms of PCa. Given that PCa cases are on increase in Kenya, this finding is worrying and demonstrates that more needs to be done to ensure men are more knowledgeable on this condition.[7]

This finding is not peculiar to Kenya, a number of related studies carried out in Sub Saharan Africa have come up with similar findings. A study conducted in Northern Tanzania on prostate cancer knowledge and barriers to screening found only 20.4% of all the participants had good knowledge.[22] Other recent studies carried out in Uganda and Nigeria posted similar findings.[23,24]

The awareness level of PCa was high in this study as majority of the participants (85.3%) had heard of PCa. This clearly indicates that awareness may not necessarily

translate to knowledge. This could be explained by the main source of information, which in this case was media (radio and television). Media is good in sensitization but may not give details that a health care provider can give when seated with a client. This finding of high levels of awareness was consistent with findings of studies carried out in Rwanda et al found that 80% of the study participants were aware of PCa and another study carried out recently in Central Kenya that found 84% of the participants had heard about PCa.[17,25]

In this study, we found that the PCa screening levels were very low as only 4.5 % of the participants had been screened. This study finding is congruent with the findings of another study carried out in rural parts of Central Kenya that found only 5% of the participants had been screened.[17] This trend in Kenya is worrying given the high prevalence rate of PCa.[7] These low levels of screening can be attributed to poor knowledge of the disease, low levels of awareness of PCa screening tests and unavailability of screening services especially in rural areas. Studies carried out in other African countries have equally demonstrated low levels of PCa testing ranging from 3% to 10%. Recent studies carried out in Tanzania, Ethiopia and South Africa showed testing rates of 9.5% 7.2% and 3.3% respectively.[22,26,27]

Testing rates may differ within the country according to population under study and depending on level of exposure to prostate cancer knowledge and services. A study by Opondo et al among male health care providers in Western Kenya found 27% PCa screening rate which is higher than the rates reported among general population, but never the less this was considered low level of screening given that the participants were health professionals who are more knowledgeable on PCa and have better access to screening services.[28]

Factors found to be significantly associated with PCa knowledge in our study were awareness on PCa, awareness of PCa screening tests and family history of PCa. This could be as a result of those aware of PCa and having family members with PCa being more inquisitive and therefore finding more about the disease than those not aware. Those with family members with PCa also interact more with health workers and are therefore likely to be more knowledgeable on PCa. Factors found to be associated with PCa screening were level of education, awareness of PCa screening tests, family history of PCa and knowledge on PCa.

Some studies carried out elsewhere in Africa have also identified these factors to be associated with uptake of screening services. Studies carried out recently in Tanzania, Nigeria and Western Kenya found education level and knowledge on PCa to be positively associated with PCa screening.[15,24,28] Having family history of PCa have also been observed to have positive association with PCa screening in Uganda and Jordan.[23,29]

Limitations

The study had several limitations. This being a cross-sectional study, association of dependent and independent variables could not be clearly explained. The other limitation was data was collected by self-report which was prone to misreporting and recall bias especially among the aged men. The study was also conducted in the rural settings and therefore the findings may not be representative of men in urban setting.

CONCLUSION

Findings from this study demonstrated poor knowledge of PCa and low uptake of screening services. Awareness level of PCa was very high and the main source of information was media. Education level, awareness of screening tests, family history of PCa and knowledge on PCa were the factors found to be significantly associated with PCa screening. Based on these findings, the study recommends that the government needs to come up with strategies aimed at increasing the level of knowledge on PCa in the rural areas which may in-turn improve the uptake of screening services. There is also need to scale up PCa screening services at the community level so as to enable early diagnosis and treatment.

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REFERENCES

1. Bray F, Laversanne M, Sung H, Ferlay J, Siege R, Soerjomataram I, et al. Global cancer statistics 2022: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA Cancer J Clin. 2024;74:229-63.
2. Ferlay J, Lam F, Colombet M, Mery L, Pineros M, Znaor A, et al. Global cancer observatory: cancer today. Lyon, France: International Agency for Research on Cancer. 2019.
3. Siegel RL, Miller KD, Fuchs HE, and Jemal A. Cancer statistics. CA Cancer J Clin. 2022;2:7-33.
4. Ferlay J, Ervik M, Lam F. South Africa. In: Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. 2020. Available at: https://cansa.org.za/files/2021/02/

IARC Globocan-SA-2020-Fact-Sheet. Accessed on 07 November 2024.
5. Bray F, Parkin D. Cancer in sub-Saharan Africa in 2020: a review of current estimates of the national burden, data gaps, and future needs. Lancet Oncol. 2022;23(6):719-28.
6. Sung H, Ferlay J, Siegel R, Laversanne M, Soerjomataram I, Jemal A, et al. Global cancer statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. 2021. CA Cancer J Clin. 2021;71(3):209-49.
7. Ministry of Health Kenya. The National Cancer Control Strategy (2023–2027). Available at: http://www.health.go.ke. Accessed on 12 May 2025.
8. Cancer Incidence report (2009-2013); Nairobi. Cancer Registry. Available at: http://www.kemri. go.ke>cancer-registry. Accessed on 18 February 2025.
9. Carlsson S, Godtman R, Pihl CG, Vickers A, Lilja H, Huggoson J, et al. Young age on starting prostate-specific antigen testing is associated with a greater reduction in prostate cancer mortality: 24-year follow-up of the Göteborg randomized population-based prostate cancer screening trial. European Urol. 2023;83:103-9.
10. United States Preventive Services Task Force (USPSTF). "Recommendation: Prostate Cancer: Screening United States Preventive Services Advances in Preventive Medicine 7 Task-force." 2018. Available at: https://www.uspreventive servicestaskforce. org/uspstf/recommendation/ prostate-cancer-screening. Accessed on 18 February 2025.
11. Nyame Y, Gulati R, Heijnsdijk E, Tsodikov A, Mariotto A, Gore J, et al. The impact of intensifying prostate cancer screening in Black men: a model-based analysis. J Natl Cancer Inst. 2021;113:1336-42.
12. Ministry of Health. National-Cancer-Screening-Guidelines. 2018. Available at: https://www.health. go.ke/wpcontent/uploads/2019/02/National-Cancer-Screening Guidelines-2018.pdf. Accessed on 18 February 2025.
13. Morley F, Iyer H, Tamimi R, Nanus D, Rebbeck T, Kensler K. Prostate-specific antigen testing rates in high-risk populations: results from the All of Us Research Program. Cancer Causes Control. 2024;35(3):509-21.
14. Seraphin T, Joko-Fru, W, Kamate B, Chokunonga E, Wabinga H, Somdyala N, et al. Rising prostate cancer incidence in sub-Saharan Africa: a trend analysis of data from the African Cancer Registry Network. Cancer Epidemiol Biomarkers Prev. 2021;30(1):158-65.
15. Bugoye FC, Leyna GH, Moen K, Mmbaga EJ. Knowledge, perceived risk and utilization of prostate cancer screening services among men in Dar es Salaam, Tanzania. Prostate Cancer. 2019;2463048.
16. Wanyangah P. Prostate Cancer Awareness, Knowledge, Perception on Self-vulnerability and Uptake of Screening among Men in Nairobi County, Kenya. Available at: http://ir- library.ku.ac.ke/ handle/123456789/9005. Accessed on 12 April 2025.
17. Mbugua R, Oluchina S, Karanja S. Prostate cancer awareness and screening among men in a rural community in Kenya: a cross-sectional study. Afr J Urol. 2021;27(1):7.
18. Bartendi W, Tshiamo B, Mogobe D, McFarland M. Barriers to Prostate Cancer Screening by Men in Sub-Saharan Africa: An Integrated Review. Nurs Scholars. 2020;52(1):85-94.
19. Mutiso J, Gitonga C, Abdullahi B, Simbauni J, Gicheru M. Alarming Cases of Cancer in Kenya: A Case for Meru and Tharaka Nithi Counties. Br J Healthc Med Res. 2023;10(1):55-64.
20. Charan J, Biswas T. How to Calculate Sample Size for Different Study Designs in Medical Research? Indian J Psychol Med. 2013;35(2):121-6.
21. Weinrich S, Rachelle S, Barbara M, Carrie D, Sanggil K, Courtney W, et al. Knowledge of the Limitations Associated with Prostate Cancer Screening Among Low-income Men. Cancer Nursing. 2004;27(6):442-51.
22. Ngowi B, Mremi A, Mbwambo O, Mitao P, Nyindo M, Mteta A, et al. Prostate cancer knowledge and barriers to screening among men at risk in northern Tanzania: A community-based study. Cancer Treatment and Research Communications. 2024;39:100811.
23. Ekwan R, Bua E, Nantale R, Opito R, Abingwa P, Sserwanja Q, et al. Uptake of prostate cancer screening and associated factors among men aged 50 years and above in Lira city, Uganda: a cross-sectional study. BMC Public Health. 2023;23:432.
24. Ugochukwu U, Odukoya O, Ajogwu A, Ojewola R. Prostate cancer screening: what do men know, think and do about their risk? Exploring the opinions of men in an urban area in Lagos State, Nigeria: a mixed methods survey. Pan Afr Med J. 2019;34:168.
25. Benurugo G, Munyambaraga E, Chironda G, Bisanukuri E. Awareness on prostate cancer and screening practices among men attending outpatient at a referral hospital in Kigali, Rwanda: a quantitative study. Int J Africa Nurs Sci. 2020;13:100241.
26. Shanko A, Abute L and Tamirat T. Prostate Cancer Screening Practice and Associated Factors Among Men in Public Health Facilities of Hossana Town, Ethiopia. Patient Related Outcome Measures. 2022:229-38.
27. Maladze N, Maphula A, Maluleke M, Makhado, L. Knowledge and Attitudes towards Prostate Cancer and Screening among Males in Limpopo Province, South Africa. Int J Environ Res Public Health. 2023;20(6):5220.
28. Opondo CO, Onyango PO, Asweto CO. Effect of Perceived Self-Vulnerability on prostate Cancer Screening Uptake and Associated factors: a cross-

sectional study of Public Health Facilities in Western Kenya. Ann Glob Health. 2022;88(1):12.
29. Abuadas M, Petro-Nustas W, Albikawi Z. Predictors of Participation in Prostate Cancer Screening among Older Men in Jordan. Asian Pac J Cancer Prev. 2015;16(13):5377-83.

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