

Knowledge of Risk Factors and Practices Towards Prostate Cancer Prevention Among Men in Mbaitoli Local Government Area, Imo State, Nigeria

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Abstract- Prostate cancer is the most frequently diagnosed cancer and a leading cause of cancer-related death among men in Nigeria, yet men's knowledge of its risk factors and their preventive practices in rural communities remain poorly documented. Guided by three objectives, this study (i) determined the level of knowledge of risk factors of prostate cancer, (ii) ascertained the practices towards prostate cancer prevention, and (iii) examined the difference in the level of knowledge of risk factors based on age, among men aged 40 years and above in Mbaitoli Local Government Area (LGA), Imo State, Nigeria. A cross-sectional descriptive design was adopted. Using a three-stage sampling technique, 396 men were selected from four towns and twelve villages in the LGA. Data were collected with a validated, structured questionnaire (test-retest reliability, $r = 0.82$) and analysed using descriptive statistics (frequency, percentage, mean, and standard deviation) and chi-square (χ^2) at $p < 0.05$. Results showed that respondents had an overall moderate knowledge (53.2%) of prostate cancer risk factors and demonstrated generally poor preventive practices ($\bar{x} = 2.25$ of a 4-point scale). Knowledge of risk factors differed significantly by age ($\chi^2 = 8.26$, $df = 2$, $p < 0.05$), with men aged 60 years and above recording the highest knowledge level (55.8%) and men aged 40–49 years the lowest (50.0%). The study concludes that moderate knowledge does not translate into good preventive practice among men in Mbaitoli LGA, and that age is a significant determinant of what men know about the disease. Community-based health education targeted at younger men, subsidised screening, and periodic follow-up evaluation are recommended to close this knowledge-practice gap.

Keyword: knowledge; men; practices; prevention; prostate cancer.

I. INTRODUCTION

Prostate cancer (PCa) is one of the most common cancers and a leading cause of cancer death among men worldwide. In 2020, it was the second most frequently diagnosed cancer and the fifth leading cause of cancer death among men globally, with an estimated 1.4 million new cases recorded that year [15]. In Africa, prostate cancer is the most frequently diagnosed male cancer, with a pooled continental incidence rate of 22.0 per 100,000 population [1]. Of the 474,169 cancer cases recorded among African men aged 0–84 years between 2016 and 2020, prostate cancer accounted for the largest share, at 35.0% [8]. Nigeria bears a disproportionate part of this burden: of the 14,334 prostate cancer deaths recorded among African men in 2020, Nigeria alone accounted for more than half [8].

The prostate is a walnut-sized gland of the male reproductive system situated below the bladder and in front of the rectum. Its principal secretory product, prostate-specific antigen (PSA), remains the most widely used biomarker for early detection when combined with digital rectal examination and biopsy. Prostate enlargement and PSA elevation increase progressively with age and have been linked to family history, race, hormonal factors, obesity, and inflammatory conditions of the gland [3].

In Nigeria, a hospital-based study among adult males aged 40 years and above in Imo State found that 32.3% had a diagnosed prostate condition, with prevalence rising to over 48% among men above 70 years [14]. A related awareness study among secondary school teachers in Mbaitoli LGA, Imo State, similarly found that although about half of

respondents were aware of primary preventive measures for prostate cancer, nearly as many lacked adequate knowledge of both primary and secondary prevention strategies [6]. Beyond awareness studies, the practices that predispose men to prostate cancer, such as a diet high in red meat and low in fruits and vegetables, physical inactivity, smoking, excessive alcohol consumption, obesity, and exposure to certain occupational chemicals, remain widespread but under-addressed in many Nigerian communities [5].

Men aged 40 years and above are expected to have adequate knowledge of prostate cancer risk factors and to actively engage in preventive practices, such as regular screening, physical exercise, adequate hydration, and a diet low in red meat, in order to reduce their risk. However, negative lifestyle patterns persist among Nigerian men, partly because of limited community-based screening, late presentation of cases, and poor health information systems. Mbaitoli LGA, a predominantly agrarian and trading community in Imo State with an estimated male population of 118,959 [8], has not previously been studied for prostate cancer knowledge and practice, despite the documented lifestyle patterns associated with increased risk among its inhabitants. This gap in locally generated evidence motivated the present study.

This study therefore assessed the knowledge of risk factors and the practices towards prostate cancer prevention among men in Mbaitoli LGA, Imo State, Nigeria. Specifically, the objectives of the study were to: (i) determine the level of knowledge of risk factors of prostate cancer among men in Mbaitoli LGA, Imo State; (ii) ascertain the practices towards prostate cancer prevention among men in Mbaitoli LGA, Imo State; and (iii) examine the difference in the level of knowledge of risk factors of prostate cancer among men in Mbaitoli LGA, Imo State, based on age. Correspondingly, the study was guided by three research questions: What is the level of knowledge of risk factors of prostate cancer among men in Mbaitoli LGA, Imo State? What are the practices towards prostate cancer prevention among men in Mbaitoli LGA, Imo State? And what is the difference in the level of knowledge of risk factors of

prostate cancer among men in Mbaitoli LGA, Imo State, based on age?

The study was anchored on the Health Belief Model (HBM), which proposes that health-related behaviour is shaped by an individual's perceived susceptibility to, and perceived severity of, a health threat, weighed against the perceived benefits and barriers of taking preventive action, in interaction with general health values, age, education, and income. Applied to this study, the HBM suggests that men's practices towards prostate cancer prevention in Mbaitoli LGA are shaped not only by what they know about risk factors, but also by how personally threatened they feel by the disease and by the social and economic barriers to taking preventive action.

Empirical evidence on prostate cancer knowledge, attitude and practice across Africa is mixed. In Rwanda, a quantitative cross-sectional study of men attending a referral hospital in Kigali found that although 80% of respondents were aware of prostate cancer, 64% could still not correctly identify its risk factors, and screening uptake stood at only 49.5% [4]. In Zambia, a hospital-based study of men aged 40 years and above at Kitwe Teaching Hospital similarly reported low knowledge and low screening uptake despite a largely positive attitude towards screening [7]. In Lagos, Nigeria, a cross-sectional study documented comparable gaps in prostate cancer knowledge and screening practice among men in an urban community [13].

Outside Africa, an analysis of the New South Wales 45 and Up Study in Australia found that frequency of general-practitioner consultation, prior treatment for benign prostatic hyperplasia, and older age were strongly associated with PSA-testing uptake [11], while a study among men in Saudi Arabia reported generally poor preventive practice despite adequate awareness of prostate cancer [2]. A review of modifiable risk factors in low- and lower-middle-income countries further highlighted that diet, physical inactivity, and tobacco use remain under-addressed drivers of the disease in these settings [5]. None of the reviewed studies was conducted in Mbaitoli LGA, underscoring the contribution of the present study to the local evidence base.

II. RESEARCH METHODS

A cross-sectional descriptive design, similar to that adopted in comparable Nigerian and Australian studies [13], [11], was used for the study. The study was conducted in Mbaitoli LGA, Imo State, Nigeria, an area comprising nine communities with a male population of 118,959, based on the 2006 national population census [10]. The sample size of 396 was determined using the Krejcie and Morgan table for sample size determination [9].

A three-stage sampling technique was employed. At stage one, four towns (Ifakala, Mbieri, Ubomiri, and Orodo) were selected from the nine towns in the LGA by simple random sampling (balloting without replacement). At stage two, three villages were selected from each town by the same method, yielding twelve participating villages. At stage three, thirty-three respondents aged 40 years and above were selected from each village by systematic sampling, giving a total sample of 396 respondents.

Data were collected using a self-developed, 29-item structured questionnaire titled the Knowledge of Risk Factors and Practices towards Prostate Cancer Prevention Instrument (KRIFIP), comprising three sections: Section A (three items on socio-demographic variables – age, education, and occupation), Section B (fourteen True/False items on knowledge of risk factors), and Section C (twelve items on preventive practices, scored on a four-point scale of Always, Often, Rarely, and Never). Face and content validity were established by three lecturers in

the Faculty of Health Sciences, Madonna University, Nigeria, while reliability was established using the test-retest method on ten health workers who were not part of the study population; the resulting scores, analysed with the Spearman rank-order correlation coefficient, yielded a coefficient of 0.82, indicating a reliable instrument [12]. All 396 copies of the questionnaire administered were retrieved (100% response rate) through a face-to-face approach, with the assistance of four trained research assistants.

Data were analysed using descriptive statistics of frequency, percentage, mean, and standard deviation. Knowledge scores were categorised as poor (0–39%), moderate (40–69%), and good ($\geq 70\%$), while practice scores on the four-point scale were categorised as poor (< 2.50) and good (≥ 2.50). The chi-square (χ^2) statistic was used to test the null hypothesis corresponding to research question three, at the 0.05 level of significance, using the formula:

$$\chi^2 = \sum (O_i - E_i)^2 / E_i$$

where O_i is the observed frequency and E_i is the expected frequency.

III. RESULTS

Three hundred and ninety-six (396) copies of the retrieved questionnaire were used in the analysis. The socio-demographic distribution of respondents is presented in Table 1.

TABLE 1: SOCIO-DEMOGRAPHIC DISTRIBUTION OF RESPONDENTS

Age (years)	n (%)	Education	n (%)	Occupation	n (%)
40–49	74 (18.7)	No formal educ.	60 (15.2)	Trader	19 (4.8)
50–59	218 (55.1)	Primary	158 (39.9)	Transporter	65 (16.4)
60 and above	104 (26.3)	Secondary	143 (36.1)	Farmer	34 (8.6)
		Tertiary	35 (8.8)	Public/Civil servant	125 (31.6)
				Unemployed	153 (38.6)
Total	396 (100)	Total	396 (100)	Total	396 (100)

Table 1 shows that respondents aged 50–59 years formed the largest age group (55.1%), most respondents had primary education (39.9%), and the largest occupational group was the unemployed (38.6%).

A. Research Question One: Level of Knowledge of Risk Factors of Prostate Cancer
Research question one sought to determine the level of knowledge of risk factors of prostate cancer among men in Mbaitoli LGA, Imo State. Data answering this question are presented in Table 2.

TABLE 2: KNOWLEDGE OF RISK FACTORS OF PROSTATE CANCER AMONG RESPONDENTS

S/N	Knowledge item	True n (%)	False n (%)
1	Prostate cancer risk increases with age.	194 (49.0)	202 (51.0)
2	A father/brother with prostate cancer doubles one's risk.	140 (35.4)	256 (64.6)
3	Lack of physical exercise can promote prostate cancer.	242 (61.1)	154 (38.9)
4	Cigarette smoking can lead to prostate cancer.	159 (40.2)	237 (59.8)
5	Exposure to pesticides/chemicals increases prostate cancer risk.	313 (79.0)	83 (21.0)
6	Frequent consumption of red meat can promote prostate cancer.	189 (47.7)	207 (52.3)
7	Absence from sex might increase the risk of prostate cancer.	278 (70.2)	118 (29.8)
8	Excessive alcohol consumption promotes prostate cancer.	159 (40.2)	237 (59.8)
9	Sexually transmitted diseases promote prostate cancer risk.	227 (57.3)	169 (42.7)
10	Men with prostatitis have a higher risk of prostate cancer.	313 (79.0)	83 (21.0)
11	Poor hydration can lead to prostate cancer.	125 (31.6)	271 (68.4)
12	Obesity increases the risk of aggressive prostate cancer.	183 (46.2)	213 (53.8)
13	Frequent ejaculation flushes out substances that lead to prostate cancer.	244 (61.6)	152 (38.4)
14	Low fruit/vegetable intake can promote prostate cancer.	174 (43.9)	222 (56.1)
Cluster (overall)		53.2%	

Note: 0–39% = Poor Knowledge; 40–69% = Moderate Knowledge; ≥70% = Good Knowledge.

and poor hydration (31.6%) were the least recognised risk factors.

Table 2 shows that respondents had an overall moderate knowledge (53.2%) of prostate cancer risk factors. The risk factors most correctly identified were exposure to pesticides and chemicals (79.0%) and prostatitis (79.0%), while family history (35.4%)

B. Research Question Two: Practices Towards Prostate Cancer Prevention
Research question two sought to ascertain the practices towards prostate cancer prevention among men in Mbaitoli LGA, Imo State. Data answering this question are presented in Table 3.

TABLE 3: PRACTICES TOWARDS PROSTATE CANCER PREVENTION AMONG RESPONDENTS

S/N	Practice item	Mean ($\bar{x}$)	SD
1	Avoid smoking cigarettes.	2.00	1.085
2	Limit alcohol consumption.	2.33	0.826
3	Participate in physical exercise.	2.51	0.822
4	Refrain from using chemicals in farming.	2.78	0.778
5	Avoid eating red meat.	2.05	0.567

S/N	Practice item	Mean ($\bar{x}$)	SD
6	Abstain from sexual activity.	2.82	0.857
7	Participate in prostate cancer screenings.	1.77	0.793
8	Avoid processed/canned foods.	2.14	0.588
9	Regularly go for checkups.	2.01	0.640
10	Pay attention to urinary symptoms.	2.26	0.571
11	Avoid foods rich in calcium.	2.02	0.612
12	Consume fruits and vegetables regularly.	2.31	0.775
	Cluster (overall)	2.25	0.740

Note: 0.00–2.49 = Poor Practice; ≥ 2.50 = Good Practice (4-point scale).

Table 3 shows that respondents demonstrated generally poor practices towards prostate cancer prevention ($\bar{x} = 2.25$, $SD = 0.74$). Only three items reached the good-practice threshold: abstaining from sexual activity ($\bar{x} = 2.82$), refraining from farm chemical use ($\bar{x} = 2.78$), and participating in physical exercise ($\bar{x} = 2.51$). Participation in prostate cancer screening recorded the lowest score ($\bar{x} = 1.77$).

C. Research Question Three: Difference in Knowledge of Risk Factors Based on Age

Research question three sought to examine the difference in the level of knowledge of risk factors of prostate cancer among men in Mbaitoli LGA, Imo State, based on age. Data answering this question are presented in Table 4.

TABLE 4: DIFFERENCE IN THE LEVEL OF KNOWLEDGE OF RISK FACTORS OF PROSTATE CANCER BASED ON AGE

Age (years)	N	Knowledge (%)	Descriptive interpretation
40–49	74	49.96	Moderate Knowledge
50–59	218	53.77	Moderate Knowledge
60 and above	104	55.77	Moderate Knowledge
Total	396	53.16	Moderate Knowledge

Note: 0–39% = Poor Knowledge; 40–69% = Moderate Knowledge; $\geq 70\%$ = Good Knowledge.

Table 4 shows that men aged 60 years and above had the highest level of knowledge of risk factors of prostate cancer (55.77%), followed by men aged 50–59 years (53.77%), while men aged 40–49 years had

the lowest level of knowledge (49.96%). The overall level of knowledge across all age brackets was 53.16%, indicating a generally moderate level of knowledge of risk factors of prostate cancer among men in Mbaitoli LGA irrespective of age.

TABLE 5: SUMMARY OF CHI-SQUARE TEST OF HYPOTHESIS ($\alpha = 0.05$)

Hypothesis (H0)	χ^2 calc.	df	χ^2 crit.	Decision
No significant difference in knowledge of risk factors of prostate cancer based on age	8.26	2	5.991	Reject H0*

*Significant at $p < 0.05$ (calculated χ^2 exceeds the critical value).

Table 5 shows that the calculated chi-square value of 8.26 was greater than the critical value of 5.991 at 2 degrees of freedom. The null hypothesis was therefore rejected, indicating a statistically significant difference in the level of knowledge of risk factors of prostate cancer among men in Mbaitoli LGA, Imo State, based on age.

IV. DISCUSSION

The findings are discussed below in line with the three objectives and research questions that guided the study.

A. Level of Knowledge of Risk Factors of Prostate Cancer (Research Question One)

Respondents recorded an overall moderate knowledge (53.2%) of prostate cancer risk factors. This finding aligns with the observation in Kigali, Rwanda, where the level of general awareness of prostate cancer was high, but knowledge of specific risk factors remained comparatively low [4], suggesting that awareness of a disease's existence does not automatically translate into accurate knowledge of what causes it. Respondents in Mbaitoli LGA correctly identified exposure to pesticides and chemicals and prostatitis as risk factors most often (79.0% each), but far fewer recognised family history (35.4%) or poor hydration (31.6%) as risk factors, pointing to specific gaps that community health education should target.

B. Practices Towards Prostate Cancer Prevention (Research Question Two)

Preventive practice was generally poor ($\bar{x} = 2.25$ of a 4-point scale) across the sample, a finding consistent with the poor practice reported among men in Saudi Arabia despite adequate awareness of the disease [2]. Participation in prostate cancer screening recorded the lowest practice score ($\bar{x} = 1.77$), even though abstaining from sexual activity ($\bar{x} = 2.82$), avoiding farm chemicals ($\bar{x} = 2.78$) and physical exercise ($\bar{x} = 2.51$) reached the good-practice threshold. This pattern mirrors the knowledge-practice gap reported among Rwandan men, where screening uptake (49.5%) lagged well behind awareness of the disease (80%) [12], and underscores that moderate knowledge of risk factors in Mbaitoli LGA has not

been matched by adequate preventive action, particularly around screening.

C. Difference in Knowledge of Risk Factors Based on Age (Research Question Three)

Men aged 60 years and above recorded the highest level of knowledge (55.77%), followed by those aged 50–59 years (53.77%), while men aged 40–49 years recorded the lowest level of knowledge (49.96%). This finding departs from the Zambian finding that increased knowledge, rather than age itself, was the factor independently associated with screening uptake [7], and may instead reflect the cumulative effect of repeated exposure to health information and personal experience of ageing-related urinary symptoms among older men in Mbaitoli LGA. The chi-square analysis confirmed that this difference was statistically significant ($\chi^2 = 8.26$, $df = 2$, $p < 0.05$), indicating that age is a meaningful demographic predictor of what men in Mbaitoli LGA know about prostate cancer risk factors. This is consistent with the Health Belief Model's proposition that perceived susceptibility, which tends to rise with age and personal proximity to a health threat, shapes how much relevant health information an individual retains and acts upon.

V. CONCLUSION AND RECOMMENDATIONS

Men in Mbaitoli LGA, Imo State, Nigeria, have a moderate knowledge of prostate cancer risk factors but exhibit generally poor preventive practices, particularly with regard to screening. Knowledge of risk factors differed significantly by age, with older men recording higher knowledge levels than younger men, indicating that age is a meaningful determinant of what men in the area know about the disease. Left unaddressed, the gap between moderate knowledge and poor practice may continue to contribute to late presentation, higher morbidity, and preventable mortality from prostate cancer in the study area.

Based on these findings, it is recommended that: (i) community-based health education programmes on prostate cancer be implemented in Mbaitoli LGA using local languages and culturally appropriate channels, with particular attention to men aged 40–49

years who recorded the lowest level of knowledge; (ii) periodic mobile PSA screening clinics be organised to improve access for men in the constituent villages, given that screening recorded the lowest preventive-practice score in the study; (iii) free or subsidised screening be provided for men aged 40 years and above, particularly those with a family history of the disease; (iv) local healthcare workers and primary care providers be given additional training on prostate cancer prevention, early detection, and treatment; and (v) follow-up studies be conducted after the implementation of awareness and screening programmes to evaluate their effectiveness and guide continuous improvement of public health strategies in the area.

REFERENCES

- [1] Adeloye, D., David, R. A., Aderemi, A. V., Iseolorunkanmi, A., Oyedokun, A., Iweala, E. E. J., Omoregbe, N., & Ayo, C. K. (2016). An estimate of the incidence of prostate cancer in Africa: A systematic review and meta-analysis. *PLOS ONE*, 11(4), e0153496. [Crossref](#)
- [2] Allothman, A. M., Altamimi, A. F., Alhenaki, A. W., Al-Qahtani, S. A., Al-Hazzaa, H. R., & Shorman, S. A. (2022). The knowledge and attitude towards prostate cancer and screening practices among males in Saudi Arabia. *Journal of Family Medicine and Primary Care*, 11(6), 2637–2642. [Crossref](#)
- [3] American Cancer Society. (2021). Prostate cancer risk factors. *American Cancer Society*. Retrieved from <https://www.cancer.org>
- [4] Benurugo, G., Munyambaraga, E., Chironda, G., & Bisanukuri, E. (2020). Awareness on prostate cancer and screening practices among men attending outpatient at a referral hospital in Kigali, Rwanda: A quantitative study. *International Journal of Africa Nursing Sciences*, 13, 100241. [Crossref](#)
- [5] Cirne, A. P. S., Santos, I. S., Silva, R. D., et al. (2022). Modifiable risk factors for prostate cancer in low- and lower-middle-income countries. *Journal of Global Oncology*, 8, 340–348.
- [6] Fidelis, M. N., Oparah, J. S., Nwaobiala, C. J., & Kalu, M. O. (2023). Awareness of the preventive measures of prostate cancer among secondary school teachers in Mbaitoli L.G.A, Imo State, Nigeria. *International Journal of Research in Education, Humanities and Commerce*, 4(2). [Crossref](#)
- [7] Gift, S., Nancy, K., & Victor, M. (2020). Assessment of knowledge, practice, and attitude towards prostate cancer screening among male patients aged 40 years and above at Kitwe Teaching Hospital, Zambia. *African Journal of Urology*, 26, 70. [Crossref](#)
- [8] International Agency for Research on Cancer. (2021). *GLOBOCAN 2020: Nigeria fact sheet*. World Health Organization.
- [9] Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement*, 30(3), 607–610. [Crossref](#)
- [10] National Population Commission. (2006). *2006 population and housing census of the Federal Republic of Nigeria: Priority tables*. National Population Commission.
- [11] Nair-Shalliker, V., Bang, A., Weber, M., & Armstrong, B. K. (2018). Factors associated with prostate specific antigen testing in Australians: Analysis of the New South Wales 45 and Up Study. *Scientific Reports*, 8(1), 4261. [Crossref](#)
- [12] Ogbazi, J. N., & Okpala, J. (1994). *Writing research report: Guide for research proposal and thesis writing*. Africana-Fep Publishers.
- [13] Onyeodi, I. A., Akintelure, S., Oladipo, A. T., et al. (2022). Knowledge, attitude, and screening practices of prostate cancer among men in an urban community in Lagos, Nigeria. *Journal of Community Medicine and Primary Health Care*, 34(1), 82–94.
- [14] Opara, A. U., Uloneme, G. C., Nwankpa, P., Akukwu, D., & Ekezie, J. (2015). Prevalence of some identified prostate problems among people resident in Imo State, Nigeria. *IJRDO - Journal of Biological Science*, 1(6), 1–8. [Crossref](#)
- [15] Sung, H., Ferlay, J., Siegel, R. L., Laversanne, M., Soerjomataram, I., Jemal, A., & Bray, F.

(2021). Global cancer statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA: A Cancer Journal for Clinicians*, 71(3), 209–249. [Crossref](#)