Knowledge and Perception of Prostate Cancer among Males in Rural Communities in Esan North East Local Government Area of Edo State, Nigeria

Sulymon A. Saka [a*], Martins O. Odafen [b], Obiajulum N. Emekolom [b], Blessed Oseikhuemen [a], Williams I. Courage [a], Akhigbe E. Marvelous [c], Chukwuka E. Elochukwu [a] and Akhaine J. Precious [d]

[a] *Irrua Specialist Teaching Hospital, Nigeria.*
[b] *Central Hospital, Benin.*
[c] *Enugu State Teaching Hospital, Nigeria.*
[d] *Department of Internal Medicine, Central Hospital, Benin.*

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Original Research Article

ABSTRACT

Background: Prostate cancer poses a significant health challenge globally, necessitating comprehensive understanding, awareness, and proactive screening practices.
Objective: This study addressed the existing gaps in knowledge, perceptions, and screening practices related to prostate cancer among men in rural communities in Esan North LGA, Edo State

_____

*Corresponding author: E-mail: sakasulymon@gmail.com;

Methodology: The study engaged 312 participants, employed a structured questionnaire to gather data Data analysis involved both descriptive and inferential statistics, revealing associations between variables and providing insights into the North East LGA of Edo.

Results: 59% of participants showed poor knowledge of prostate cancer, and among those who demonstrated good knowledge (27.2%%), their sources of information varied including heath workers (48.4%), relatives (34.4%) and radio/televison (10.9%). 23%% showed good perception of vulnerability to prostate cancer as some participants perceived that awareness is prerequisite for having prostate cancer. However, challenges in understanding risk factors and misconceptions about prostate cancer were prevalent. Prostate cancer screening practices were limited, with only 7.7% have had PSA blood test done before. Barriers to seeking information and medical care, including fear, financial constraints, and communication challenges, were evident.

Conclusion: The study highlighted the urgent need for targeted interventions to enhance knowledge, remove misconceptions, and overcome barriers to prostate cancer awareness and screening practices.

1. INTRODUCTION

Prostate cancer is one of the most prevalent cancers affecting males worldwide. It is a significant public health concern due to its high incidence and potential for morbidity and mortality. While it is a global issue, its impact varies among different populations and regions. It is the second most commonly diagnosed cancer in men globally, with an estimated 1.4 million new cases reported in 2020 alone [1]. The incidence rates vary across regions, with higher rates observed in developed countries such as North America, Europe, and Australia, compared to developing nations [2,3]. This disparity can be attributed to differences in screening practices, genetic predisposition, and lifestyle factors.

Age is a crucial risk factor for prostate cancer, as the incidence increases with advancing age. The majority of cases are diagnosed in men aged 65 years and older [4]. Additionally, a family history of prostate cancer significantly increases the risk, suggesting a genetic component to the disease [2]. Ethnicity also plays a role, with African American men having the highest incidence rates globally [4]. Other risk factors include obesity, smoking, and exposure to certain occupational hazards [2].

Efforts to reduce the burden of prostate cancer include early detection through screening programs. Prostate-specific antigen (PSA) testing is commonly used, although its effectiveness and potential harms remain a subject of debate [2]. Treatment options for prostate cancer include surgery, radiation therapy, hormone therapy, and chemotherapy, depending on the stage and aggressiveness of the disease [4].

The mortality rates associated with prostate cancer also exhibit significant variation worldwide. In 2020, prostate cancer accounted for approximately 375,000 deaths globally, making it the fifth leading cause of cancer-related deaths in men [5]. Mortality rates tend to be higher in low- and middle-income countries, where access to early detection and treatment options is limited. This highlights the importance of implementing effective screening programs and improving health-care infrastructure in these regions [6].

A study aimed at assessing the awareness of prostate cancer and screening among men aged 40–69 years in a rural community in Kenya was conducted by Mbugua RG et al. [7]. "Data were collected using a pretested questionnaire among 576 men and a Focus Group Discussion guide among 44 men. The study was conducted in all the community units in Gatundu North and Kiambu Sub-counties, Kenya. Of the men interviewed, 84% had never heard of prostate cancer. Slightly below half (40.6%) of the respondents had heard of prostate cancer screening. There was the existence of myths and misconceptions which predominantly associated prostate cancer with sexual behaviors. Overall, 57.3% of the respondents had a low level of awareness of prostate cancer. The prevalence of prostate cancer screening was 5%. Willingness to undergo screening in the future was high (81%) among the participants. The most frequently cited (56.9%) reason for lack of willingness to screen was the participant's belief that they were well. Participants who were aware

of prostate cancer screening were more likely to take up screening. Awareness of prostate cancer symptoms, treatment, and screening was low with the existence of myths and misconceptions. The level of prostate cancer screening was abysmally low. 57.3% of the respondents had a low level of awareness of prostate cancer" [7].

In another study done with the aim of assessing prostate cancer knowledge and screening practices among men in Sokoto, Nigeria [8]. "A descriptive cross-sectional study was conducted among 300 participants (selected by systematic sampling technique) attending the medical and surgical outpatient clinics of UDUTH, Sokoto, Nigeria. The mean age of the respondents was 53.13 ± 7.92 years. Only 15 (5.0%) and 4 (1.3%) of the 300 respondents were aware of prostate cancer and prostate cancer screening respectively. Most of the respondents (95.0%) had poor knowledge of prostate cancer, and none of them have ever had a prostate cancer screening test done, with the most commonly cited reason being lack of awareness (98.6%)" [8].

In a study conducted by Ibebuike JE et al. [9] aimed at determining the perception of prostate cancer screening among men in Umulogho, Obowo L.G.A. "The research work was carried out in Umulogho in Obowo L.G.A. of Imo State. Out of the finite population of 502, the researcher selected 222 men. The result showed that 88.7% of the men admitted to have heard of prostate cancer, while 11.3% lack knowledge of such. Regarding source of information, most of them sourced their information from health workers/practitioners 51%, relations/friends 18.5%, mass media 12.6% with least source of information obtained from Church/Pastor/Reverend/Priest 6.8%. The result also showed that 44.6% of the men know prostate cancer as a form of tumor that attack gland in the male reproductive organ, 19.4% admitted it is the inability to gain and maintain erection, 30.2% said it is inability to impregnate a woman while 5.8% affirmed that it is weakness of the penis. Result from the survey indicated that 57.2% of the men identified smoking as a predisposing factor to prostate cancer, 54.5% attributed it to increasing age, 49.1% identified obesity as a contributing factor, 39.2% said it runs in family, 38.3% attributed prostate cancer to infection of the prostate, vasectomy 35.6%, gene mutation 21.2%, while 17.6% affirmed chemical exposure can lead to prostate cancer.

Summarily 88 (39.5%) know the risk factors of prostate cancer. Most of the men are aware of prostate cancer 88.7% and also knowledgeable that prostate cancer is a form of tumor that attack gland in the male reproductive organ 44.6%, and mean value of 88(39.5%) about risk factors. Majority of the men are conversant of various treatment options for prostate cancer and knew that surgery 62.2% is one of the treatment options" [9].

Similarly, a study by Justina Ifeoma O et al. [10] to study determined Prostate Cancer knowledge, attitude and screening behaviours in a sample of Nigerian men and further tested the significant differences within socio-demographic variables. The study was a descriptive survey involving a convenient sample size of 430 fathers of senior secondary school students within the ages of 15 to 19 years in Nigerian public secondary schools, during the third term academic session from April to July, 2021 [11,12]. A total of 394(92%) acceptable copies of the questionnaire were analyzed. The majority of participants were 50 years and above (55%), non-smokers (64%), had university degree (73%) and take alcohol (70%) respectively. The overall prostate cancer knowledge was adequate (93%) and the conclusion was that Nigerian men had adequate knowledge about prostate cancer.

A study conducted to examine the Risk Perception and Uptake of Prostate Cancer Screening among Civil Servants in Oyo State Secretariat, Ibadan [13], a descriptive cross-sectional survey of 192 male staff of Oyo State Secretariat, selected by simple random sampling technique. Respondents' risk perception and uptake of prostate cancer screening were examined using a structured questionnaire. Mean age of respondents was 47.44±5.36 years. Up to 140(73.3%) of respondents were aware of prostate cancer, mainly through literature (29.5%), 53.8% had good knowledge of prostate cancer. However, 78% perceived themselves as not at risk of prostate cancer. For 39.6%, prostate cancer is a myth. The risk perception for Prostate Cancer is low among the study cohorts.

To determine knowledge and perceived risk of prostate cancer, and the utilization of prostate cancer screening services, and associated factors, among men in Dar es Salaam, Tanzania. A research was conducted by Fidelis CB et al. [14] Tanzania. It was population-based cross-sectional study involving men aged 40 years and

above living in Dar Es Salaam between May and August, 2018. The result shows that a total of 388 men with a median age of 53 years (IQR 44–55) participated. Half (52.1%) had poor knowledge about prostate cancer and prostate cancer screening. A third (32.3%, =125) perceived the risk of prostate cancer to be low. Knowledge about prostate cancer and prostate cancer screening services was low among men in Dar es Salaam with a third perceiving themselves to be at no risk for the disease. Low perceived risk of prostate cancer and low knowledge about the disease is a major cause of late presentation in the hospitals.

In another cross-sectional study conducted to determine awareness, knowledge and the Uptake of Prostate Cancer Screening tests among males aged 40 and above living in Ido-Ekiti in Ido-Osi local government area, Ekiti State, Nigeria [15]. The study revealed that "the majority of the correspondents were aware of prostate cancer (57.9%). More than two-thirds of the respondents have poor knowledge of prostate cancer and the screening test (74.4%), with a median knowledge score of 30%. The uptake of prostate cancer screening tests was very low among the respondents (18.2%)" [15,16].

Additionally, a study conducted by Adedeji AI. et al. [17] to investigate the behaviour and social factors that underlie the risk perception and screening behaviour among rural men in southwest nigeria, a descriptive cross-sectional design was adopted and an interview administered questionnaire was used. A sample of 384 men who lived in six rural communities across southwest Nigeria participated in the study. The result showed that knowledge of prostate cancer has a significant but weak relationship with prostate cancer screening behaviour p=0.02.

Starting cancer treatment early can improve outcomes. Psychosocial factors influencing patients' medical help-seeking decisions may be particularly important in low and lower middle-income countries where cancer outcomes are poor. A research done by McCutchan G. et al. [16]. The qualitative studies suggested that "use of traditional, complementary and alternative medicine was a key barrier to medical help-seeking in low and lower middle- income countries, and was influenced by causal beliefs, cultural norms and a preference to avoid biomedical treatment. Women face particular

barriers, such as needing family permission for help- seeking, and higher stigma for cancer treatment. Additional psychosocial barriers included: shame and stigma associated with cancer such as fear of social rejection (eg, divorce/disownment); limited knowledge of cancer and associated symptoms; and financial and access barriers associated with travel and appointments" [16].

In a survey to determine barriers and facilitators to Uptake of Prostate Cancer Screening in a Kenyan Rural Community was done by *Mbugua RG* et al. [11]. The objective of the study was to explore the barriers and facilitators to the uptake of prostate cancer screening among men aged 40–69 years in a rural community in Kenya. The result showed that barriers to screening included lack of knowledge, fatalistic beliefs, low risk perception, stigma, and male dominance factors.

Despite the existing literature on prostate cancer knowledge and perception done in different region in the world, there are no established studies specifically focusing on rural communities in Esan North East LGA of Edo State. This research aims to address this gap by providing valuable insights into the knowledge, perception and screening practices of prostate cancer among males in these communities.

Limited research has been conducted on the knowledge and perception of prostate cancer among males in rural communities, especially in the Esan North East Local Government Area (LGA) of Edo State. This research aims to bridge this gap by exploring the level of knowledge and perception of prostate cancer among males in these rural communities. By exploring the knowledge gaps and understanding the perceptions surrounding prostate cancer in these communities, this research can contribute to the development of effective interventions, improved health outcomes, and reduced health disparities. It is essential to prioritize research in this area to ensure that males in rural communities have access to accurate information, early detection, and appropriate healthcare services for prostate cancer.

The primary objectives of this research are to assess the level of knowledge, explore the self-perceived vulnerability, determine the prostate cancer screening practices and identify potential barriers to seeking information and medical care related to prostate cancer among men in a rural community in Esan North East LGA.

2. METHODOLOGY

This study was a descriptive cross-sectional study conducted among men of age 30 years and above in Esan North East Local Government Area is one of the local government Area in Edo state Nigeria. Its administrative headquarters is in Uromi /Uzea. It is divided into 11 political wards [18]. Esan North East Local Government Area has estimated population of 119,346 and an area of 338 km (131 sq mi) with a population density of 472.8 inhabitants per square kilometer (122.5 sq mi) (2016) [18]. The projected population as at 2022 was 180,200 [19]. The major occupation of the population include Farming, Trading, Furniture making, Wood processing while some are Civil servants. Health care facilities in the local government are both public and private which include a general hospital, Private Clinics and Maternity Homes. There is no Public Health Facilities where Prostate Cancer Screening and Management is done in the Local Government Area.

The duration of this study was 16 weeks. To participate in this study, respondents should be males of age 30 years and above and had to be willing to participate in the study. Those who had been diagnosed of prostate cancer were excluded.

The sample size was estimated using Cochran's formula for cross sectional survey [12] where P was the proportion of respondents with poor knowledge of prostate cancer and the screening test (74.4%) from similar previous study [15]. The calculated sample size was adjusted for non-response, missing questionnaires or incompletely filled questionnaires and a total of 326 was obtained. A Simple Random sampling method was employed to get equal number of respondents in each of the 11 geographical wards of the local government which is 30 participants from each ward. A standardized structured questionnaire was designed to cover the study questions and objectives. It was used to obtain information about the study participants' socio-demographic characteristics, their knowledge and awareness of prostate cancer and the seriousness of the disease, their prostate cancer screening practices and the barrier to seeking information and medical care related to prostate cancer. Participants who could read and write were given questionnaires to fill out independently while the researchers personally conducted face to face interviews to administer and interpret the questionnaires to the selected consenting respondents who could not read. The questionnaire was partly adapted from similar previous studies [15] but tailored to suite this study. The questionnaire was pretested among consenting small group of individuals in Obeidu, Ivue and Arue Communities (ward 2 and 3) to ensure its clarity, relevance, reliability, and appropriateness. During this process, the questionnaires were administered to 10% of sample size which is approximately 32 respondents.

Statistical data analysis was done using the International Business Machine (IBM)'s Special Package for Social Science (SPSS) version 21 for statistical test of association between proportions. Data was also analyzed using inferential statistics by Chi- squared methods to examine the relationship between dependent and independent variables to identify any significant association. Measurement for the study was conceptually derived from the health belief model [ ] in which modifying factors variables such as knowledge, perception and screening practices options were incorporated in the instrument designed for the study. Knowledge of prostate cancer was measured using 12 questions on the cause, symptoms, signs and treatment. The question is scored on a 3 point Likert scale [ ] of "yes", "no" and "I don't know". The scale is scored as yes = 1, no = 0, I don't know = 0. This gives a maximum of score of 12 points. Those that score >8 of 12 points will be considered as having a "good" knowledge; those that score 4-7 of 12 points are regarded as having "fair" knowledge while those that have <4 of 12 points are graded as having "poor" knowledge. The perception variables was measured on a 4 point Likert-type scale with responses such as; "strongly agree", "agree", "disagree" and "strongly disagree" coded so that a low value on perception domain represent little or no perception of the vulnerability and seriousness of the disease. Perception items are aggregated to create a scale of measurement on a 30-point scale. For the positive statement the scale is; "strongly agree" = 3, "agree" = 2, "disagree" = 1, "strongly disagree" = 0. For the negative statements the scale is; "strongly disagree" = 3, "disagree" = 2, "agree" = 1, "strongly agree"= 0. Respondents with a score >20 of 30 points will be considered as having "good" perception, those with score of 11 – 19 points are regarded as having a "fair" perception while those having a score <10 have little or no perception. Screening practice was measured on a maximum of 16 point scale consisting of items regarding

screening practices. A low aggregate score will be assigned to little no screening whereas maximum score will be assigned to represent regular screening practices. The score is graded as follows; >12 of 16 points have "good" screening practices; 7-11 points is assigned "fair" screening practices while those who score <6 is regarded as having little or no screening practices.

Ethical clearance and approval was obtained from the Health Research Ethics of Irrua Specialist Teaching Hospital (ISTH), Irrua. Confidentiality was ensured throughout the study as respondents personal identifiers such as names will not be used. All respondents was assigned de-identifiers codes to maintain confidentiality and anonymity. Permission was obtained from the elders of the various communities, both verbal and written informed consent was obtained from respondents before administration of the questionnaires. The purpose of the research was explained in detail to the respondents with emphasis on the benefits of the research to the communities and participants. Respondents was assured of the confidentiality of the information got from them.

3. RESULTS

A total of 326 questionnaires were administered to the respondents. However, only 312 questionnaires were retrieved giving a response rate of 95.7%.

3.1 Sociodemographic Characterstics of the Respondents

Table 1. Sociodemographic features of the respondents

Variable	Frequency (n=312)	Percent (%)
Age group (years)		
31-40	127	40.7
41-50	86	27.6
51-60	51	16.3
61-70	42	13.5
71 above	6	1.9
Mean age ± SD	46.34 ±11.30	
Religion		
Christianity	263	84.3
Islam	37	11.9
Other	12	3.8
Level of education		
Secondary	143	45.8
Tertiary	80	25.6
Primary	75	24.0
Quranic school only	14	4.5
Marital Status		
Married	245	78.5
Single	45	14.4
Divorced	12	3.8
Separated	10	3.2
Occupation		
Trader	120	38.5
Commercial motorbike rider	57	18.3
Taxi driver	27	8.7
Businessman	62	19.9
Teacher	15	4.8
Electrician	5	1.6
Mechanic	10	3.2
barber	13	4.2
Other	3	1.0

3.2 Assessment of Knowledge and Awareness of Prostate Cancer

Table 2. Assessment of knowledge and awareness of prostate cancer

Variable	Frequency (n=312)	Percent (%)
Have you ever heard of prostate cancer?		
Yes	128	41.0
No	184	59.0
Through which medium	n=128	
radio/television	14	10.9
newspaper/magazine	6	4.7
friends/relatives	44	34.4
health workers	62	48.4
church/mosque	2	1.6
Risks of prostate cancer*		
As age increase (old age)	118	92.2
Family history of prostate cancer	81	63.3
Being black	45	35.2
Obesity	9	7.0
Consumption of fatty foods	19	14.8
Symptom or sign of prostate cancer*		
A need to urinate frequently especially at night	120	93.8
Difficulty starting urination or holding back urine	108	84.4
Weak or interrupted flow of urine	70	54.7
Difficulty in having an erection	30	23.4
Painful urination or ejaculation	101	78.9
Blood in urine or semen	38	29.7
Pain in the pelvic area or bones	124	96.9

* indicates multiple response

Only 41% of the respondents had previously heard of prostate cancer, with various sources of information which include health workers (48.4%), friends/relatives (34.4%) and radio/television (10.9%).
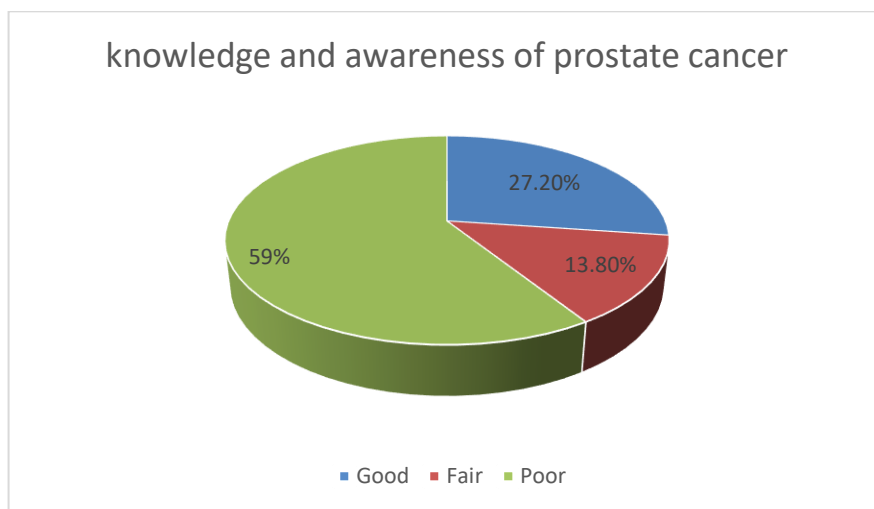

Fig. 1. Knowledge and awareness of prostate cancer

In terms of overall knowledge assessment, 27.2% exhibited a good understanding of prostate cancer symptoms, 13.8% had a fair level of knowledge, while 59.0% showed poor knowledge.

3.3 Assessment of Perception of Vulnerability to Prostate Cancer and Seriousness of the Disease

Table 3. Assessment of perception of vulnerability to prostate cancer

Variable	Strongly agree n(%)	Agree n(%)	Disagree n(%)	Strongly disagree n(%)
If I am not aware of prostate cancer, I can not have it	126 (40.4)	14 (4.5)	57 (18.3)	115 (36.8)
Prostate cancer is a deadly disease	150 (48.1)	20 (6.4)	142 (45.5)	0 (0.0)
Prostates cancer is an infection which can be transmitted sexually	14 (4.5)	16 (5.1)	237 (76.0)	45 (14.4)
Prostate cancer has no cure	77 (24.7)	17 (5.4)	192 (61.6)	26 (8.3)
Prostate cancer cannot make me infertile	42 (13.5)	37 (11.9)	158 (70.5)	13 (4.2)
Any male of advancing age can have prostate cancer	124 (39.7)	28 (9.0)	158 (50.6)	2(0.6)
Prostate cancer affect only white people	2 (0.6)	167 (53.5)	67 (21.5)	76(24.4)
All men are at risk of having prostates cancer	86 (27.6)	25(8.0)	181(58.0)	20(6.4)
Prostate cancer does not kill	12 (3.8)	164(52.5)	28 (9.0)	108 (34.6)
I perceive great benefit in going to the clinic regularly for a medical check up	242 (77.6)	52 (16.7)	4 (1.3)	14 (4.4)

An intriguing aspect is the participants' perception that awareness is a prerequisite for having prostate cancer. While 40.4% strongly agreed, 36.8% strongly disagreed, emphasizing diverse beliefs within the community.
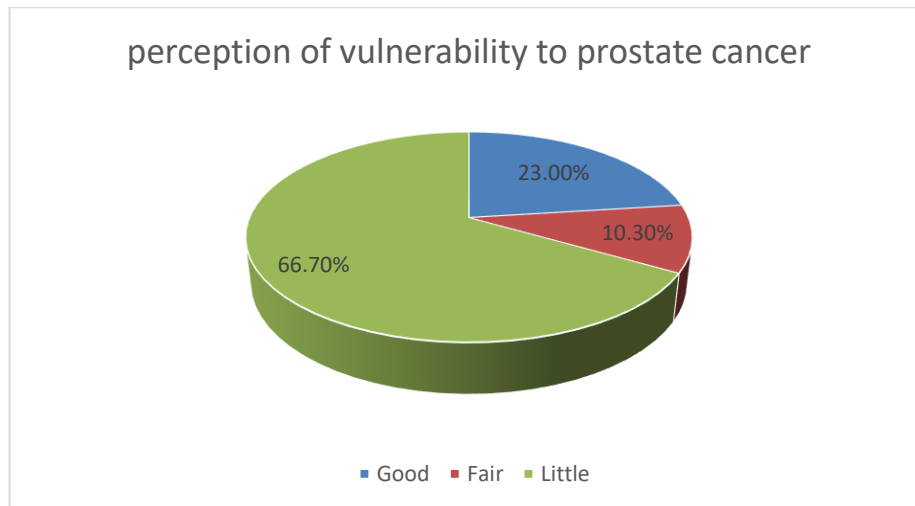

Fig. 2. Shows the perception of vulnerability to prostate cancer

66.7% perceived their overall vulnerability to prostate cancer as little.

3.4 Assessment of Prostate Cancer Screening Practices

Table 4. Assessment of prostate cancer screening

Variable	Frequency (n=312)	Percent (%)
Have you ever heard of prostates cancer screening test?		
Yes	74	23.7
No	238	76.3
Screening test for prostate cancer*	n=74	
Pap smear test	10	13.5
Mammography	10	13.5

127

Variable	Frequency (n=312)	Percent (%)
Digital rectal examination	55	74.3
Prostate specific antigen	69	93.2
Requirements for prostate cancer screening*		
Go for an appointment with a doctor	64	86.5
Give the doctor your urine sample	48	64.9
Blood sample is taken	72	97.3
Physical examination	69	93.2
Take body temperature	54	73.0
Have you ever had prostates specific antigen blood test done for you?	n=312	
Yes	24	7.7
No	288	92.3
Reasons for the test		
It was recommended by the doctor	24	100.0
Times PSA was done		
once	19	79.2
Twice	3	12.5
Thrice	2	8.3
How long ago did you have the most recent PSA test done?		
<1 year ago	14	58.3
2 years ago	7	29.2
>2 years	3	12.5
Reasons for not doing PSA test	n=288	
I am not aware of PSA test	213	74.0
I do not need it, as i am not at risk of developing prostates cancer	46	16.0
The test is not available	15	5.2
The test is costly	10	3.5
I have passed the recommended age for PSA test	4	1.4

Only 23.7% were aware of screening tests, with digital rectal and prostate specific antigen recognized by a limited proportion.
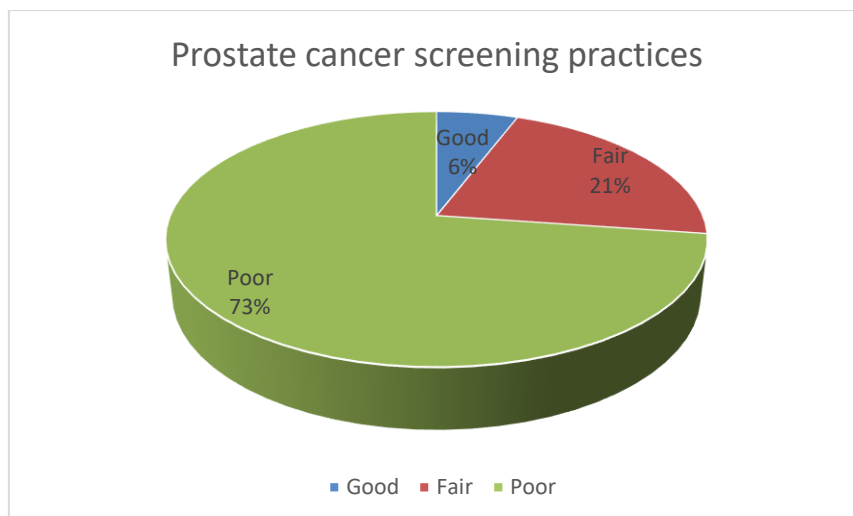

Fig. 3. Prostate cancer screening practices

Assessing the overall screening practices, only a small proportion (6%) were considered to have good practices.

3.5 Assessment of Barriers to Seeking Information and Medical Care Related to Prostate Cancer

Table 5. Assessment of barriers to seeking information and medical care

Variable	Frequency (n=321)	Percent (%)
Impact on willingness to seek information or medical care for prostates cancer*		
Fear of the diagnosis	209	67.0
Concerns about treatment side effects	39	12.5
Stigma associated with prostate cancer	74	23.7
Lack of trust in healthcare system	37	11.9
Lack of awareness about symptoms	178	57.1
Cultural or religious beliefs	16	5.1
Financial constraints	252	80.8
Lack of health facilities for PC management in my LGA	8	2.6
Have you ever faced challenges in accessing healthcare services?		
Yes	34	10.9
No	278	89.1
The challenges faced*	n=34	
Long waiting in the hospital	5	14.7
Unorganized health system	2	5.9
Lack of equipment	2	5.9
How comfortable do you feel discussing prostate health with your healthcare provider?		
Very comfortable	146	46.8
Somewhat comfortable	119	38.1
Not comfortable at all	47	15.1
Have you ever experienced communication barriers with heaithcare provider?		
Yes	23	7.4
No	289	92.6
Are you aware of preventive measure for prostates cancer such as regular screening?		
Yes	67	21.5
No	245	78.5

Critical barriers to seeking information and medical care were identified, including the fear of diagnosis, financial constraints, and limited awareness about symptoms. Communication barriers with healthcare providers were reported by 7.4%, suggesting a need for improved patient-provider interactions. The table showed that while 21.5% were aware of preventive measures like regular screening, the majority lacked this awareness.

Table 6. Level of education and knowledge and awareness of prostate cancer

Level of education	Knowledge and awareness of Prostate cancer			Total (n=312)	X^2	P-value
	Good (n=85)	**Fair (n=43)**	**Poor (n=184)**		25.028	0.000*
Quranic school only	2	0	12	14		
Primary	21	11	43	75		
Secondary	26	20	97	143		
Tertiary	36	12	32	80		

The results indicate a statistically significant association (X^2 = 25.028, p-value = 0.000) between the level of education and knowledge and awareness of prostate cancer.

Table 7. Level of education and Perception of vulnerability to prostate cancer

Level of education	Perception of vulnerability to prostate cancer			Total (n=312)	X^2	P-value
	Good (n=72)	Fair (n=32)	Little (n=208)		15.016	0.020*
Quranic school only	0	0	14	14		
Primary	15	13	47	75		
Secondary	32	14	97	143		
Tertiary	25	5	50	80		

The results indicate a statistically significant association (X^2 = 15.016, p-value = 0.020) between the level of education and the perception of vulnerability to prostate cancer.

Table 8. Level of education and Prostate cancer screening practices

Level of education	Prostate cancer screening practices			Total (n=312)	X^2	P-value
	Good (n=18)	Fair (n=67)	Little/No (n=227)		54.875	0.000*
Quranic school only	0	0	14	14		
Primary	10	9	56	75		
Secondary	5	20	118	143		
Tertiary	3	38	39	80		

The results indicate a highly statistically significant association (X2 = 54.875, p-value = 0.000) between the level of education and prostate cancer screening practices.

Table 9. Occupation and Knowledge and awareness of Prostate cancer

Occupation	Knowledge and awareness of Prostate cancer			Total (n=312)	X^2	P-value
	Good (n=85)	Fair (n=43)	Poor (n=184)		48.260	0.000*
Trader	35	14	71	120		
Commercial motorbike rider	8	5	44	57		
Taxi driver	7	0	20	27		
Businessman	18	11	33	62		
Teacher	9	5	1	15		
Electrician	3	1	1	5		
Mechanic	2	5	3	10		
Barber	3	1	9	13		
Other	0	1	2	3		

The results reveal a highly statistically significant association (X^2 = 48.260, p-value = 0.000) between occupation and knowledge and awareness of prostate cancer.

Table 10. Occupation and Prostate cancer screening practices

Occupation	Prostate cancer screening practices			Total (n=312)	X^2	P-value
	Good (n=18)	Fair (n=67)	Little/No (n=227)		37.267	0.002*
Trader	8	26	86	120		
Commercial motorbike rider	1	7	49	57		
taxi driver	1	2	24	27		
Businessman	4	12	46	62		
Teacher	2	9	4	15		

Occupation	Prostate cancer screening practices			Total (n=312)	X^2	P-value
	Good (n=18)	Fair (n=67)	Little/No (n=227)		37.267	0.002*
Electrician	0	3	2	5		
Mechanic	0	4	6	10		
barber	1	3	9	13		
Other	1	1	1	3		

The results indicate a statistically significant association (X^2 = 37.267, p-value = 0.002) between occupation and prostate cancer screening practice.

4. DISCUSSION

The study included 312 respondents, with various sociodemographic characteristics. The age distribution showed a predominant representation in the 31-40 age group (40.7%), followed by 41-50 (27.6%). Most respondents identified as Christians (84.3%), followed by Islam (11.9%). In terms of education, the majority had secondary education (45.8%), followed by tertiary (25.6%) and primary (24.0%). The marital status indicated a higher percentage of married participants (78.5%). Occupationally, traders comprised the largest group (38.5%), followed by commercial motorbike riders (18.3%) and businessmen (19.9%).

In regards to knowledge, this study showed that 41% of the respondents had previously heard of prostate cancer, with health workers and friends/relatives being significant sources of information while the remaining 59% had not. Similar to a study carried out in a rural community of Kenya [7] where 84% of men aged 40-69 had never heard of prostate cancer. A significant portion from those who have heard of prostate cancer demonstrated recognition of common signs, with 93.8% identifying a frequent need to urinate, especially at night, 84.4% associated the condition with difficulty initiating or holding back urine, pain in the pelvic area or bones (96.9%), painful urination or ejaculation (78.9%) and 54.7% recognized a weak or interrupted urine flow, these indicated good knowledge of prostate cancer. In terms of overall knowledge assessment, 27.2% exhibited a good understanding of prostate cancer symptoms, 13.8% had a fair level of knowledge, while 59.0% showed poor knowledge.

An intriguing aspect is the participants' perception that awareness is a prerequisite for having prostate cancer. While 40.4% strongly agreed, 36.8% strongly disagreed, emphasizing diverse beliefs within the community. With 66.7% perceived their overall vulnerability to prostate cancer as little. Misconceptions persisted, with a considerable percentage strongly believing in the deadliness of prostate cancer. The study also identified a need for targeted education to dispel misconceptions about infertility caused by prostate cancer.

The study revealed challenges in promoting screening practices. Only 23.7% were aware of screening tests, with digital rectal examination and prostate-specific antigen recognized by a limited proportion which are the major screening tests of prostate cancer. Although those who underwent screening did so on a doctor's recommendation, barriers such as lack of awareness, perceived low risk, and unavailability were reported by a significant number. Assessing the overall screening practices, only a small proportion (6%) were considered to have good practices. This finding agrees with the study done in Ido- Ekiti, Nigeria [15] where the uptake of prostate cancer screening tests was 18.2% indicating low utilization.

Critical barriers to seeking information and medical care were identified, including the fear of diagnosis, financial constraints, and limited awareness about symptoms. Communication barriers with healthcare providers were reported by 7.4%, suggesting a need for improved patient-provider interactions. The study revealed that while 21.5% were aware of preventive measures like regular screening, the majority lacked this awareness.These barriers were also indicated in a study carried out in Kenyan rural community [11], however, majority indicated fatalistic beliefs and stigma.

This study found significant associations between education level and knowledge, perception of vulnerability, and screening practices for prostate cancer (p<0.05). Additionally, there was a highly statistically significant association between occupation and both knowledge of prostate cancer and screening practices (p< 0.05). By targeting education and occupation-specific approaches, we can enhance prostate cancer awareness and screening practices.

5. CONCLUSION

This study emphasized the urgency of implementing multifaceted interventions to address gaps in knowledge, dispel misconceptions, and overcome barriers to prostate cancer awareness and screening. The diverse beliefs within the community necessitate tailored educational campaigns.

Government need to allocate robust resources for public health campaigns, ensuring wide-reaching awareness initiatives and also develop and implement policies to enhance the accessibility and affordability of prostate cancer screening, particularly in underserved communities. For instance, making screening free will break the barrier to prostate cancer screening utilization imposed by costs.

For health sector, there is a need to conduct regular training programs for healthcare providers to enhance their communication skills and engage in patient education as well as establish dedicated prostate cancer screening clinics, particularly in areas with limited healthcare infrastructure. Tailored educational programs should be developed to cater to different education levels, using simple and visual materials for those with less education and detailed information for those with higher education.

At Community level, collaboration with community leaders and employers to organize and promote prostate cancer awareness events is very important. Workplace health initiatives including health talks, distribution of educational materials and on-site screenings, particularly in high-risk occupations are essential. This will foster an environment conducive to open discussions about prostate health within local communities.

A collaborative effort, integrating these recommendations across governmental, health sector, and community levels, is imperative to bring about a meaningful impact on prostate cancer awareness, perception, and screening practices within the studied population.

6. LIMITATIONS

The most important limitation to this study is the possible selection bias in which those recruited for this study may not represent the entire population of men in Esan North East LGA, Edo State.

CONSENT AND ETHICAL APPROVAL

Consent was obtained from each participant in line with Helsinki's declaration. Ethical approval for this work was obtained from Irrua Specialist Teaching Hospital review committee.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Bray F, Ferlay J, Soerjomataram I, Siegel RL, Torre LA, Jemal A. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA: A Cancer Journal for Clinicians. 2018;68(6):394-424.
2. Crawford ED, Rosenberg MT, Partin AW. Prostate cancer: Epidemiology and risk factors. Seminars in Oncology Nursing. 2018;34(6):457-461.
3. Ferlay J, Colombet M, Soerjomataram I, Mathers C, Parkin DM, Piñeros M, et al. Estimating the global cancer incidence and mortality in 2018: GLOBOCAN sources and methods. International Journal of Cancer. 2019;144(8):1941-1953.
4. Siegel RL, Miller KD, Fuchs HE, Jemal A. Cancer statistics, 2021. CA: A Cancer Journal for Clinicians. 2021;71(1):7-33.
5. Ferlay J, et al. Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer; 2020.
6. Rawla P. Epidemiology of prostate cancer. World J Oncol. 2019;10(2):63-89.
7. Mbugua RG, Oluchina S. Prostate cancer awareness and screening among men in a rural community in Kenya: cross-sectional study. African Journal of Urology. 2021; 27(1):1-10.
8. Awosun KJ, Yunusa EU, Agwu NP, Taofiq S. Knowledge of prostate cancer screening practices among men in Sokoto, Nigeria; 2018.
   Available:https://nepjol.info/index.php/AJMS
9. Ibebuike JE, NwoKike GI, Nwosu DC, Nwanjo HU. Perception of prostate cancer

screening among men in Umulogho Obowo LGA, Imo State. European Journal of Pharmaceutical and Medical Research, EJPMR. 2019;6(8):32-37.
Available:www.ejpmr.com

10. Justina IO, Ndubuisi FU, Uchenna CU. Prostate Cancer Knowledge and Screening Behaviours in a Sample of Nigerian men: A Descriptive Survey. Journal of Cardiovascular Disease Research. 2022;23(01).

11. Barriers and facilitators to uptake of prostate cancer screening in Kenya rural Community. The Annals of African Surgery.
Available:www.annalsofafricansurgery.com

12. Cockran WG. Sampling techniques (3rd ed.) New York: John Wiley & Sons; 1977.

13. Ndikom CM, Oluwole TG, Ilesanmi RE, Risk Perception and Uptake of Prostate Cancer Screening Among Civil Servants in Ibadan, Nigeria. African Journal on Biomedical Research. May, 2021;24:231-237.

14. 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; 2019.

Available:https://doi.org/10.1155/2019/2463048 .

15. Adewoye KA, Aremu SK, Adegbiji WA, Achebe CC. Awareness, Knowledge, and Factors that influenced the uptake of screening tests for prostate cancer among men aged 40 and older in Ido-Ekiti, Ekiti State, Nigeria. J Public Health Afr. 2023 Apr 19;14(4):2134.

16. McCutchan G, Weiss B, Quin-Scoggins H, DAO ANH, Downs T, Deng Y, Trung Lam, Ha Ho, Emery J, Brain K. Psychosocial influence on help-seeking Behavior for Cancer in low income and lower middle-income countries: a mixed-methods systematic review. BMJ Global Health; Feb19, 2021.
Available:https://GH.bmj.com/

17. Adedeji AI, Lawal SA, Aluko-Arowolo S, Oduwole EO. Men in Rural Nigeria have a poor Perception of Prostate Cancer; hence they seldom seek Screening; Psychooncology. 2021 may;30(5):773-779. DOI: 101002/pon.5645

18. Wikipedia; Esan North East LGA location and population.
Available:https://en.m.wikipedia.org

19. City population; Projected population of Esan North East LGA.
Available:https://www.citypopulation.de

Peer-review history:
The peer review history for this paper can be accessed here:
https://www.sdiarticle5.com/review-history/117460