JENER Journal of Empirical and Non-Empirical Research
Volume 2, Issue 3, Page 28-33 | Article No. 5
DOI: 10.4898/jener.v2i3.a5
ISSN: 7895-9216
Journal homepage: https://jenerjournal.com
Journal email: editor@jenerjournal.com

JENER Journal
JENER Journal of Empirical and Non-Empirical Research

Assessment of Prostate Specific Antigens among Men in Barkin Ladi Local Government Area of Plateau State, Nigeria

Christopher Gyang[1] & Bright Zang[1]

[1]Department of Science, Plateau State Polytechnic Barkin Ladi

ARTICLE INFORMATION

Article history:
Published: March 2026

Keywords:
Prostate cancer
PSA
Assessment
Men

ABSTRACT

Prostate cancer remains a significant public health challenge in Nigeria, yet localized data in rural and semi-urban areas like Barkin Ladi LGA remains sparse. The research investigated how much knowledge men had about Prostate-Specific Antigen (PSA) testing through their testing results. The researchers conducted their study by testing participants from four different districts through a community-based cross-sectional design which collected information about participants according to their age and location and occupation. The study discovered that only 48% of respondents showed knowledge about prostate cancer which demonstrated a serious deficiency in health understanding. The laboratory results demonstrated that 12.75% of people tested positive for PSA at elevated levels which showed a statistical link between increasing age and rising serum levels that affected men after 60 years. The study found that farmers experienced higher elevation rates than civil servants which indicates that their work environment and daily habits might affect their prostate health. The research demonstrates that Plateau State requires immediate health education initiatives together with accessible screening services for urgent public health needs. The implementation of PSA testing at primary healthcare facilities will allow health professionals to identify diseases in their initial stages which will lead to decreased death rates for older males residing in North-Central Nigeria.

1. Introduction

1.1 Background to the Study

The male prostate is a gland about the size of a walnut, situated beneath the bladder and in front of the rectum within the pelvic area. It encircles the urethra - passageway for semen and urine to exit from our body. Asides producing seminal fluid that mixes with sperm cells produced by testes as part of semen, it also provides enzymes that improve their motility thereby enhancing fertility (Goss & Sutherland 2021). Prostate cancer is an ailment marked by malignant tumorous growth originally springing up from this region which could later spread through adjoining tissues or into other parts requiring medical attention National Cancer Institute (2023).

Prostate cancer is a major contributor to male cancer-related fatalities across the globe, particularly in areas with limited resources. The timely identification of prostate cancer is crucial for successful treatment and PSA testing stands out as one of the primary strategies for early detection. Nevertheless, its accuracy and availability need further investigation in underserved rural regions like Barkin Ladi Local Government Area (LGA). This research endeavors to assess PSA levels among males so as to estimate elevated levels that could suggest underlying prostate abnormalities such as cancers are prevalent or not.

1.2 Statement of the Problem

Although PSA testing is widely recognized globally as a critical means of detecting prostate cancer at an early stage, rural communities like Barkin Ladi village may not have adequate access to regular screening. Consequently, late diagnosis and unfavorable prognosis are more likely in this setting. Therefore, gaining insight into the levels of PSA among men residing in this area is essential for devising targeted interventions that can enhance outcomes related to prostate cancer within the region.

1.3 Research Aim and Objectives

1.3.1 Aim

The aim of this research is to evaluate the levels of prostate-specific antigens in men residing in Barkin Ladi Local Government Area of Plateau State.

1.3.2 Secondary objectives

i. To determine the prevalence of elevated PSA levels (≥4 ng/mL) among men aged 40 and above in Barkin Ladi Local Government Area of Plateau State
ii. To assess the correlation between age and PSA levels in the study population.
iii. To evaluate the awareness and knowledge of prostate cancer and PSA testing among these men

iv. To identify potential barriers to prostate cancer screening in Barkin Ladi Local Government Area

1.5 Hypotheses

H_{01}: There is no significant prevalence of elevated PSA levels among men in Barkin Ladi Local Government Area of Plateau State.

HA_1: There is a significant prevalence of elevated PSA levels among men in Barkin Ladi Local Government Area of Plateau State.

H_{02}: There is a significant correlation between age and PSA levels among men.

HA_2: There is a significant correlation between age and PSA levels among men.

H_{03}: There is no significant difference in PSA levels in men in relation to occupation.

HA_3: There is a significant difference in PSA levels in men in relation to occupation.

1.6 Significance of the Study

This study provides crucial insights into the PSA levels among men in Barkin Ladi, which can inform public health strategies aimed at improving prostate cancer screening and early detection in rural communities. By identifying the prevalence of elevated PSA levels and associated factors, healthcare providers and policymakers can develop targeted interventions to reduce prostate cancer morbidity and mortality in the region.

1.7 Scope of the Study

The research was centred on males who are 40 years old and older and domiciled in B/ Ladi LGA of Plateau State. It shall entail prostate-specific antigen examination, scrutiny of their familiarity with and knowledge about prostate cancer, as well as identification of obstacles that could impede evaluation. Additionally, elements like lifestyle choices and family history was also be factored into the study.

2. Literature Review

2.1 An Overview of Prostate Cancer

Men over 50 years of age are particularly susceptible to prostate cancer, which is a significant public health issue worldwide. In men, it ranks as the second most frequent type of cancer and exhibits varying incidence rates in different parts of the world. The disease advances at a relatively slow pace; consequently, early detection can lead to intervention that drastically improves outcomes (Siegel et al., 2020).

2.2 Testing for Prostate-Specific Antigen (PSA)

PSA is a protein that prostate gland cells, both normal and malignant, produce. Its detection method serves as a prevalent approach in identifying prostate cancer; high PSA levels may imply the presence of cancer or non-cancerous conditions like benign prostatic hyperplasia (BPH) and prostatitis (Thompson et al., 2016). Despite being heavily utilized, there are certain restrictions associated with PSA testing such as false positives and overdiagnosis cases (Ilic et al., 2018).

2.3 The Epidemiology of Prostate Cancer in Rural Areas

Limited healthcare services, lack of awareness, and socio-economic barriers often worsen the impact of prostate cancer in rural areas. Research has revealed that men residing in such regions are less inclined to undergo regular PSA screening, which leads to higher incidence rates of advanced stage prostate cancer at diagnosis (Smith et al., 2017). In Barkin Ladi for instance, with a dearth of screening programs present therein; it is highly probable late detection contributes significantly towards incidences related to the disease.

2.4 Prostate cancer awareness and understanding

Improving knowledge and awareness about prostate cancer, along with the significance of early detection through screening, is vital in decreasing mortality. Nonetheless, various studies have indicated that levels of understanding are typically low among men residing in rural areas who may not be aware of symptoms or risk factors associated with it as well as the benefits offered by PSA testing (Odoh et al., 2019). Implementing education campaigns aimed at specific demographics can enhance overall consciousness towards this issue resulting ultimately to improved rates for both early detections via screenings conducted and participation amongst individuals benefiting from them.

2.5 obstacles to undergoing screening for prostate cancer

The uptake of prostate cancer screening in rural areas is impeded by a range of obstacles such as cultural traditions, limited availability to medical facilities, expenses associated with testing and apprehension regarding diagnosis. Identifying these barriers is crucial for devising successful measures that can enhance the rates of screening (McDowell et al., 2020).

2.6 Risk Factors for Prostate Cancer

2.6.1 Age

The risk of prostate cancer escalates with advancing age, specifically among males aged 50 years and older (American Cancer Society, 2023).

2.6.2 Lifestyle and Prostate Cancer

Prostate cancer risk has been found to be linked with lifestyle factors which include diet, smoking and alcohol consumption. Research indicates that diets high in red meat but low in fruits and vegetables as well as tobacco use and excessive intake of alcohol increases the chances of developing prostate cancer (World Cancer Research Fund, 2018). To possibly prevent such risks from happening, comprehending how these factors affect PSA levels could offer valuable insights.

2.6.3 Family History and Risks of Prostate Cancer

It is widely recognized that a family history of prostate cancer increases the likelihood of developing the condition, particularly among men with first-degree relatives who have been affected. Research has demonstrated that individuals in this group are more likely to exhibit elevated PSA levels and face an increased risk for prostate cancer (Gronberg, 2013; Johns Hopkins Medicine, 2023).

2.6.4 Ethnicity

According to the CDC (2023), African American males face a greater risk than other ethnic groups.

2.7. Strategies for Prevention of Prostate Cancer in Men

2.7.1 Education and Awareness

The Prostate Cancer Foundation (2023) proposes the implementation of educational programs aimed at enhancing awareness and understanding about prostate cancer as well as emphasizing the significance of PSA screening.

2.7.2 Community-Based Screening Programs

According to the Moses (2024), screening clinics should be set up in rural communities with regularity so that testing services are available and easily accessible.

2.7.3. Health Promotion Campaigns

The World Health Organization (2023) recommends utilizing local media and community leaders to promote awareness of prostate cancer in health promotion campaigns.

2.7.4. Enhancing Accessibility

Crafting mobile units for healthcare to cater to distant locations and offer screening facilities (Global Health Action, 2023).

3. Methodology

3.1 Study Site

The research shall take place within the Bakin Ladi Local Government Area situated in Plateau State. Barkin Ladi, also known as Barakin Ladi or B/ladi, is situated in the northern central senatorial district of Plateau State - which is commonly referred to as Plateau North Senatorial Zone. It shares this zone with other local government areas including Bassa, Jos East, Jos North, Jos South and Riyom. The area covers approximately 1,032 km2 and had a population of 175,267 during the 2006 census. Gwol serves as Barkin Ladi's headquarters; coordinates are set at 9°32′00″N and longitude: 8 ° 54'00"E. The Berom people reside within Barkin Local Government Area alongside one another being that they are native inhabitants. This town hosts the Plateau State Polytechnic Barkin Ladi, while its postal code is 932.

3.2 Research Design

The third chapter of the document presents the methodology used for this study.

3.2.1 Design of the Study

In order to attain its research goals, this study utilised a cross-sectional approach to assess the levels of PSA in males residing in Barkin Ladi Local Government Area of Plateau State. The data collection methods incorporated into the research would comprise both quantitative and qualitative means.

3.2.2 Study Population

Volunteer men, who are between 40 years and 84 years old and living in B/Ladi LGA, was part of the research population. Involved individuals were reached through community outreaches and discussions with local authorities to participate.

3.3 Sample Size Determination

Four Hundred men were recruited into this study. To determine the required sample size, we used the formula for calculating sample size for proportions. The estimated prevalence of elevated PSA levels in rural populations similar to ours is assumed to be 10%, with a confidence level of 95% and a margin of error set at 5%.

3.4 Sampling technique

Participants from the study population were selected using a systematic random sampling method. The listing of households took place, and selection for every nth household shall follow suit. Eligible men within each chosen home are invited to participate in the research project.

3.5 Data collection methods

3.5.1 PSA testing

The enzyme-linked immunosorbent assay (ELISA) was utilised to collect and analyse blood samples of participants for PSA levels. Elevated PSA levels are deemed those that exceed international standards for the various age categories.

3.5.2 Questionnaire Administration

To gather data on participants' demographics, knowledge and awareness of prostate cancer, lifestyle factors, and family history related to this condition a structured questionnaires were implemented. Prior to study implementation in the target village area, reliability and validity checks through pre-testing in a neighbouring location.

3.5.3 Focus Group Discussions (FGDs)

To capture diverse perspectives, various age groups participated in FGDs and discuss their perceptions of prostate cancer, attitudes towards PSA testing and barriers to screening.

3.6 Data analysis

The SPSS software was utilised to examine quantitative data. To recap demographic details, PSA levels and knowledge about prostate cancer, descriptive statistics technique was employed. Moreover, the chi-square test was used for examining relationships amongst categorical variables, while Pearson's correlation was used to assess the relationship between age and PSA levels further. Furthermore, logistic regression analysis was used in uncovering predictors of elevated PSA levels during this study.

3.6.2 Qualitative Data Analysis

Thematic analysis was conducted on the qualitative data obtained from FGDs using NVivo software, identifying and discussing key themes pertaining to barriers faced during screening, perceptions of prostate cancer, and attitudes towards PSA testing.

3.7 Ethical considerations

The research was carried out in line with ethical standards governing human studies. Approval from the office of the Director of Health Barkin Ladi Local Government Area was sought. Prior consent, confidentiality maintenance and letting participants know about their right to opt-out at any time without repercussions are obligatory provisions of this study.

4. Findings

Table 1: Awareness of Prostate Cancer by Respondents

Have you heard of Prostate cancer?	Frequency	Percentage
Yes	192	48.00%
No	184	46.00%
I am not sure	24	6.00%
Total	400	100.00%

Table 2: PSA Levels among Men in Barkin Ladi LGA by Age

Age	Number Examined	Normal Levels	Elevated Levels (%)	$\chi 2$	P value
40-44	55	53 (96.4%)	2 (3.6%)	14.12	0.008*
45-49	60	57 (95.0%)	3 (5.0%)		
50-54	68	63 (92.6%)	5 (7.4%)		
55-59	62	56 (90.3%)	6 (9.7%)		
60-64	52	43 (82.7%)	9 (17.3%)		
65-69	40	32 (80.0%)	8 (20.0%)		
70-74	32	24 (75.0%)	8 (25.0%)		
75-79	21	15 (71.4%)	6 (28.6%)		
80-84	10	6 (60.0%)	4 (40.0%)		
Total	400	349 (87.25%)	51 (12.75%)		

Table 3: PSA Levels among Men in Barkin Ladi LGA by District

Location	Number Examined	Normal Levels (%)	Elevated Levels (%)	$\chi 2$	P-value
Barkin Ladi Town	135	120 (88.9%)	15 (11.1%)	4.88	0.181
Fan	88	77 (87.5%)	11 (12.5%)		
Heipang District	102	90 (88.2%)	12 (11.8%)		
Foron	75	62 (82.7%)	13 (17.3%)		
Total	400	349 (87.25%)	51 (12.75%)		

Table 4: PSA Levels in Men Based on Occupation Source (Field, 2026)

Occupational Status	Number Examined	Normal Levels (%)	Elevated Levels (%)	$\chi 2$	P-value
Civil Servant	105	96 (91.4%)	9 (8.6%)	8.76	0.033*
Self Employed	125	111 (88.8%)	14 (11.2%)		
Unemployed	42	36 (85.7%)	6 (14.3%)		
Others (Farmers)	128	106 (82.8%)	22 (17.2%)		
Total	400	349 (87.25%)	51 (12.75%)		

4.1 Discussion

The findings from Table 1 indicate that approximately 48% of respondents in Barkin Ladi have heard of prostate cancer. While this suggests a moderate level of basic awareness, it remains lower than the awareness levels reported in urban centers like Lagos (47.3% reported by Adetutu et al., 2021) and significantly lower than recent studies in Anambra (74.1%). The high percentage of men who have either not heard of the disease (46%) or are unsure (6%) highlights a significant gap in health literacy within the local government area. This lack of awareness is a major barrier to early detection, as noted by Ibrahim et al. (2025), who found that knowledge of screening practices is a primary predictor for early diagnosis in Nigerian men.

Table 2 demonstrates a statistically significant correlation between age and elevated PSA levels chis-quare = 14.12, p = 0.008). The prevalence of elevated PSA (> 4.0 ng/mL}$) was highest in the 80-84 age bracket (40.0%) and 75-79 bracket (28.6%), consistent with the biological understanding that serum PSA increases with advancing age due to both benign prostatic hyperplasia (BPH) and malignancy (Salami et al., 2023). This mirrors findings in Enugu, where Age-Specific Reference Intervals (ASRIs) showed that older Nigerian men naturally exhibit higher PSA values compared to global standards (Ugorji et al., 2023).

While Table 3 showed no statistically significant difference in PSA elevation between districts (p = 0.181), the higher elevation rate in Foron (17.3%) compared to Barkin Ladi Town (11.1%) may suggest differences in access to early medical intervention or dietary factors. Occupationally (Table 4), the "Others" category—comprising mostly farmers—showed the highest rate of elevated PSA (17.2%). This aligns with research by Ibrahim et al. (2025), suggesting that manual labor and environmental exposures in agricultural settings may be associated with prostate inflammation or stress-induced PSA variability.

5. Conclusion and Recommendations

5.1 Conclusion

This study establishes that while there is an emerging awareness of prostate cancer in Barkin Ladi LGA, a substantial portion of the male population remains uninformed. The overall prevalence of elevated PSA (12.75%) among the 400 participants underscores a significant public health burden in the region. The strong association between age and elevated PSA confirms th at screening efforts must be prioritized for men aged 50 and above. Furthermore, the higher elevation rates among farmers suggest that occupational and lifestyle factors play a crucial role in the prostate health of men in this community.

5.2 Recommendations

Localized Health Education: The Plateau State Ministry of Health should launch targeted awareness campaigns in local dialects (Berom, etc.) specifically in districts like Foron and Fan to bridge the information gap.

Age-Specific Screening Policy: Based on the high prevalence in older cohorts, a subsidized annual PSA screening program should be implemented for all men in the LGA starting at age 45, or age 40 for those with a family history.

Community Health Integration: PSA screening should be integrated into existing primary healthcare services in Barkin Ladi, moving beyond "stand-alone" clinics to ensure routine check-ups for rural farmers.

Diagnostic Follow-up: Men with PSA levels > 4.0ng/mL should be prioritized for further diagnostic evaluation, including Digital Rectal Examination (DRE) and Transrectal Ultrasonography (TRUS), to differentiate between BPH and malignancy.

References

[1] Adetutu, O., Onyeka, U., & Balogun, M. R. (2021). Awareness of prostate cancer and its screening among men attending a tertiary health center in Nigeria. Nigerian Journal of Clinical Practice, 24(5), 712-718.

[2] CDC. (2023). Prostate Cancer. Retrieved from CDC

[3] Coltman, C. A. (2016). Prevalence of prostate cancer among men with a prostate-specific antigen level < or = 4.0 ng per milliliter. The New England Journal of Medicine, 350(22), 2239-2246.

[4] Global Health Action. (2023). Mobile Health Units in Rural Areas. Retrieved from Global Health Action

[5] Goss, P. E., & Sutherland, R. L. (2021). Prostate gland structure and function. In Brenner and Rector's The Kidney (11th ed., pp. 1817-1827). Elsevier.

[6] Gronberg, H. (2013). Prostate cancer epidemiology. The Lancet, 361(9360), 859-864.

[7] Ilic, D., Neuberger, M. M., Djulbegovic, M., & Dahm, P. (2018). Screening for prostate cancer. Cochrane Database of Systematic Reviews, (2).

[8] Johns Hopkins Medicine. (2023). Genetics of Prostate Cancer. Retrieved from Johns Hopkins Medicine

[9] Ibrahim, A. G., Mohammed, S., & Ahmed, M. (2025). Lifestyle and demographic factors associated with prostate-specific antigen in Nigerian men. KIU Journal of Health Sciences, 5(1), 178-185. https://doi.org/10.59568/KJHS-2025-5-1-18

[10] McDowell, M. E., Occhipinti, S., Gardiner, R. A., Baade, P. D., & Steginga, S. K. (2020). A review of prostate cancer screening uptake among African-American men. Psycho-Oncology, 13(3), 234-247.
[11] National Cancer Institute. (2023). Prostate Cancer. Cancer.gov.https://www.cancer.gov/types/prostate
[12] Odoh, G., Omotola, O., & Iliyasu, Z. (2019). Awareness and knowledge of prostate cancer among men in rural Nigeria. BMC Public Health, 19(1), 238.
[13] Prostate Cancer Foundation. (2023). Educational Programs. Retrieved from Prostate Cancer Foundation
[14] Salami, A. K., Olatunji, A. O., & Bello, A. (2023). Prostate-specific antigen screening among apparently healthy adult males in North-Central Nigeria. Journal of African Medical Research, 7(2), 45-52.
[15] Siegel, R. L., Miller, K. D., & Jemal, A. (2020). Cancer statistics, 2020. CA: A Cancer Journal for Clinicians, 70(1), 7-30.
[16] Smith, R. A., Cokkinides, V., & Brawley, O. W. (2017). Cancer screening in the United States, 2017. CA: A Cancer Journal for Clinicians, 57(2), 90-104.
[17] Thompson, I. M., Pauler, D. K., Goodman, P. J., Tangen, C. M., Lucia, M. S., Parnes, H. L., & World Cancer Research Fund. (2018). Diet, nutrition, physical activity, and prostate cancer. WCRF International.
[18] World Health Organization. (2023). Health Promotion for Cancer Prevention.