Prostate Cancer Screening Among Male Patients that Attended Madonna Catholic Hospital in Umuahia, Abia State from 2020-2024

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ABSTRACT

Background: Prostrate cancer is a leading health concern among men, with increasing global incidence and mortality especially in low and middle-income countries. Despite its impact, limited data exist on PSA screening trends and influencing factors in Southeast Nigeria, particularly Umuahia, highlighting the need for localized evidence to improve early detection and intervention.

Aim: The main objective of this work is focused on studying of prostate cancer screening among male patients that attended Madonna Catholic Hospital in Umuahia, Abia State from 2020-2024.

Method: A retrospective study was used to identify patients who attended the hospital between 2020-2024 and had a diagnosis of prostate cancer or underwent prostate related procedures. Stratified sampling was used to divide the study population into strata based on age groups and year of admission. Systematic sampling was used to select every patient from each stratum.

Results: The findings reveal an upward trend in screening uptake, rising from 88 participants in 2020 to 202 in 2024, with a total of 594 men screened over five years. The majority were aged 50–69 years (63.8%), aligning with global prostate cancer risk profiles. Elevated prostate-specific antigen (PSA) levels (?4 ng/mL) were observed in 54.2% of participants, indicating a high burden of potential late-stage disease.

Conclusion: The study highlights the need for age and comorbidity sensitive prostate cancer in Nigeria emphasizing hypertension's role and urging context-specific guidelines to improve early detection and health outcomes.

Keywords: Prostate cancer, PSA screening, hypertension, comorbidity, Nigeria.

INTRODUCTION

Prostate cancer is a very common form of cancer affecting men worldwide and is considered a major health problem due to its high incidence, mortality, and treatment costs. It is the second most common cancer among men globally and a leading cause of cancer-related mortality, particularly in low- and middle-income countries (LMICs). In 2020, approximately 1.4 million new cases and 375,000 deaths were recorded worldwide (Sung et al., 2021). Forecasts suggest the global burden may more than double by 2040, from 1.4 million new cases in 2020 to 2.9 million by 2040 with deaths expected to increase by approximately 85%, with LMICs bearing a disproportionate share due to aging populations and limited screening infrastructure (Pilleron et al., 2023).

Prostate cancer is characterized by the uncontrolled proliferation of cells within the prostate gland, which is

situated beneath the bladder in the male reproductive system (Leslie et al., 2023). Screening tests, particularly blood tests measuring prostate-specific antigen (PSA) levels, typically identify abnormal prostate tissue growth. PSA is produced by prostate epithelial cells and its elevated levels in blood can indicate prostate cancer or benign conditions. (Merriel et al., 2022). A definitive diagnosis is made through a prostate biopsy, after which a pathologist assigns a Gleason score to the cancer. This score indicates the aggressiveness of the tumor, with higher scores indicating more severe cases (Sharma & Miyamoto, 2018). Medical imaging techniques are utilized to assess whether the cancer has metastasized beyond the prostate (Zhu et al., 2023). Based on the Gleason score, PSA levels, and imaging findings, the cancer is staged from 1 to 4, with higher stages indicating more advanced disease (Sharma & Miyamoto, 2018).

Epidemiological studies have identified several risk factors associated with prostate cancer, including age, family history, race, and genetic predispositions. The incidence of prostate cancer rises significantly after age 50, with the average age of diagnosis being around 67 years (Siegel et al., 2023). Men of African descent are at a higher risk of developing prostate cancer than their Caucasian counterparts, which may be linked to genetic and environmental factors (American Cancer Society, 2023).

Adewale (2022), conducted a descriptive study of prostate lesions in the largest hospital in Ondo State, Nigeria, and found that all cases of benign prostatic hyperplasia accounted for 32.2%, nodular hyperplasia was 29.7%, prostate cancers were 30.7%, and other lesions accounted for 7.4%. Although the exact cause of prostate cancer is unknown, older age (over 50), family history of prostate cancer, and African-American ethnicity are believed to be risk factors. Unfortunately, many cancer victims are diagnosed late with tumor that cannot be cured, which could have been avoided if accurate information on early diagnosis had been known to the public. Additionally, lack of awareness about prostate cancer has been identified as a cause of late detection and poor survival. Therefore, knowledge about prostate cancer and cancer screening is essential for effective use of cancer screening services.

Despite these insights, there is a significant knowledge gap regarding PSA screening patterns in private health facilities in Southeast Nigeria, especially Umuahia. To our knowledge, no studies have documented the number of men screened, their sociodemographic profiles, PSA value distributions, or factors influencing PSA levels in selected private clinics over multiple years. Addressing this gap is important for improving early detection, tailored interventions, and informing evidence-based screening and policy decisions.

METHODOLOGY

A retrospective study was used to identify patients who attended the hospital between 2020-2024 and had a diagnosis of prostate cancer or underwent prostate related procedures. Stratified sampling was used to divide the study population into strata based on age groups and year of admission. Systematic sampling was used to select every patient from each stratum. The population of the study consists of all male patients who attended Madonna catholic hospital in Umuahia, Abia State, from 2020 to 2024. A total of 594 respondents were used in this work, which was a total number gotten from the field research.

Method of Data Collection

Data collection involved patient records from Madonna Catholic Hospital in Umuahia, Abia State. The data was collected from available laboratory records after obtaining permission from the labs.

Instrument for Data Collection

The instrument for collection of data was a well-structured proforma which was used to collect relevant variables from patient records, including: **Demographic information**: Age, occupation, socioeconomic

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status, which includes Gleason scores, number of screened patients, symptoms and factors that influence number of prostate cancer patients.

Method of Data Analysis

Descriptive Statistics was used to calculate frequencies, proportions, and averages for demographic data, stages at diagnosis, and Gleason scores. Data was cleared, coded, entered and analysed using statistical package for the social sciences (SPSS) version 20. All analysis of the data were conducted and reviewed in the inferential statistics; the chi square test was used to check for the association between the demographic factors and the PSA levels.

Ethical Clearance

Ethical approval letter was obtained from Abia state University Ethical committee. Respondents were informed of their voluntarism to participate in the study confidentiality and anonymity of data collected.

RESULTS AND DISCUSSION

Number of Male Patients that were Screened

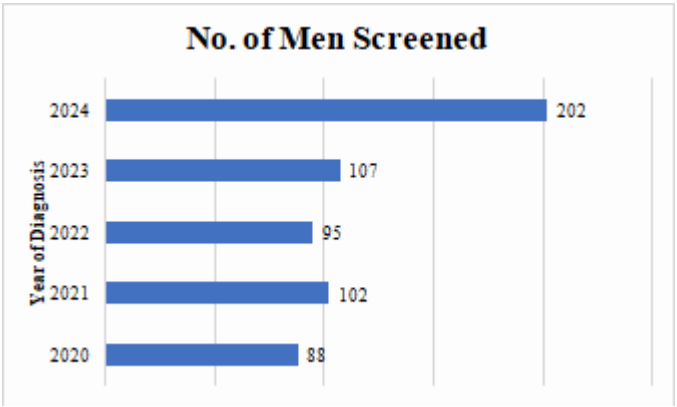

Fig. 1: Number of male patients that were screened for Prostate Cancer in Madonna Catholic Hospital in Umuahia, Abia State.

Socio-demographic Profile of Patients

Table 1: Socio-Demographic Profile of Male Patients that were Screenedin Madonna Catholic Hospital Umuahia, Abia Statefrom 2020 to 2024.

	Year of Diagnosis					
Variables	**2020 (n=88)**	**2021 (n=102)**	**2022 (n=95)**	**2023 (n=107)**	**2024 (n=202)**	**Total (n=594)**
Age						
20-29 years	0 (0.0%)	3 (0.5%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	3 (0.5%)
30-39 years	0 (0.0%)	9 (1.5%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	9 (1.5%)
40-49 years	12 (2.0%)	8 (1.3%)	13 (2.2%)	18 (3.0%)	35 (5.9%)	86 (14.5%)

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50-59 years	25 (4.2%)	31 (5.2%)	27 (4.5%)	32 (5.4%)	60 (10.1%)	175 (29.5%)
60-69 years	30 (5.1%)	35 (5.9%)	34 (5.7%)	35 (5.9%)	70 (11.8%)	204 (34.3%)
70-79 years	15 (2.5%)	16 (2.7%)	17 (2.9%)	20 (3.4%)	37 (6.2%)	105 (17.7%)
? 80	6 (1.0%)	0 (0.0%)	4 (0.7%)	2 (0.3%)	0 (0.0%)	12 (2.0%)
Ethnicity						
Igbo	50 (8.4%)	58 (9.8%)	55 (9.3%)	65 (10.9%)	125 (21.0%)	353 (59.4%)
Yoruba	25 (4.2%)	14 (2.4%)	27 (4.5%)	30 (5.1%)	50 (8.4%)	146 (24.6%)
Hausa	13 (2.2%)	30 (5.1%)	13 (2.2%)	12 (2.0%)	27 (4.5%)	95 (16.0%)
Religion						
Christianity	64 (10.8%)	76 (12.8%)	68 (11.4%)	79 (13.3%)	150 (25.3%)	437 (73.6%)
Muslim	5 (0.8%)	26 (4.4%)	27 (4.5%)	28 (4.7%)	52 (8.8%)	138 (23.2%)
Other	19 (3.2%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	19 (3.2%)
Occupation						
Civil servant	40 (6.7%)	51 (8.6%)	47 (7.9%)	54 (9.1%)	100 (16.8%)	292 (49.2%)
Trader	30 (5.1%)	35 (5.9%)	33 (5.6%)	38 (6.4%)	70 (11.8%)	206 (34.7%)
Farmer	18 (3.0%)	16 (2.7%)	15 (2.5%)	13 (2.2%)	32 (5.4%)	94 (15.8%)
Others	0 (0.0%)	0 (0.0%)	0 (0.0%)	2 (0.3%)	0 (0.0%)	2 (0.3%)

Prostate Specific Antigen (PSA) Values of Male Patients

Table 2: Distribution of PSA Values by Year of Diagnosis among Male Patients that were Screened in Madonna Catholic Hospital Umuahia, Abia Statefrom 2020 to 2024.

PSA Value	2020 (n=88)	2021 (n=102)	2022 (n=95)	2023 (n=107)	2024 (n=202)	Total (n=594)
<4ng/ml (Normal)	40 (6.7%)	46 (7.7%)	41 (6.9%)	50 (8.4%)	95 (16.0%)	272 (45.8%)
?4ng/ml (Elevated)	48 (8.1%)	56 (9.4%)	54 (9.1%)	57 (9.6%)	107 (18.0%)	322 (54.2%)

Number of Male Patients with Diabetes and Hypertension

Table 3: Number of Patients with Diabetes and Hypertension by Year of Diagnosis among Male Patients that were Screened in Madonna Catholic Hospital Umuahia, Abia State from 2020 to 2024.

	2020 (n=88)	2021 (n=102)	2022 (n=95)	2023 (n=107)	2024 (n=202)	Total (n=594)
Diabetes Status						
Yes	35 (5.9%)	43 (7.2%)	42 (7.1%)	50 (8.4%)	74 (12.5%)	244 (41.1%)
No	53 (8.9%)	59 (9.9%)	53 (8.9%)	57 (9.6%)	128 (21.5%)	350 (58.9%)

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Hypertension Status						
Yes	45 (7.6%)	53 (8.9%)	53 (8.9%)	60 (10.1%)	104 (17.5%)	315 (53.0%)
No	43 (7.2%)	49 (8.2%)	42 (7.1%)	47 (7.9%)	98 (16.5%)	279 (47.0%)

Factors That Influence Prostate Specific Antigen (PSA) Values Of Male Patients

Socio-Demographic Factors

Table 4: Association Between Socio-demographic Factors and PSA Levels of Male Patients that were Screened in Madonna Catholic Hospital Umuahia, Abia State from 2020 to 2024.

Variable	**Category**	**PSA <4 ng/ml (n=272)**	**PSA ?4 ng/ml (n=322)**	**Total (n=594)**	**?² (df)**	**p-value**
Age	20–29 years	0 (0.0%)	3 (0.5%)	3 (0.5%)	102.685 (6)	**<0.001**
	30–39 years	0 (0.0%)	9 (1.5%)	9 (1.5%)		
	40–49 years	64 (10.8%)	22 (3.7%)	86 (14.5%)		
	50–59 years	108 (18.2%)	67 (11.3%)	175 (29.5%)		
	60–69 years	57 (9.6%)	147 (24.7%)	204 (34.3%)		
	70–79 years	32 (5.4%)	73 (12.3%)	105 (17.7%)		
	?80 years	11 (1.9%)	1 (0.2%)	12 (2.0%)		
Occupation	Civil servant	189 (31.8%)	103 (17.3%)	292 (49.2%)	102.446 (3)	**<0.001**
	Trader	40 (6.7%)	166 (27.9%)	206 (34.7%)		
	Farmer	41 (6.9%)	53 (8.9%)	94 (15.8%)		
	Others	2 (0.3%)	0 (0.0%)	2 (0.3%)		
Ethnicity	Igbo	114 (19.2%)	239 (40.2%)	353 (59.4%)	81.141 (2)	**<0.001**
	Yoruba	80 (13.5%)	66 (11.1%)	146 (24.6%)		
	Hausa	78 (13.1%)	17 (2.9%)	95 (16.0%)		
Religion	Christianity	150 (25.3%)	287 (48.3%)	437 (73.6%)	93.047 (2)	**<0.001**
	Muslim	112 (18.9%)	26 (4.4%)	138 (23.2%)		
	Other	10 (1.7%)	9 (1.5%)	19 (3.2%)		

Co-Morbidities

Table 5: Association between Comorbidities and PSA Levels of Male Patients that were Screened in Madonna Catholic Hospital Umuahia, Abia Statefrom 2020 to 2024.

Variable	**Category**	**PSA <4 ng/ml (n=272)**	**PSA ?4 ng/ml (n=322)**	**Total (n=594)**	**?² (df)**	**p-value**
Diabetes	Yes	110 (18.5%)	134 (22.6%)	244 (41.1%)	0.084 (1)	0.772
	No	162 (27.3%)	188 (31.6%)	350 (58.9%)		
Hypertension	Yes	130 (21.9%)	185 (31.1%)	315 (53.0%)	5.523 (1)	**0.019**
	No	142 (23.9%)	137 (23.1%)	279 (47.0%)		

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DISCUSSION OF FINDINGS

The study revealed significant annual growth in prostate cancer screening uptake at Madonna Catholic Hospital. Screening numbers increased progressively from 88 men (14.8%) in 2020 to 202 men (34.0%) in 2024, representing a 129% increase over the five-year period. Notably, 2024 alone accounted for more than one-third of all screenings conducted during the study, suggesting either improved program accessibility or successful awareness campaigns in the final study year.

The screened population predominantly consisted of older Igbo Christian men, with civil servants (49.2%) and traders (34.7%) forming the majority. Age distribution showed highest participation among patients aged 60-69 years (34.3%), followed by 50-59 years (29.5%). Younger age groups (20-39 years) showed minimal participation (<2% combined), indicating potential gaps in reaching younger at-risk populations.

Elevated PSA levels (?4ng/ml) were more prevalent (54.2%) than normal levels (45.8%), with this pattern consistent across all study years. Hypertension showed significant association with elevated PSA ($p=0.019$), present in 53.0% of patients. Diabetes prevalence was 41.1% but demonstrated no significant relationship with PSA values ($p=0.772$). Strong correlations were found between elevated PSA levels and older age (60-79 years, $p<0.001$); Igbo ethnicity ($p<0.001$); Christian religion ($p<0.001$); and trading occupation ($p<0.001$).

CONCLUSION

Prostate cancer is an increasingly significant public health challenge in Nigeria, with its incidence and mortality rates rising steadily over the past decades. Despite medical advances globally, Nigerian men continue to face numerous barriers that lead to late diagnosis and poor treatment outcomes. Factors such as low levels of awareness about the disease, cultural beliefs that discourage seeking healthcare, limited access to screening services, and high costs of treatment contribute heavily to the poor prognosis often observed.

This study provides important insights into prostate cancer screening patterns, demographic influences, and comorbidity associations among male patients at Madonna Catholic Hospital, Umuahia, from 2020 to 2024. The findings reveal a significant increase in screening uptake over the study period, with older men (aged 50–69 years) constituting the majority of participants. Elevated PSA levels (?4 ng/mL) were prevalent in 54.2% of screened individuals, with strong correlations observed among specific demographic groups, including Igbo ethnicity, Christian affiliation, and occupational categories such as traders. Hypertension demonstrated a significant association with elevated PSA, while diabetes showed no such relationship, highlighting the complex interplay between metabolic health and prostate cancer risk markers.

The study depicts the need for targeted screening strategies that account for age, ethnicity, and comorbid conditions in this population. The high prevalence of hypertension and its association with abnormal PSA values suggest that integrated health interventions addressing both cardiovascular and prostate health could improve early detection outcomes. Furthermore, the lack of significant PSA elevation among diabetic patients challenges findings from other regions, indicating potential population-specific variations that warrant further investigation.

These results advocate for the development of context-appropriate prostate cancer screening guidelines in Nigeria, incorporating demographic risk stratification and comorbidity assessments. Public health efforts should prioritize awareness campaigns for high-risk groups, particularly older men and those with hypertension, while ensuring access to confirmatory diagnostics for individuals with elevated PSA. Future research should explore longitudinal outcomes of screened patients, including biopsy correlation and survival rates, to validate the clinical significance of these findings. Ultimately, this study contributes to the

growing body of African prostate cancer research, providing evidence to guide policy and practice in resource-limited settings.

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