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REVIEW

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Clinicopathological features, management, and treatment outcome of prostate cancer in West and Central Africa: a systematic review

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Abstract

Background Prostate cancer represents a significant and growing global health disparity, with men of African descent experiencing the highest incidence and poorest survival outcomes worldwide. This systematic review aims to comprehensively synthesize the fragmented literature to determine the specific clinicopathological features, prevailing management strategies, and treatment outcomes of prostate cancer across the 25 nations of West and Central Africa (WCA).

Method A systematic review was conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses 2020 guidelines, encompassing primary research articles published between January 2010 and July 2025. Comprehensive searches were performed across Scopus, PubMed, and Web of Science, targeting country-specific data from WCA. Studies reporting on clinicopathological features, treatment modalities, or survival outcomes were included. Methodological quality was assessed using the Joanna Briggs Institute Critical Appraisal Checklist.

Result A total of 25 studies (16 case series, 7 cohorts, 2 quasi-experimental) were included, with the majority originating from Nigeria, Senegal, and Ghana. Clinicopathological features consistently demonstrated a late-stage presentation: mean/median Prostate-Specific Antigen levels frequently exceeded 100 ng/mL, and a significant proportion of cases were categorized as highly aggressive disease (Gleason Grade Group 4 and 5). Consequently, the predominant management strategy was palliative systemic therapy, primarily Androgen Deprivation Therapy, with curative local therapies (surgery/radiation) being infrequently reported.

Conclusion Prostate cancer in WCA is characterized by a worsening phenotype associated with a diagnosis at an advanced stage, leading to a management paradigm dominated by palliative care. Urgent, regionally-tailored public health interventions are required to establish effective early detection programs and bolster local oncology capacity to transition from palliative to curative intent treatment and improve survival outcomes.

Keywords Clinicopathological Features, Treatment Outcome, Prostate Cancer, West Africa, Central Africa, Systematic Review

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1 Introduction

Prostate cancer is a leading cause of cancer incidence and mortality globally, yet its burden is characterized by a stark and worsening global health disparity [1, 2]. This inequity is acutely concentrated in populations of African descent, who experience the highest incidence and the poorest survival outcomes worldwide, defining a critical gap in global oncology efforts [3, 4].

Within this disparity, the nations of West and Central Africa (WCA) represent an epicenter of prostate cancer crisis. In the African region, the Age-Standardized Mortality Rate for prostate cancer has been consistently reported as the highest globally, rising from 27.9 per 100,000 in 1990 to 32.9 per 100,000 in 2019, contrasting sharply with declining trends in High-Income Countries [1]. This catastrophic outcome is driven by a unique and aggressive clinical presentation: patients frequently present with exceptionally elevated Prostate-Specific Antigen (PSA) levels (often >100 ng/mL), a high prevalence of biologically aggressive disease (predominantly Gleason Grade Group 4 and 5), and advanced clinical stages (T3/T4 or metastatic disease) [5].

The widespread late-stage diagnosis is a product of systemic failures, including a lack of organized screening, protracted diagnostic delays, and inadequate oncology infrastructure [6]. This reality fundamentally shapes the therapeutic landscape: the majority of patients are ineligible for curative local interventions such as radical prostatectomy or definitive radiation therapy. Consequently, treatment is dominated by palliative systemic approaches, primarily Androgen Deprivation Therapy (ADT), resulting in suboptimal survival and a high incidence of Castration-Resistant Prostate Cancer (CRPC) [7, 8].

Despite the acknowledged clinical and public health urgency, the evidence base delineating the specific clinicopathological characteristics, the prevailing treatment constraints, and the subsequent survival outcomes across the 25 member nations of WCA remains highly fragmented, non-uniform, and geographically siloed. This fragmentation severely impedes the development of evidence-based, regionally tailored guidelines and hinders effective resource allocation from national and global health bodies [6].

This systematic review aims to comprehensively synthesize the literature published from 2010 to 2025 in order to determine the clinicopathological features, determine the prevailing treatment modalities, and determine the resulting patient outcomes associated with prostate cancer across the West and Central Africa.

2 Method

2.1 Study design and protocol

This systematic review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020) guidelines [9]. The review protocol was prospectively registered in an international database (Open Science Frame: https://osf.io/5fkq8/overview?view_only=4a2dcee440b149ac8525364de4c79c59**)** to ensure methodological transparency and minimize the risk of reporting bias. The research question was formulated using the Population, Exposure, Outcome framework, focusing on Prostate cancer patients, Exposure to West and Central African healthcare settings, and Outcomes encompassing clinicopathological features, treatment modalities, and survival data.

2.2 Eligibility criteria

The following inclusion and exclusion criteria were applied to select primary research articles published between January 1, 2010, and July 31, 2025.

2.3 Inclusion criteria

Study design: Original research articles, including retrospective and prospective cohort studies, case-control studies, cross-sectional studies, and case series involving a minimum of 20 prostate cancer cases.

Study population and geography: Studies must involve prostate cancer patients diagnosed and treated within a country geographically located in West or Central Africa, with the study population consisting predominantly of individuals of African descent.

Diagnosis and reporting: Diagnosis of prostate cancer must be confirmed histologically from biopsy or surgical specimens. Included studies must report on at least one of the primary outcomes:

1. Clinicopathological Features: Patient age at diagnosis, symptoms, serum PSA level at diagnosis, Gleason Grade Group distribution (preferably using ISUP 2014 or later classification), perineural invasion, lymphovascular invasion, clinical tumor stage (T-stage), or pathological stage (pT-stage).
2. Treatment and Outcome: Detailed information on primary treatment modalities (i.e. radical prostatectomy, radiotherapy, hormone therapy), recurrence rates, or survival outcomes (i.e. overall survival, disease-free survival).

Publication status and language: Full-text articles published in a peer-reviewed journal. Accepted languages were English, French, and Portuguese.

Timeframe: Studies published from January 1, 2010, to July 31, 2025, to ensure the data reflect current diagnostic and management standards.

2.4 Exclusion criteria

Study design: Systematic reviews, meta-analyses, editorials, letters to the editor, conference abstracts, case reports, or articles without a full-text version available. In vitro, in silico, or animal studies.

Geography and data: Studies conducted outside WCA. Multi-center studies were excluded if data specific to the African cohort could not be isolated.

Data insufficiency/overlap: Studies with fewer than 20 prostate cancer patients. Duplicate publications or those reporting on identical patient cohorts; in such cases, the most recent or most comprehensive publication was selected.

2.5 Search strategy and data sources

A comprehensive systematic literature search was performed across three major electronic bibliographic databases: Scopus, PubMed, and Web of Science. The search strategy was developed and iteratively refined by the review team. The following Boolean search string was adapted for each database, using the specified study period filters (2010-2025) where available: ("Prostate cancer" OR "Prostate adenocarcinoma" OR "Prostatic adenocarcinoma") AND ("Togo" OR "Sierra Leone" OR "Senegal" OR "Benin" OR "Burkina Faso" OR "Cape Verde" OR "The Guinea" OR "Ghana" OR "Guinea-Bissau" OR "Gambia" OR "Ivory Coast" OR "Mauritania" OR "Liberia" OR "Mali" OR "Nigeria" OR "Niger" OR "Cameroon" OR "Central African Republic" OR "Chad" OR "Congo-Brazzaville" OR "Gabon" OR "Sao Tome" OR "Equatorial Guinea" OR "Angola" OR "Democratic Republic of Congo").

2.6 Study selection & screening process

All retrieved citations were exported to the systematic review management software, Rayyan, which facilitated the deduplication and screening process. Two independent review authors (CMP and HW) screened the titles and abstracts of the articles against the predefined eligibility criteria. Disagreements were resolved through consensus or consultation with a third author (RA). The full texts screening was done by three other members (IL, MBS, and ST); disagreements at this stage were resolved through consensus or consultation with another author (BL). The included articles were extracted by CMP and IMU after quality assessments.

2.7 Data extraction

Data extraction was conducted independently by two reviewers (CMP and IMU) using a standardized, piloted data extraction form in a dedicated spreadsheet. Any discrepancies were resolved by discussion or adjudication by a third reviewer.

The following data points were extracted from each included study:

1. Study Characteristics: Author(s), year of publication, country, setting (institution of origin), study design (type of study), and sample size.
2. Patient Demographics and Clinical Features: Mean/median age at diagnosis, presenting symptoms, Digital Rectal Examination (DRE) findings, PSA level (mean/median, range, and distribution), tumor location, and clinical T-stage distribution.
3. Pathological Characteristics: Gleason Grading System (Gleason Grade, Gleason Score and/or Gleason Grade Group, according to ISUP 2014), presence of perineural and lymphovascular invasion, and pathological stage (pT/pN/pM).
4. Treatment outcome: Details on treatment modalities (i.e. observation, radical treatment, systemic therapy), follow-up duration, and reported outcomes (i.e. overall survival, cancer-specific survival, biochemical recurrence rates).

2.8 Risk of bias assessment

The methodological quality and internal validity (risk of bias) of each included study were assessed independently by two reviewers (MPC and IMU). The Joanna Briggs Institute (JBI) Critical Appraisal Checklist was used [10].

The methodological quality of the seven included cohort studies was independently appraised using the JBI Critical Appraisal Tool for Cohort Studies. This tool assesses potential biases across 12 specific domains, including study comparability, exposure measurement, outcome assessment, duration of follow-up, and, critically, the control of confounding factors. Studies were categorized based on their overall score (percentage of criteria met) as having a Low Risk of Bias (≥ 60%), Moderate Risk of Bias (40%-60%), or High Risk of Bias (< 40%).

The methodological quality of the sixteen included case series was systematically appraised using an 8-item checklist derived from the JBI Critical Appraisal Tool for Case Series. This tool evaluates the internal validity and reliability of the descriptive studies by assessing criteria such as clarity of inclusion criteria, description of participants, reliable measurement of condition and exposure, and completeness of follow-up. Based on the percentage of criteria met, studies were categorized for their Risk of Bias (RoB): Low Risk (≥ 60%), Moderate Risk (40%-60%), or High Risk (< 40%).

The methodological quality of the two included quasi-experimental studies was assessed using a 10-item checklist derived from the JBI Critical Appraisal Tool for Quasi-Experimental Studies (non-randomized studies with an intervention). This tool evaluates the internal

validity by focusing on key domains such as intervention description, participant similarity at baseline, control of confounding, reliability and objectivity of outcome measurement, and completeness of follow-up. Based on the percentage of criteria met, studies were categorized for their RoB: Low Risk (≥ 60%), Moderate Risk (40%-60%), or High Risk (< 40%).

3 Result

3.1 Study selection

Our article search on the three selected databases (pubmed, scopus, and web of science) returned a total of 1844 articles. After systematic removal of duplicates (625 articles), 1219 articles we retained for title and abstract screening. At the end of the title and abstract screening, 1172 articles were excluded. The remaining 47 articles were sorted for retrieval and subsequent full test screening. We were not able to retrieve 7 articles despite all efforts we made; hence, only 40 articles were retrieved for full text screening. Following full-text screening, 25 articles were deemed eligible for final inclusion in the review (Fig 1).

3.2 Quality assessment

The results from the JBI Critical Appraisal Tool for Cohort Studies, detailed in Table 1, indicate that none of the studies achieved a low RoB, with the evidence base being primarily composed of studies carrying a moderate or high risk, particularly due to weaknesses in reporting and managing confounding and participant attrition (Table 1).

The comprehensive results from the JBI Critical Appraisal Tool for Case Series, presented in Table 2, demonstrate a consistently high level of methodological quality across this category of evidence (Table 2).

The results from the JBI Critical Appraisal Tool for Quasi-Experimental Studies (non-randomized studies with an intervention), presented in Table 3, indicate that both included studies achieved a low RoB, signifying a strong methodological contribution from this subset of the evidence (Table 3).

3.3 Study characteristics

Figures 2, 3, 4 and Table S1 comprehensively detail the characteristics of the 25 included primary studies utilized in this systematic review. They provide essential metadata, outlining the author and publication year, the country of origin within the West and Central African region, the institutional setting, including teaching hospital and clinic, the specific type of study design (16 case series, 7 cohorts, and 2 quasi-experimental studies), and the total number of prostate cancer cases analyzed per study. Crucially, the table synthesizes data on patient age, consistently highlighting that most studies report the mean, median, or modal age of prostate cancer diagnosis to be in the late sixth or seventh decade of life (typically ranging from 66 to 72 years), underscoring the advanced age at presentation across the region. The table thus establishes the geographical and methodological landscape of the evidence base. Most of retrieved articles were from Nigeria (56%), Senegal (12%), and Ghana (12%) (Figs 2, 3, 4; Table S1).

3.4 Clinicopathological features

Figures 5, 6, 7, 8, 9, 10 and Table S2 summarize the core clinicopathological features of prostate cancer reported across the included studies, reflecting the aggressive nature and often-late presentation of the disease in WCA. The data consistently highlights a high prevalence of Low Urinary Tract Symptoms (LUTSs) and symptoms suggestive of advanced disease, such as bone pain and features of metastasis, as primary presenting complaints. Regarding biomarkers, the reported mean and median PSA levels at diagnosis are markedly elevated, frequently exceeding 100 ng/mL in multiple studies, which strongly correlates with advanced disease stage. The PSA level is reported as leading screening modality. Correspondingly, studies that reported staging demonstrated a high proportion of patients presenting with locally advanced (T3/T4) and metastatic (Stage 4) disease. Pathologically, a predominant distribution towards high-grade disease is illustrated, with a significant majority of reported cases categorized as Gleason Score (GS) ≥ 7 (or ≥ 8) and Gleason Grade Group (GGG) 4 and 5, confirming the worsening phenotype of prostate cancer in this cohort (Figures 5, 6, 7, 8, 9, 10; Table S2).

3.5 Treatment and outcomes

Figure 11 and Table S3 present a detailed overview of the treatment modalities and reported outcomes for prostate cancer patients within the reviewed studies. The treatment landscape is dominated by systemic and palliative approaches, with ADT, including Bilateral (Total) Orchidectomy (BTO/BSO) and Luteinizing Hormone-Releasing Hormone (LHRH) analogues, being the primary intervention for the vast majority of patients. Radical/curative treatments, such as Radical Prostatectomy (RP) and External Beam Radiation Therapy (EBRT), were utilized in a very small fraction of cases, reflecting the advanced stage at diagnosis. Outcomes, where reported, indicate suboptimal survival; for instance, one study reported that approximately one-third of patients died within two years of diagnosis and treatment. The table also includes data on patient adherence and follow-up, noting high rates of patients defaulting on treatment or being lost to follow-up, alongside the development of CRPC, highlighting significant challenges in long-term

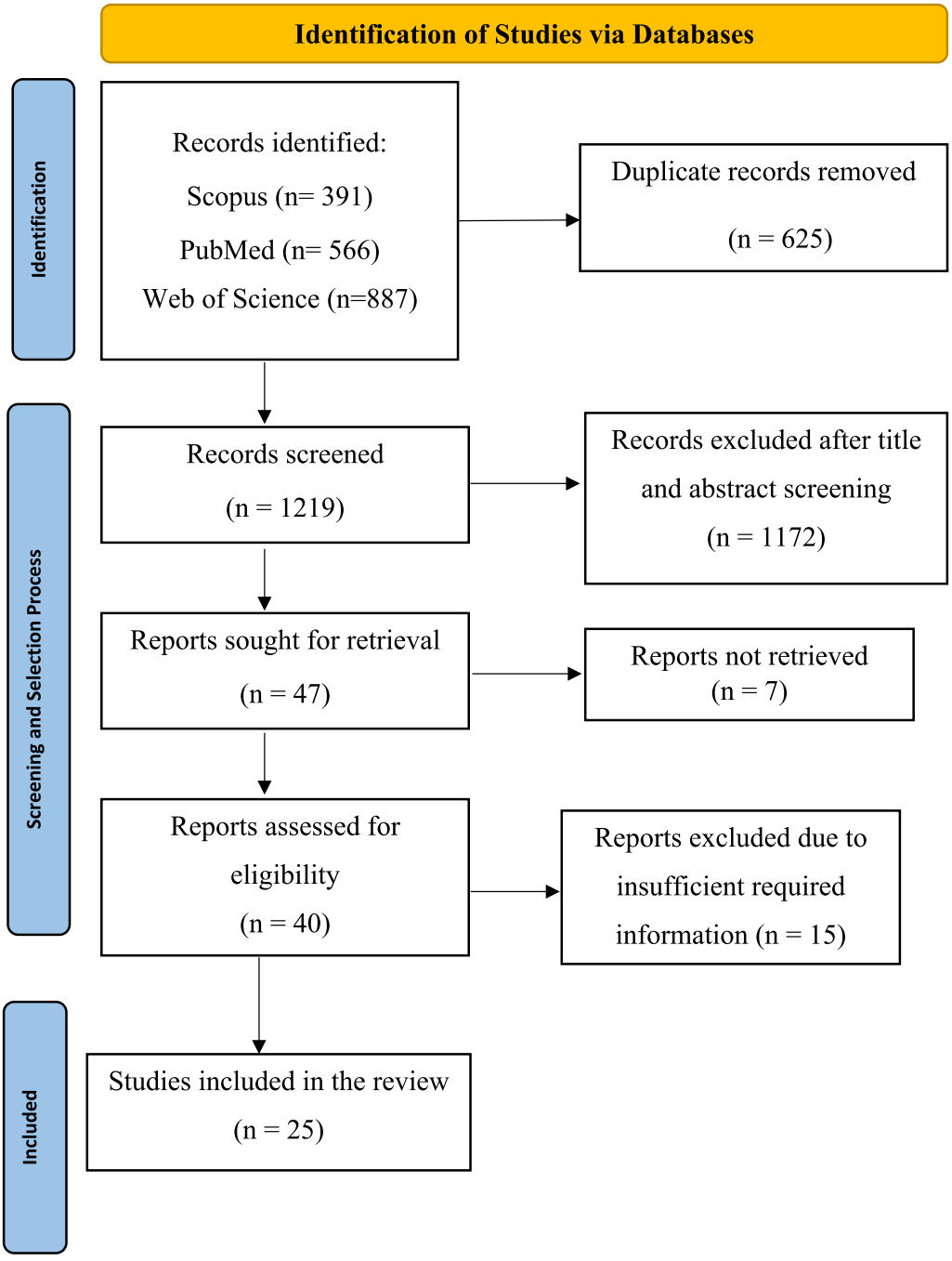


Fig. 1 PRISMA flow chart of study selection

management and data completeness across the region (Fig 11; Table S3).

4 Discussion

4.1 Quality assessment

The quality assessment demonstrated remarkable methodological strength within the case series (Table 2) and quasi-experimental studies (Table 3). All 16 case series and both quasi-experimental studies were categorized as having a Low RoB. For the case series, the consistently high scores (75.0% to 100.0%) attest to the clarity of their clinical reporting, including well-defined inclusion criteria (Q1), sufficient description of demographic information (Q2), and reliable measurement of clinical conditions and outcomes (Q3, Q8). Despite high quality scores, minor reporting deficiencies were noted in the follow-up domain (Q6 and Q7), with several studies having "Unclear" or "No" for follow-up measures. Nevertheless,

Table 1 Quality assessment checklist for included cohort studies

Study	Q1*	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Overall score	Risk bias**
Yeboah et al. [28]	N/A	N/A	Yes	Yes	U	Yes	Yes	Yes	U	N/A	N/A	U	41.6%	Moderate
John et al. [27]	N/A	N/A	Yes	Yes	Yes	Yes	Yes	N/A	No	U	Yes	Yes	58.3%	Moderate
Kabore et al. [40]	N/A	N/A	Yes	Yes	Yes	No	Yes	U	U	N/A	N/A	No	33.3%	Moderate
Lamine et al. [17]	N/A	N/A	Yes	N/A	Yes	No	Yes	U	U	N/A	N/A	No	25.0%	High
Mbey et al. [55]	N/A	N/A	Yes	U	U	Yes	Yes	Yes	Yes	N/A	N/A	Yes	50.0%	Moderate
Mensah et al. [30]	N/A	N/A	Yes	Yes	Yes	U	Yes	N/A	Yes	U	N/A	Yes	50.0%	Moderate
Ikuerowo et al. [18]	N/A	N/A	Yes	N/A	U	U	Yes	N/A	U	N/A	N/A	Yes	25.0%	High

*Q1-Q12 indicate questions 1 to 12 based on JBI Risk Appraisal for cohort studies. Q1 - Were the two groups comparable? Q2 - Were the participants included in any comparisons similar? Q3 - Were the exposure (s) reliably measured? Q4 - Was the cohort allocated to the exposure group based on the results of valid measurement? Q5 - Were the confounding factors identified? Q6 - Were strategies to deal with confounding factors used in the analysis? Q7 - Were the outcomes measured in reliable way? Q8 - Was the follow-up period long enough? Q9 - Was the follow-up complete, and if not, were the reasons to lose participants to follow-up described? Q10 - Were the participants who were lost to follow-up different from those who remained? Q11 - Were outcomes measured in a similar way for all groups? Q12 - Was the data analysis conducted with appropriate statistical adjustment? N/A: Not applicable, U: Unclear. **Risk bias: High Risk (score < 40%), Moderate Risk (score of 40%-60%), and Low Risk (score ≥ 60%)

the low RoB indicates that these studies provide a high degree of confidence in the accurate description of clinical characteristics and outcomes, establishing a reliable descriptive foundation for the synthesis [11]. Similarly, the two quasi-experimental studies, particularly Fall et al. [35] achieving a 90.0% score, demonstrated robust internal validity, fulfilling almost all JBI criteria. This suggests a strong methodological contribution from interventional studies, which are pivotal for evaluating efficacy, even in the absence of full randomization [10, 11].

In stark contrast to the descriptive studies, the cohort studies (Table 1) collectively represent the primary methodological limitation of the evidence base. None of the seven included cohort studies achieved a Low RoB. Five studies were classified as Moderate RoB, and two [17, 18] were classified as High RoB. This overall profile of uncertainty limits the confidence that can be placed in any pooled effect estimate derived from these observational, analytic studies [12].

The critical weaknesses stem from recurrent deficiencies in two key domains essential for establishing robust causality in non-randomized designs: control of confounding and management of attrition [13]. A substantial number of cohort studies either failed to clearly identify confounding factors (Q5: 4 studies were "Unclear") or, more critically, failed to employ appropriate statistical strategies to adjust for them in the analysis (Q6 and Q12: 5 and 5 studies were "No" or "Unclear", respectively). Uncontrolled confounding factors can severely distort the observed association between exposure and outcome, leading to biased estimates of effect [14]. The lack of rigorous adjustment necessitates that any quantitative findings from these cohorts be interpreted with significant caution. Reporting on participant follow-up was frequently inadequate. Five studies had "Unclear" documentation regarding the completeness of follow-up (Q9), raising concerns about attrition bias. When participants lost to follow-up differ systematically from those who complete the study, the final sample may not accurately represent the source population, undermining the generalizability and internal validity of the findings [12, 15].

The methodological disparity between study designs has critical implications for the synthesis. While the low RoB case series provide strong, reliable descriptive data, they cannot establish causality. Conversely, the moderate to high RoB cohort studies-the analytic source of potential causal inference-introduce significant uncertainty due to probable bias. To mitigate this risk in quantitative synthesis, sensitivity analyses are warranted, such as excluding the two High RoB cohort studies [17, 18] to assess the stability of any pooled effect [16–18]. The identified systematic reporting failures-especially concerning confounding and statistical adjustment in cohort studies-must be addressed in future research. Authors of

Table 2 Quality assessment checklist for included case series

Study	Q1*	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Overall score	Risk bias**
Chike et al. [52]	Yes	Yes	Yes	Yes	Yes	Yes	U	Yes	87.5%	Low
Ekeke et al. [42]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100.0%	Low
Akhaine et al. [46]	Yes	Yes	Yes	Yes	Yes	U	N/A	Yes	75.0%	Low
Bamnan et al. [51]	Yes	Yes	Yes	Yes	Yes	U	N/A	Yes	75.0%	Low
Kirakoya et al. [49]	Yes	Yes	Yes	Yes	Yes	Yes	U	Yes	87.5%	Low
Ayodeji et al. [34]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100.0%	Low
Ndoye et al. [44]	Yes	Yes	Yes	Yes	U	U	N/A	Yes	62.5%	Low
Ano-Edward et al. [24]	Yes	Yes	Yes	Yes	Yes	No	N/A	Yes	75.0%	Low
Folasire et al. [50]	Yes	Yes	Yes	Yes	Yes	U	N/A	Yes	75.0%	Low
Alabi et al. [43]	Yes	Yes	Yes	Yes	Yes	No	N/A	Yes	75.0%	Low
Troh et al. [23]	Yes	Yes	Yes	Yes	U	No	N/A	Yes	62.5%	Low
Fredrick et al. [25]	Yes	Yes	Yes	Yes	U	No	N/A	Yes	62.5%	Low
Tchin et al. [29]	Yes	Yes	Yes	Yes	Yes	No	N/A	Yes	75.0%	Low
Badmus et al. [41]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100.0%	Low
Joel et al. [45]	Yes	Yes	Yes	Yes	Yes	No	N/A	Yes	75.0%	Low
Obiorah et al. [22]	Yes	Yes	Yes	Yes	Yes	No	N/A	Yes	75.0%	Low

*Q1-Q8 indicate questions 1 to 8 based on JBI Risk Appraisal for case series. Q1: Were there clear criteria for inclusion in the case series? Q2: Was the demographic information of the participants sufficiently described? Q3: Was the condition measured in a reliable way? Q4: Were the clinical findings of the case series sufficiently described? Q5: Was the exposure measured in a reliable way? Q6: Was there follow up of the participants? Q7: Was the follow up period sufficient for the outcome? Q8: Were the outcomes measured in a reliable way? N/A: Not applicable, U: Unclear. **Risk bias: High Risk (score < 40%), Moderate Risk (score of 40%-60%), and Low Risk (score ≥ 60%)

observational studies should adhere strictly to reporting guidelines, such as the STROBE statement, to enhance transparency and allow for robust quality appraisal [19]. The strong performance of the quasi-experimental studies (Table 3) suggests that interventional designs, even non-randomized ones, are a feasible and methodologically superior path forward for evaluating interventions in this domain.

4.2 Study characteristics

The synthesis incorporated a diverse body of 25 primary studies, providing a comprehensive overview of prostate cancer presentation and management within the West and Central African region. A structured analysis of study characteristics (Figs 3,4; Table S1) and geographical distribution (Fig 2) established the overall landscape of the available evidence [2].

The evidence is highly concentrated geographically, with Nigeria contributing 56% of the included articles. This geographical skew is not merely a reflection of population size but highlights a "Francophone data gap" in global oncology indexing. While this review included French-language search criteria, the disparity persists due to two primary factors: indexing disparities and structural research barriers. Many African medical journals, particularly those from Francophone Central Africa, are not consistently indexed in major Anglophone databases like PubMed or Scopus. Research published in local journals such as Médecine d'Afrique Noire or through the African Index Medicus (AIM) is often "lost" to international systematic reviews unless specialized regional databases are exhaustively queried. Countries in Central Africa, such as the Democratic Republic of Congo or Chad, often face greater infrastructure deficits and lower research funding compared to better-established tertiary systems in Anglophone West Africa (e.g., Nigeria and Ghana). This results in a genuine lack of primary research output in addition to the indexing bias. Consequently, the findings may not fully capture the clinical landscape of the 25 nations in the region, particularly the unique health-system challenges faced in non-English speaking Central African states [2, 20].

Institutionally, the majority of studies were conducted in Teaching Hospitals or tertiary referral centers. This focus (e.g., University of Port Harcourt Teaching Hospital, Korle Bu Teaching Hospital) suggests that the patient cohorts analyzed likely represent more advanced or complex cases referred from lower-level facilities. This potential selection bias inherent in hospital-based, tertiary-referral data may lead to an overestimation of disease severity and advanced-stage presentation compared to population-based incidence studies [11, 21]. Furthermore, the diagnostic infrastructure at these centers often dictates the precision of staging; while Multiparametric MRI (mpMRI) is the global standard for localized staging, its limited availability, high maintenance costs, and the lack of specialized radiologic expertise in many regional facilities represent significant structural barriers to modern diagnostic pathways.

The synthesis encompassed three main study designs: 16 Case Series, 7 Cohort Studies, and 2 Quasi-Experimental Studies. This distribution confirms that the bulk of the current evidence is descriptive (case series), focusing on documenting clinical experience and patient

Table 3 Quality assessment checklist for included Quasi-experimental study

Study	Q1*	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Overall score	Risk bias**
Osunaiye et al. [26]	Yes	N/A	Yes	Yes	No	Yes	Yes	U	N/A	Yes	60.0%	Low
Fall et al. [35]	Yes	Yes	Yes	Yes	U	Yes	Yes	Yes	Yes	Yes	90.0%	Low

*Q1-Q10 indicate questions 1 to 10 based on JBI Risk Appraisal for quasi-experimental studies . Q1 - Was there a clear description of the intervention/treatment? Q2 - Were the participants included in any comparison groups similar? Q3 - Were the participants similar to each other at baseline? Q4 - Was the intervention administered in a similar manner to all participants? Q5 - Were the effects of confounding factors adjusted for in the statistical analysis? Q6 - Were the outcomes measured in a reliable way? Q7 - Was the measurement of outcomes objective? Q8 - Was the follow up complete? Q9 - Were the participants who were lost to follow-up described and accounted for? Q10 - Were outcomes analyzed using appropriate statistical methods? N/A: Not applicable. U: Unclear. **Risk bias: High Risk (score < 40%), Moderate Risk (score of 40%-60%), and Low Risk (score ≥ 60%)

profiles, rather than rigorously investigating incidence, prognosis (cohorts), or intervention efficacy (quasi-experimental) [11, 22–28]. While the high number of case series provides rich descriptive data, the reliance on these retrospective designs, which often lack comprehensive follow-up and rigorous control for confounders, contributes to the methodological fragility identified in the quality assessment [10, 12].

The total number of prostate cancer cases analyzed varied widely, from 29 cases [29] to a substantial 2,564 cases [30]. The large aggregated sample size across the 25 studies provides a robust base for descriptive epidemiology, but the heterogeneity in patient volumes and the mixture of retrospective and prospective designs must be considered when pooling outcomes [12, 29, 30].

A crucial and consistent finding across Table S1 is the advanced age at which prostate cancer is diagnosed across the region. The mean, median, or modal age of diagnosis universally falls within the late sixth or seventh decade of life, typically ranging from ~ 66 to 72 years (e.g., Ayodeji et al. [34] mean age: 70.4 years; Fall et al. [35] mean age: 72.17 years). This late presentation is a critical clinical indicator and is frequently cited in the literature as a defining challenge of prostate cancer care in Sub-Saharan Africa (SSA) [31–35].

The advanced age at diagnosis is generally attributed to a combination of factors: (a) lack of organized, widespread PSA screening programs, leading to symptom-driven diagnosis; (b) low public awareness and cultural barriers to seeking care; and (c) challenges with access to definitive diagnostic facilities [31, 36]. Consequently, men are diagnosed when the disease has progressed to a clinically symptomatic and often locally advanced or metastatic stage, which is supported by global reports of a larger proportion of stage T3/T4 tumors in African populations [6]. The data thus strongly suggest that efforts focusing on early detection and awareness campaigns targeting men in their late fifth and sixth decades are urgently required to shift the age and stage profile of diagnosis [36].

4.3 Clinicopathological features

The integrated analysis of clinicopathological features (Figs 5, 6 , 7, 8, 9, 10; Table S2) across the included studies provides compelling evidence of the phenotypic worsening and significantly late clinical presentation of prostate cancer in WCA. The convergence of highly elevated PSA levels, advanced clinical staging, and high-grade pathology paints a consistent picture of a disease burden that is often diagnosed beyond the window for curative-intent localized therapy [37].

The initial symptoms reported by patients are overwhelmingly related to advanced disease. Studies consistently document a high prevalence of LUTSs, often

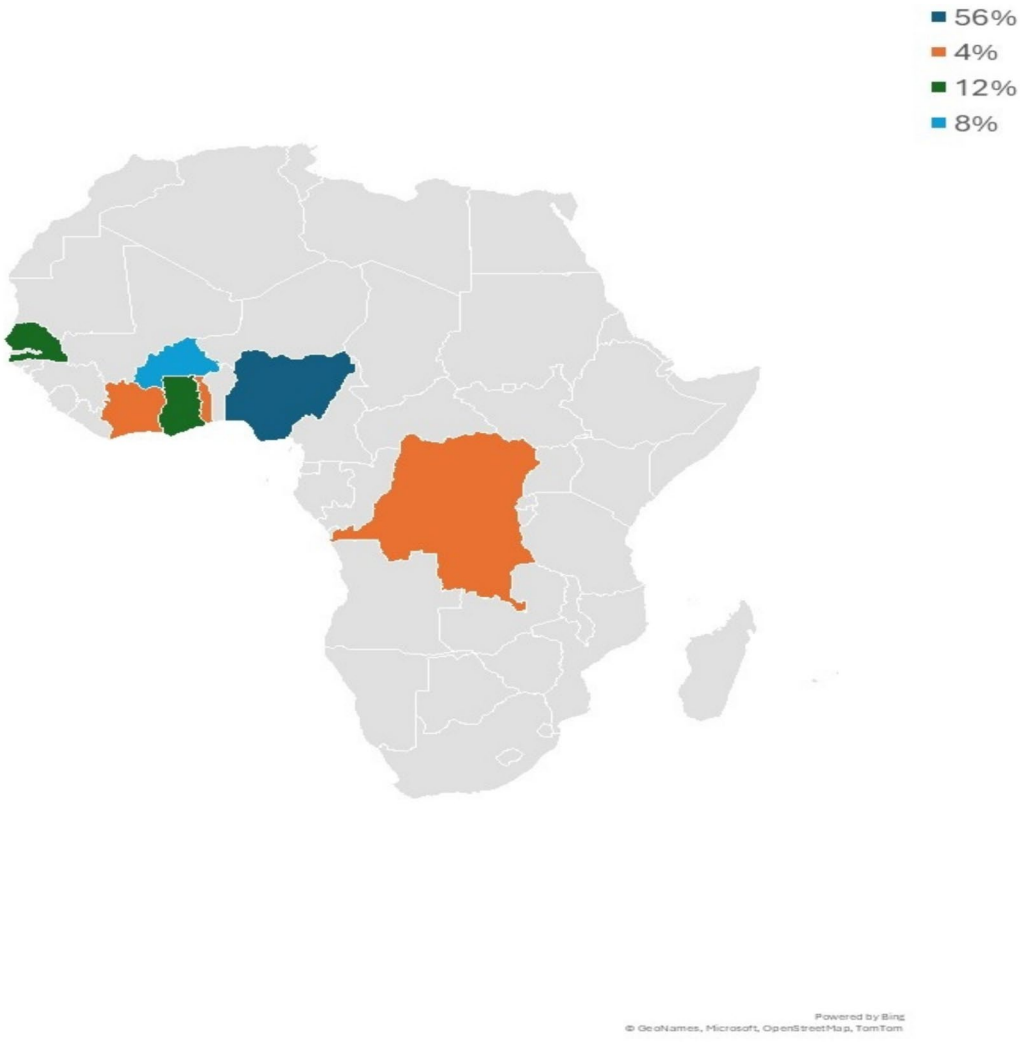


Fig. 2 Choropleth Map showing the distribution of the country of study

presenting acutely as urinary retention (e.g., [40]: 55.7%; [29]: 20.69%). Crucially, symptoms suggestive of metastasis, such as bone pain (e.g., [41]: 50.3%; [43]: 35.4%) and neurological deficits (paraparesis/paraplegia, e.g., [42]: 8.8%), are frequent primary complaints. This symptom constellation is a hallmark of late-stage diagnosis and is significantly different from the presentation patterns seen in populations with widespread screening, where asymptomatic or localized disease is more common [29, 38–45].

DRE findings, where reported (e.g., [46]: 62.2%; [41]: 92.1%), demonstrated a high incidence of suspicious or frankly abnormal prostates at the time of diagnosis, corroborating the locally advanced nature of the disease [38, 41, 46]. The most prevalent screening modality is the PSA level testing. The most striking biomarker finding is the markedly elevated PSA levels at the time of diagnosis. Multiple studies reported mean or median PSA values that frequently exceeded 100 ng/mL (e.g., [40]: Mean PSA 537 ng/mL; [49]: Mean PSA 746 ng/mL; [35]: Median PSA 101 ng/mL). Tchin et al. [29] reported a median PSA of 188 ng/mL. These figures far surpass the typical PSA values associated with localized disease and are indicative of significant tumor volume and probable metastasis [29, 35, 40, 47–49]. While PSA levels are known to be higher in populations of African descent, the extreme elevation reported here is primarily driven by the late presentation stage [32, 47, 48]. The role of imaging in confirming these advanced stages remains a challenge. In most of the included studies, staging relied heavily on DRE and transrectal ultrasound rather than MRI. The absence of routine MRI access likely contributes to under-staging in some instances or, conversely, a reliance on clinical signs of advanced disease (like bone pain or cachexia) to confirm metastasis, further emphasizing the gap between regional practice and international gold-standard staging guidelines.

The biomarker data strongly correlates with the clinical staging and pathological findings. Studies that reported

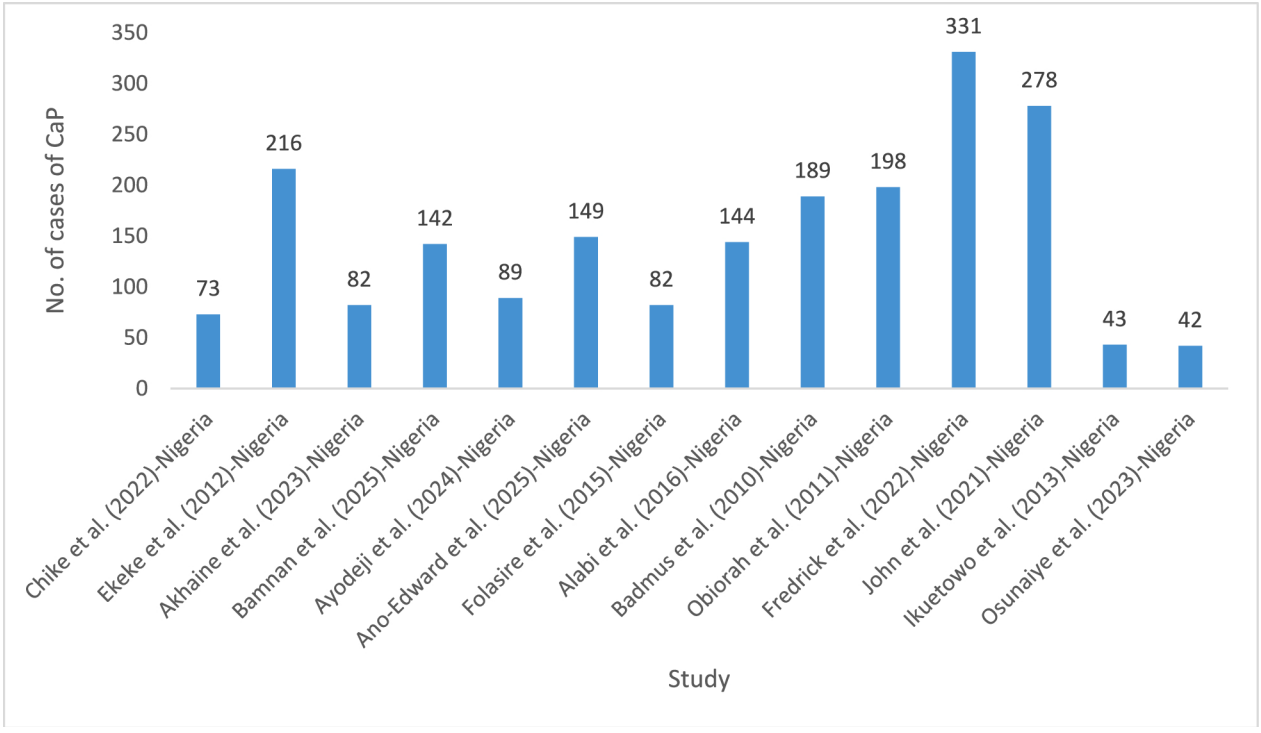


Fig. 3 Number of cases of prostate cancer in included studies from Nigeria. CaP: Cancer of the Prostate

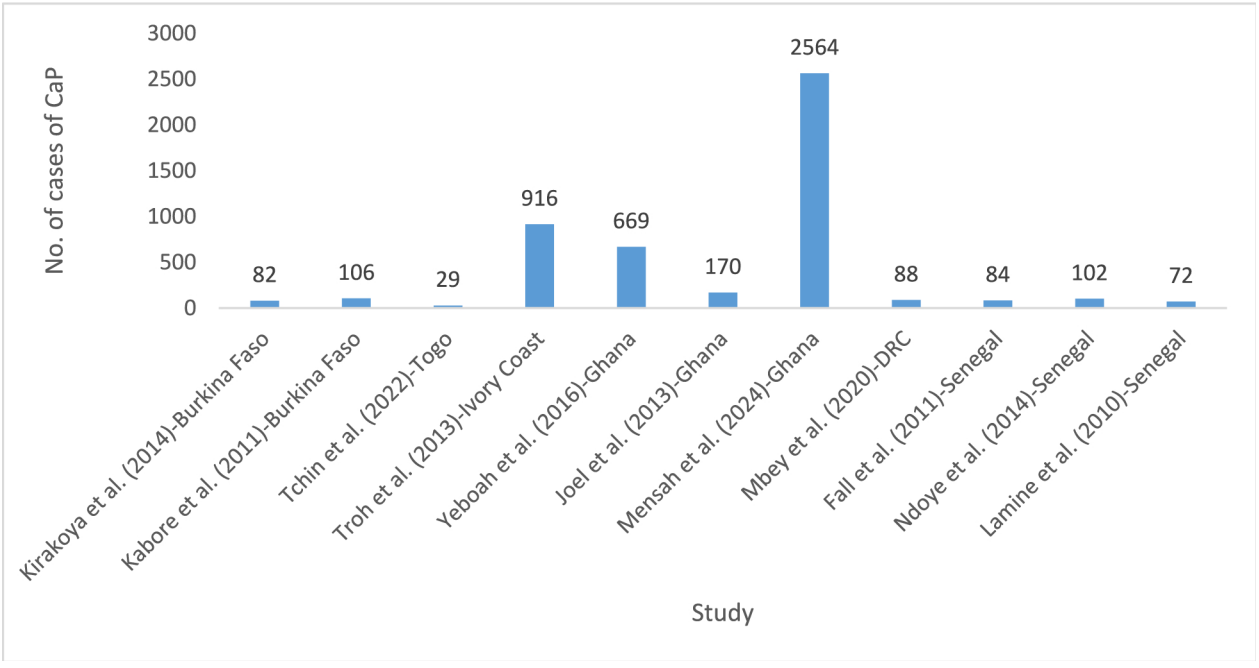


Fig. 4 Number of cases of prostate cancer in included studies from other countries. CaP: Cancer of the Prostate

staging (e.g., [30, 40, 52]) confirmed a high burden of advanced disease. Kabore et al. [40] reported T3-T4 stages in 73.6% of patients, and Mensah et al. [30] noted a very high prevalence of T3 (87.6%) and T4 (95.7%) in their respective patient groups. Chike et al. [52] reported Stage 4 disease in 68.5% of cases, and Kirakoya et al. [49] noted metastasis in 40.2% of patients.

Pathologically, the evidence points to a predominantly high-grade disease profile at the time of clinical capture. A significant majority of reported cases fell into high-grade categories, with studies such as Bamnan et al.

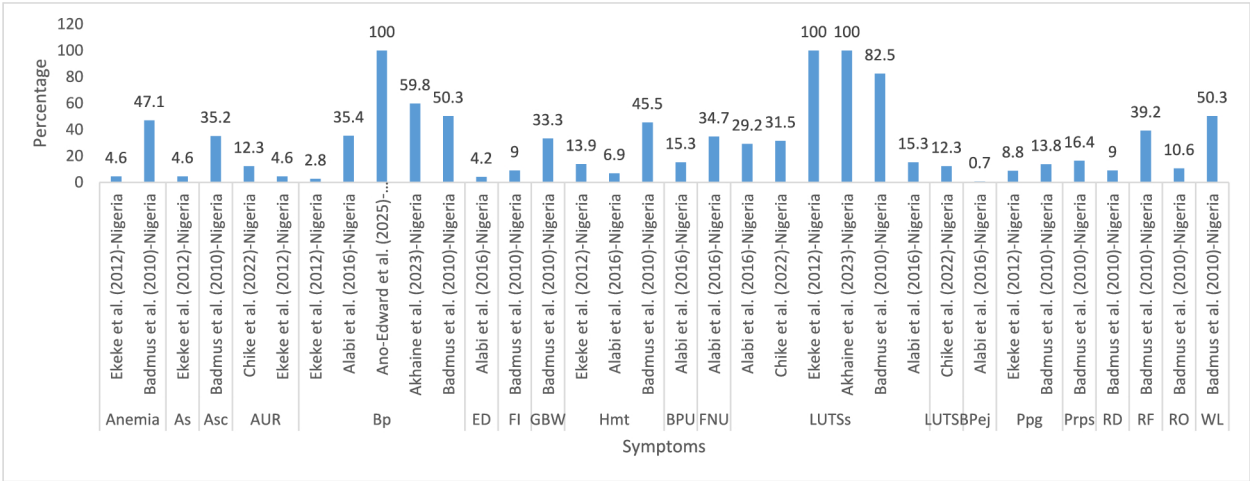


Fig. 5 Symptoms presented in included studies from Nigeria. As: Asymptomatic. Asc: Ascites. AUR: Acute Urinary Retention. Bp: Bone pain. ED: Erectile Dysfunction. FI: Fecal Incontinence. GBW: Generalized Body Weakness. Hmt: Hematuria. BPU: Burning Painful Urine. FNU: Frequent Night Urine. LUTSs: Lower Urinary Tract Symptoms. LUTSB: Lower Urinary Tract Symptoms + Bone pain. Pej: Painful ejaculation. Ppg: Paraplagia. Prps: Paraparesis. RD: Respiratory Distress. RF: Renal Failure. RO: Rectal Obstruction. WL: Weight Loss

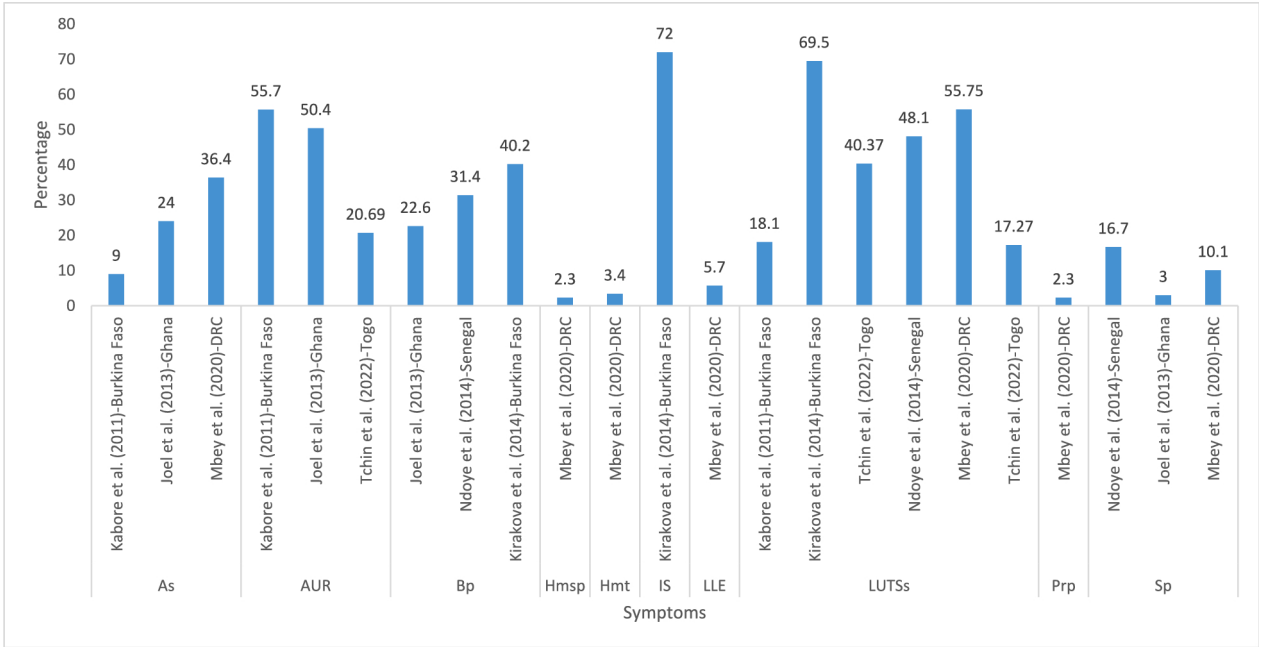


Fig. 6 Symptoms presented in included studies from other countries. As: Asymptomatic. AUR: Acute Urinary Retention. Bp: Bone pain. Hmsp: Hemospermia. Hmt: Hematuria. IS: Irritative Symptoms. LLE: Lower Limbs Edema. LUTSs: Lower Urinary Tract Symptoms. Prps: Paraparesis. Sp: Spinal pain

[51] and Alabi et al. [43] reporting GS ≥ 8 in over 70% of cases [43, 50, 51]. However, it is essential to distinguish between inherent biological aggression and the "phenotypic worsening" associated with late-stage diagnosis.

While ancestral disparities in genomics may play a role, the extreme elevations in PSA and the prevalence of high GSs are inextricably linked to the advanced clinical stages (T3/T4) observed. In the absence of early screening, tumors in WCA are diagnosed only after significant clonal evolution and progression have occurred. Consequently, the "aggressive profile" identified in this synthesis may, in part, be an artifact of this diagnostic delay-whereby tumors have had years to undergo grade migration and dedifferentiation before being biopsied [32, 33, 43, 51]. Future research using age- and stage-matched cohorts from different global regions is necessary to isolate truly "unique" biological drivers from the consequences of late presentation.

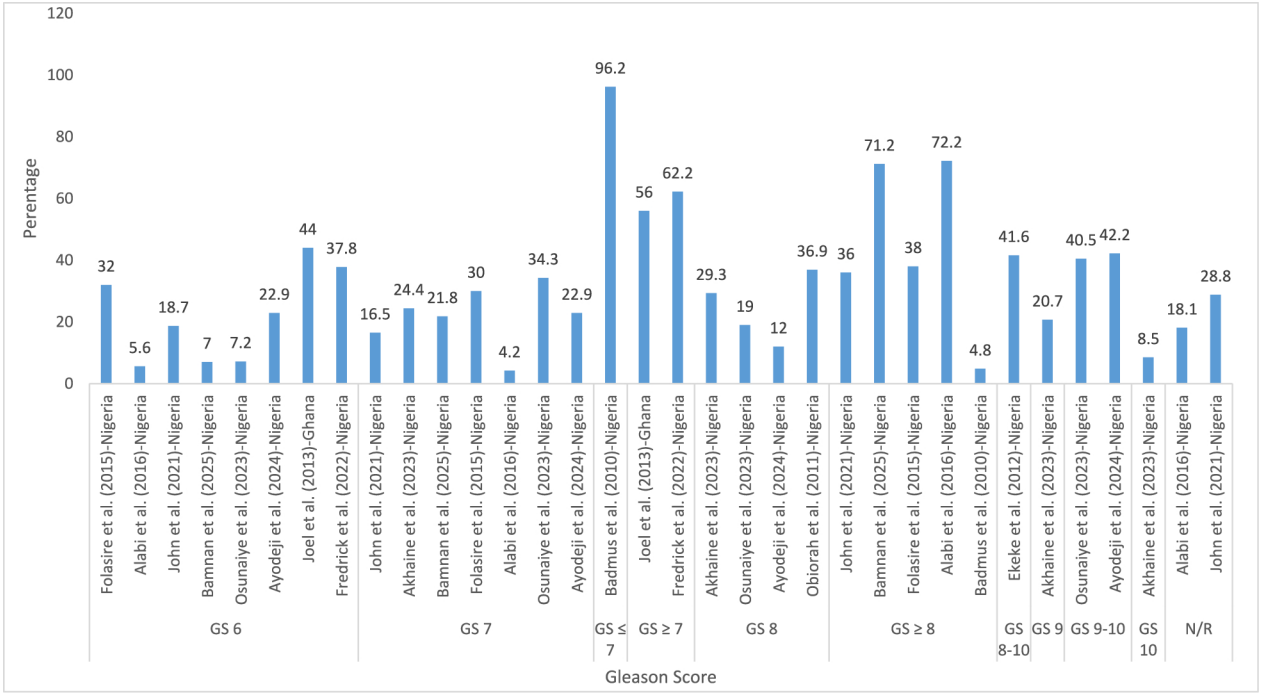


Fig. 7 Gleason Score presented in included studies from Nigeria.GS: Gleason Score. N/R: Not Recorded

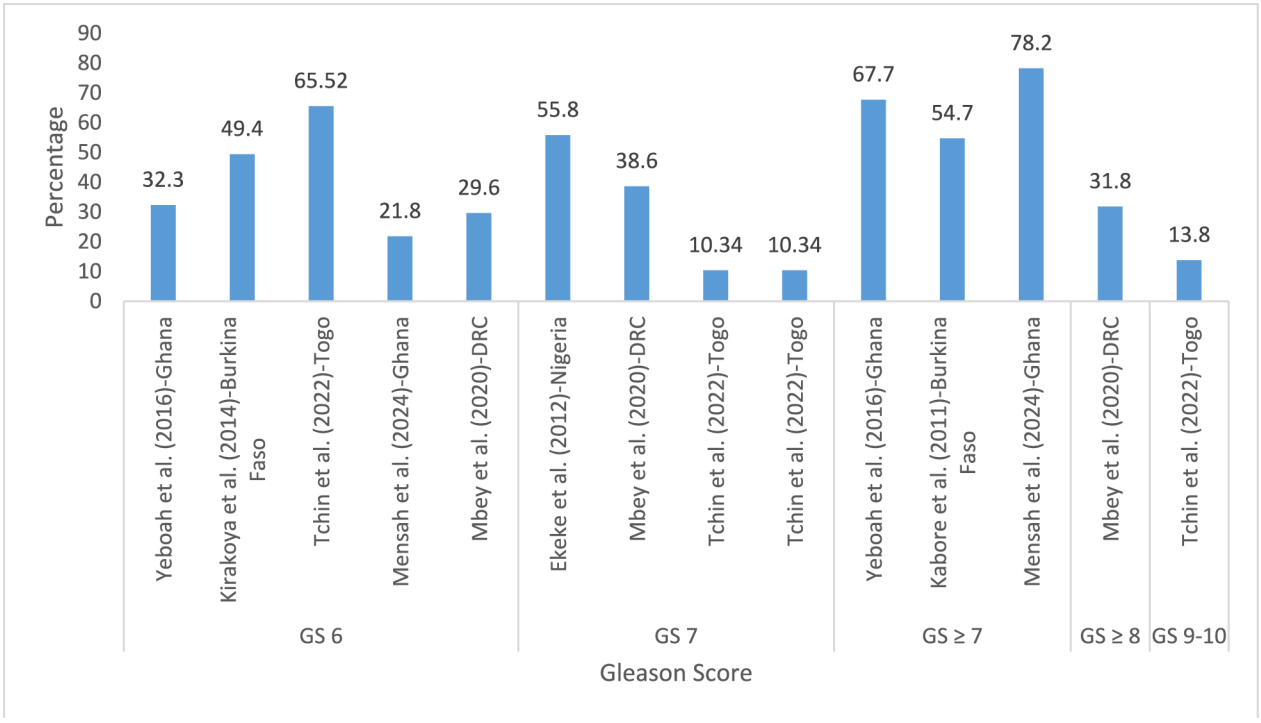


Fig. 8 Gleason Score presented in included studies from Nigeria. GS: Gleason Score. N/R: Not Recorded

4.4 Treatment/management and treatment outcome

The analysis of treatment modalities and outcomes (Fig 11; Table S3) confirms that the care of prostate cancer in the West and Central African region is heavily dictated by the advanced stage of presentation. The therapeutic landscape is characterized by a reliance on systemic control and palliation, highlighting the urgent need for strategies to facilitate earlier diagnosis [33].

The data consistently show that ADT remains the cornerstone of prostate cancer management, reflecting the

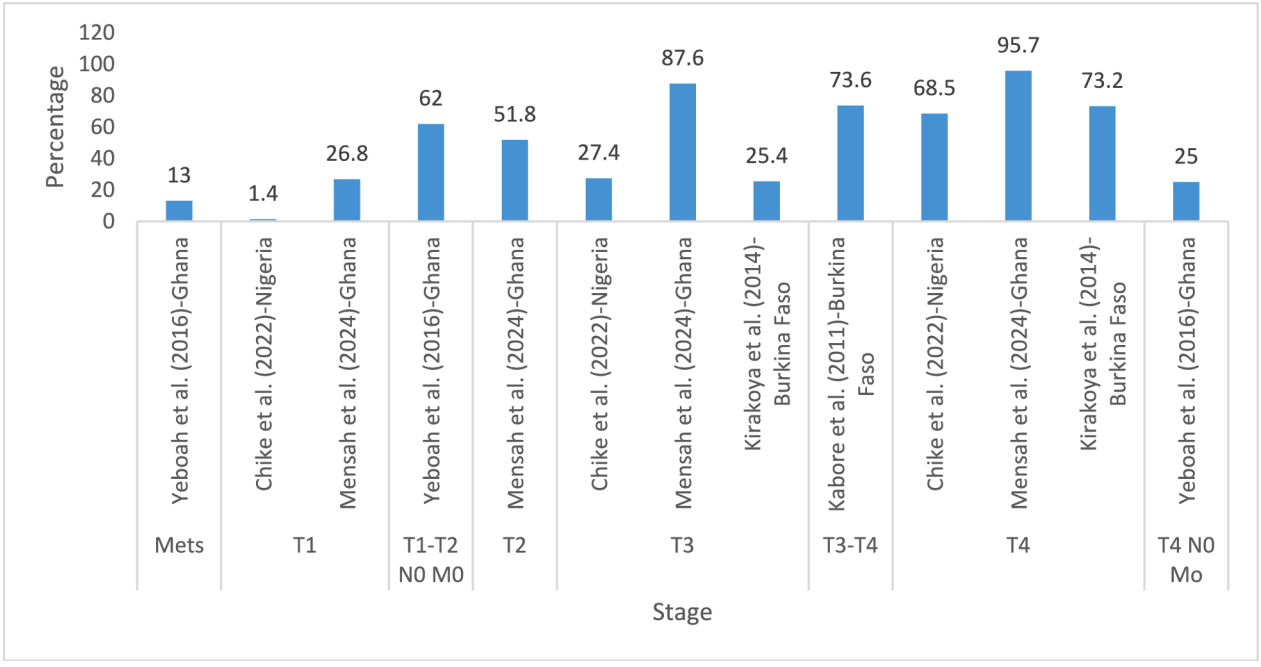


Fig. 9 Clinical stage.Mets: Metastasis

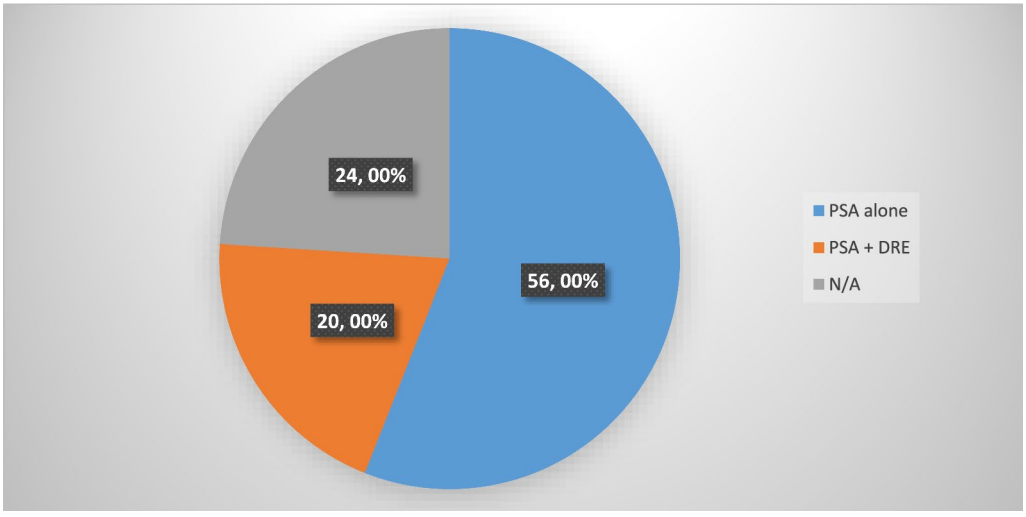


Fig. 10 Screening modality. PSA: Prostate Specific Antigen. DRE: Digital Rectal Examination. N/A: Not Available

high prevalence of locally advanced and metastatic disease (as seen in Table S3). The primary methods of ADT include BTO/BSO and medical ADT [41, 46, 52]. BTO/BSO, surgical approach offering rapid and sustained androgen ablation, is highly prevalent (e.g., [52]: 38.4%; [46]: 42.7%; [41]: ~ 79.2%). The frequent use of BTO is likely due to its cost-effectiveness and ease of administration in resource-limited settings compared to long-term medical ADT [2]. Medical ADT like LHRH analogues (e.g., Goserelin, Leuprorelin) and anti-androgens (e.g., Flutamide, Bicalutamide) are also commonly employed, either alone or as part of Maximal Androgen Blockade ([42]: 14.1% combined LHRH agonist and anti-androgen).

The high prevalence of BTO (e.g., 79.2% in [41]) underscores its role as a pragmatic gold standard in the region. Unlike medical ADT (LHRH analogues), which requires lifelong adherence to expensive injections and frequent hospital visits, BTO offers a "one-and-done" solution to androgen deprivation. Given the documented attrition rates, such as the 28.9% default rate reported by [34], orchidectomy serves as a vital safeguard against treatment non-compliance. For patients facing significant geographical and financial barriers to tertiary care, BTO

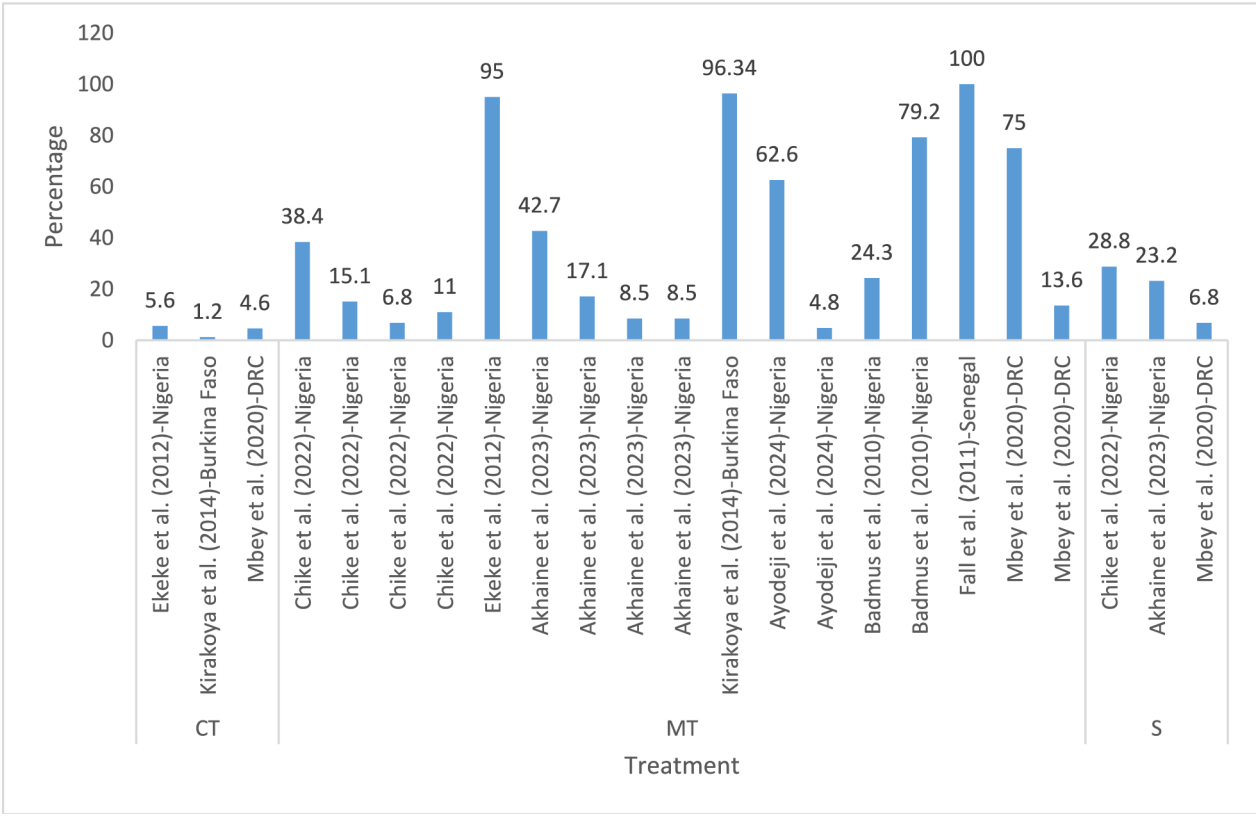


Fig. 11 Treatment modalities. CT: Curative Treatment. MT: Medical Treatment. S: Surveillance

ensures sustained testosterone suppression that is not dependent on a fragile supply chain or the patient's ability to fund recurring medication costs.

Crucially, radical/curative treatments such as RP and EBRT are scarce. For instance, Ekeke et al. [42] reported that only 5.6% of patients received curative treatment, and Kirakoya et al. [49] reported RP in just 1.2% of cases. This finding is directly attributable to the late stage at diagnosis, as these local therapies are typically reserved for localized (T1/T2) disease [42, 49, 53]. The deployment of EBRT primarily focused on palliative care for symptoms like bone pain ([42]: 4.2% palliative radiotherapy) [2].

While this review spans a 15-year period (2010-2025), a subgroup analysis of the studies reporting treatment modalities reveals a transition in management trends that aligns with global shifts in practice. Earlier data from 2010 to 2014, such as those from Badmus et al. [41] and Fall et al. [35], show a heavy reliance on surgical castration via bilateral or subcapsular orchidectomy [35, 41]. In contrast, more recent studies from 2020 to 2024, including Chike et al. [52] and [34], demonstrate an increased utilization of medical ADT and emergence of conservative management strategies like active surveillance. Although the limited number of studies reporting these details (n = 9), precludes a definitive statistical trend analysis across 5-year intervals, these findings provide a representative snapshot of the evolving therapeutic landscape in SSA.

Reported outcomes, though limited in many studies, suggest significant challenges in achieving long-term survival. Ekeke et al. [42] reported that 33.2% of patients died within two years of diagnosis and treatment, and the overall survival rate beyond five years was only 30.2%. This highlights the aggressive nature of the disease at presentation and the limitations of current palliative care [6, 32, 42, 54]. Where short-term responses were measured, ADT proved effective in symptom relief and PSA reduction. For instance, Fall et al. [35] showed marked improvement in performance status (90.4%) and a median PSA nadir of 0.76 ng/mL at 12 months following subcapsular orchidectomy (a form of surgical ADT). This immediate responsiveness confirms that androgen-sensitive disease is initially well-controlled [35, 53].

The data reveals two major systemic challenges impacting long-term management and the integrity of data reporting. Multiple studies noted high rates of patients defaulting on treatment or being lost to follow-up. For example, Ayodeji et al. [34] reported a 28.9% default rate after diagnosis, and Mbey et al. (2020) reported 15.9% Loss To Follow-Up (LTFU) [34, 55]. This high attrition rate severely undermines the ability to accurately

calculate long-term survival and recurrence rates, and is a significant source of bias [15]. The development of CRPC was reported, indicating the need for second-line therapies ([42]: 19.9% developed CRPC). The utilization of advanced agents for CRPC, such as Abiraterone, was noted but was infrequent, demonstrating the persistent gap in access to modern, specialized anti-cancer medications in many settings [20, 42, 56].

In summary, the treatment pattern is a reflection of the late-stage epidemiology, relying on established, accessible ADT methods. However, high rates of LTFU and documented poor survival demonstrate the substantial need for resources dedicated to earlier diagnosis and improved surveillance for advanced disease [6, 33].

4.5 Study limitations

The primary limitations of this systematic review stem from the inherent characteristics and fragmentation of the available evidence. The evidence base is dominated by heterogeneous study designs, including numerous case series and cohort studies with a Moderate to High RoB. These studies frequently lacked rigorous control for confounding factors and documented significant attrition, which compromises the internal validity of the synthesis. Furthermore, data on critical longitudinal outcomes-such as five-year survival, recurrence rates, and precise pathological staging-were inconsistently reported or absent. This lack of standardized outcome reporting precluded a comprehensive meta-analysis and limits the ability to establish robust, evidence-based clinical guidelines.

A profound geographical imbalance exists, with 56% of studies originating from Nigeria alone. While this reflects higher research output in certain tertiary centers, it also highlights a systemic "Francophone data gap." The heavy reliance on Anglophone data from Nigeria and Ghana may be an artifact of the dominance of English-language scholarly indexing. Despite the inclusion of French-language search criteria, the dearth of studies from Francophone Central Africa suggests that much of the region's clinical data remains "lost science." This occurs because many local-language journals are not indexed in international databases like PubMed or Scopus. Consequently, the findings of this review may not fully capture the unique healthcare landscapes or patient profiles of the non-English speaking nations in the region, thereby limiting the generalizability of the results across all 25 WCA countries.

4.6 Strength of the study

Despite these limitations, this systematic review represents a crucial and timely contribution by providing the first comprehensive, regionally focused synthesis of the clinicopathological and management landscape of prostate cancer specifically across the entire WCA region (25 countries). By adhering strictly to the PRISMA 2020 guidelines and conducting a rigorous quality assessment (JBI appraisal) across diverse study types (cohorts, case series, quasi-experimental studies), this review has successfully mapped the current, albeit fragmented, evidence base, objectively identifying the key characteristics of the disease and the critical gaps in knowledge. This effort is instrumental in establishing a much-needed baseline understanding of the prostate cancer crisis in WCA and prioritizing future research and resource allocation efforts.

4.7 Future directions and policy implications

The severe public health burden of prostate cancer in WCA and the limitations identified in the current evidence mandate a clear and coordinated research agenda for future efforts. First, collaborative, multi-center studies are needed to bridge the Francophone-Anglophone divide. Future research should prioritize the inclusion of regional databases such as African Journals Online and the AIM to capture "grey literature" and local-language studies that are currently excluded from major Western repositories. Additionally, establishing cross-border research networks between Anglophone and Francophone institutions could help standardize data collection and elevate the visibility of research from Central Africa on the global stage.

Second, translational and biological research should be prioritized to investigate the unique biological aggression observed in this cohort. This includes exploring genetic and molecular mechanisms, such as common somatic or germline mutations, and investigating the interplay between lifestyle factors, infectious agents, and the tumor microenvironment.

Third, implementation science and health systems research are essential to address the systemic causes of late-stage presentation. Future work must focus on developing and evaluating cost-effective, culturally appropriate interventions for early detection (e.g., risk-stratified PSA screening), optimizing patient pathways, and assessing the feasibility of locally adapted treatment protocols to improve survival and quality of life across the region.

To improve clinical outcomes amidst high LTFU rates, regional clinical guidelines should consider explicitly prioritizing surgical orchidectomy over medical ADT for patients at high risk of treatment default. This is not merely a cost-saving measure but a strategic clinical intervention to ensure oncological control in populations where continuity of care is inconsistent. Future health systems research should evaluate the impact of "Early Surgical Castration" protocols on overall survival compared to medical ADT in settings with high attrition. Furthermore, policy efforts should focus on de-stigmatizing BTO through patient education, emphasizing its efficacy

and its role in preventing the rapid disease progression often seen when medical therapy is interrupted.

5 Conclusion

This systematic review confirms that prostate cancer in WCA is a high-mortality clinical entity characterized by an aggressive clinicopathological phenotype at diagnosis. However, a critical distinction must be made: the prevalence of high-grade disease (GGG 4 and 5) and extreme PSA levels are likely intensified by the late-stage presentation (T3/T4 or metastatic) prevalent in the region. While the data suggests an aggressive clinical course, it remains unclear to what extent this is driven by an underlying biological predisposition versus the natural progression of undiagnosed disease. The evidence reveals a therapeutic landscape dominated by palliative systemic treatments. To mitigate the catastrophic survival outcomes exacerbated by high treatment default rates, the synthesis strongly advocates for the prioritization of surgical orchidectomy as a cost-effective and adherence-neutral standard of care in resource-limited settings.

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12301-026-00556-8.

Additional file 1

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Author contributions
CMP and IMU conceptualized the work. CMP, RA, and HW screened the titles and abstracts. IL, MBS, ST, and BL screened the texts. CMP and IMU extracted the included articles. CMP wrote the draft. All authors read and approved the final manuscript.

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Data availability
All data generated during this study are included in this published article.

Declarations

Ethics approval and consent to participate
Not applicable.

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References

1. James PND, Tannock I, N'Dow J, Feng F, Gillessen S, Ali SA et al (2025) The lancet commission on prostate cancer: planning for the surge in cases. PMC 403:1683–722. https://doi.org/10.1016/S0140-6736(24)00651-2
2. Adeloye D, David RA, Aderemi AV (2016) An estimate of the incidence of prostate cancer in Africa : a systematic review and. PLoS One 11:1–18. https://doi.org/10.1371/journal.pone.0153496
3. Jalloh M, Cassell A, Niang L, Rebbeck T (2024) Global viewpoints: updates on prostate cancer in Sub-saharan Africa. BJUI Int. 133
4. Seraphin TP, Joko WY, Manraj SS, Chokunonga E, Somdyala NIM (2021) Prostate cancer survival in sub - Saharan Africa by age, stage at diagnosis, and human development index : a population - based registry study. Cancer Causes Control 32:1001–19. https://doi.org/10.1007/s10552-021-01453-x
5. Degua A, Mekonnen AN, Njogu PM (2022) A systematic review of the treatment outcomes among prostate cancer patients in Africa. Cancer Invest 40:722–32
6. Warner A, Chinegwundoh F (2025) Disparities in prostate cancer epidemiology: a comparative analysis of West Africa and Europe. J Glob Med 5:279
7. Dudipala H, Jani CT, Gurnani SD, Morgenstern-kaplan D (2025) Evolving global trends in prostate cancer : disparities across income levels and geographic regions (1990-2019). JCO Glob Oncol. https://doi.org/10.1200/GO-25-00249
8. Jani C, Dudipala H, Tran E, Mckay RR (2025) Evolving trends in prostate cancer: disparities across income levels and global regions. Am Soc Clin Oncol
9. Page MJ, Mckenzie JE, Bossuyt PM, Boutron I, Hoffmann C, Mulrow CD et al (2020) The PRISMA statement : an updated guideline for reporting systematic reviews systematic reviews and meta-analyses. BMJ 2021:372. https://doi.org/10.1136/bmj.n71
10. E A, C L, K P, B P, Jordan Z (2024) JBI manual for evidence synthesis. JBI
11. Mcarthur A, Stephenson M, Aromataris E (2020) Methodological quality of case series studies: an introduction to the JBI critical appraisal tool. JBI Evid Synth 18:2127–33. https://doi.org/10.11124/JBISRIR-D-19-00099
12. PT HJ, James T, Jacqueline C, Miranda C, Tianjing L, J PM, et al (2019) Cochrane handbook for systematic reviews of interventions
13. Madure M, Greenland S (1992) Tests for trend and dose response : misinterpretations and alternatives. Am J Epidemiol 135:96–104
14. Sterne JAC, White IR, Carlin JB, Spratt M, Royston P, Kenward MG et al (2009) Multiple imputation for missing data in epidemiological and clinical research : potential and pitfalls. BMJ 339:157–60. https://doi.org/10.1136/bmj.b2393
15. Nunan D, Aronson J, Bankhead C (2018) Catalogue of bias : attrition bias. BMJ Evidence-Based Med 23:21–2
16. Thabane L, Mbuagbaw L, Zhang S, Samaan Z, Marcucci M, Ye C et al (2013) A tutorial on sensitivity analyses in clinical trials : the what , why , when and how. BMC Med Res Methodol 13:1. https://doi.org/10.1186/1471-2288-13-92
17. Lamine N, Kouka CN, Jalloh M, Gueye M (2011) Screening for prostate cancer by digital rectal examination and PSA determination in Senegal. ISRN Oncol. https://doi.org/10.5402/2011/943704
18. Ikuerowo SO, Omisanjo OA, Bioku MJ, Ajala MO, Patrick V, Mordi N et al (2013) Prevalemce and characteristics of prostate cancer among participants of a community-based screening in Nigeria using serum prostate specific antigen and digital rectal examination. Pan Afr Med J 15:129. https://doi.org/10.11604/pamj.2013.15.129.2489
19. Elm E Von, Altman DG, Egger M, Pocock SJ, Gøtzsche PC, Vandenbroucke JP (2008) The strengthening the reporting of observational studies in epidemiology (STROBE) statement : guidelines for reporting observational studies. J Clin Epidemiol 61:344–9. https://doi.org/10.1016/j.jclinepi.2007.11.008
20. Akinremi TO, Adeniyi A, Olutunde A, Oduniyi A, Ogo CN (2014) Need for and relevance of prostate cancer screening in Nigeria. Ecancermedicalscience 8:457. https://doi.org/10.3332/ecancer.2014.457
21. Ngowi BN, Mremi A, Mbwambo OJ, Seventh F, Kalonge H, Nkya C et al (2024) Trend in incidence and clinicopathological characteristics of prostate cancer in Northern Tanzania : analysis from a population based cancer registry data 2015 – 2021. BMC Cancer. https://doi.org/10.1186/s12885-024-13194-6
22. Obiorah CC, Nwosu SO (2011) A histopathological study of carcinoma of the prostate in port Harcourt , Nigeria. Niger J Clin Pract 14:363–7. https://doi.org/10.4103/1119-3077.86785
23. Troh E, N'Dah KJ, Doukouré B, Kouamé B, Koffi KE, Aman NA et al (2013) Cancers de la prostate en Côte-d ' Ivoire : aspects épidémiologiques, cliniques et anatomopathologiques. J Afr Cancer 6:202–8. https://doi.org/10.1007/s12558-014-0314-5

24. Ano-edward H, Ajao IO, Uduagbamen PK, Ayoade A (2025) Gleason score as a diagnostic tool in prostate cancer assessment : findings from a Tertiary Health Care Center in Southwest , Nigeria. Niger Heal J 25:174–80
25. Fredrick UO, Nnabugwu II (2022) Prostate cancer characteristics : a descriptive analysis of clinical features at presentation in the last decade in a Black African community. Ann Afr Med 21:153–7. https://doi.org/10.4103/aam.aam
26. Osunaiye OI, Ramyil VM, Dakum NK, Akpayak IC, Shuaibu SI, Ofoha CG et al (2023) Correlation between serum prostate-specific antigen and testosterone following bilateral total orchidectomy for patients with advanced prostate cancer in Jos Nigeria. J West Afr Coll Surg 13:82–91
27. John RE, Danagogo O (2021) Pilot study on the locoregional demographics of prostate cancer in River State. Nigeria 62:340–5
28. Yeboah E, Aw H, Mante S, Je M, My K, Yarney J et al (2016) Management Of Prostate Cancer In Accra, Ghana La Gestion De Cancer De La Prostate A Accra, Au Ghana. J West African Coll Surg 6:31–65
29. Tchin D, Djiwa T, Kpatcha TM, Padja E, Koura GN (2022) Prostate cancers in men under the age of 50 : about a series in Togo , Sub-saharan Africa. BMC Cancer 22:1341. https://doi.org/10.1186/s12885-022-10425-6
30. Mensah JE, Akpakli E, Kyei M, Klufio K, Asiedu I, Asante K et al (2024) Translational oncology prostate-specific antigen, digital rectal examination, and prostate cancer detection : a study based on more than 7000 transrectal ultrasound-guided prostate biopsies in Ghana. Transl Oncol 51:102163. https://doi.org/10.1016/j.tranon.2024.102163
31. Gheybi K, Mmekwa N, Lebelo MT, Patrick SM, Campbell R, Nenzhelele M, et al (2023) Linking African ancestral substructure to prostate cancer health disparities. https://doi.org/10.21203/rs.3.rs-3161812/v1
32. Rebbeck TR, Devesa SS, Chang BL, Bunker CH, Cheng I, Cooney K et al (2013) Global patterns of prostate cancer incidence, aggressiveness, and mortality in men of African descent. Prostate Cancer 2013:1–12. https://doi.org/10.1155/2013/560857
33. Seraphin TP, Joko-Fru WY, Hämmerl L, Griesel M, Mezger NCS, Feuchtner JC et al (2021) Presentation, patterns of care, and outcomes of patients with prostate cancer in Sub- Saharan Africa: a population- based registry study. Cancer. https://doi.org/10.1002/cncr.33818
34. Ayodeji OO, Oyedeji ASA, Fadahunsi OO, Awelimabor DI, Osunaiye OI, Shadrach OIA- (2024) The trends, clinicopathological features, and treatment outcomes of patients with prostate cancer in Lokoja, Nigeria. J West Afr Coll Surg 15:44–52. https://doi.org/10.4103/jwas.jwas
35. Fall B, Tengue K, Sow Y, Sarr A, Thiam A, Mohamed S et al (2012) Place de la pulpectomie bilatérale dans la suppression androgénique pour cancer de la prostate. Progrès en Urologie. https://doi.org/10.1016/j.purol.2011.12.005
36. Colón OR, Bolajoko O, Odedina F (2021) Comparison of health access , lifestyle , prostate cancer knowledge and screening among black men residing in West Africa and the USA. Ecancermedicalscience 15:1309
37. Jemal A, Bray F, Ferlay J (2011) Global cancer statistics. CA Cancer J Clin 61:69–90. https://doi.org/10.3322/caac.20107
38. Makau-barasa LK, Manirakiza A, Carvalho AL, Rebbeck TR (2022) Prostate cancer screening, diagnostic, treatment procedures and costs in sub-Saharan Africa : a situational analysis. Cancer Control 29:1–15. https://doi.org/10.1177/10732748221084932
39. Nyiramana MP (2024) Epidemiology of prostate cancer in Africa: an in-depth review. Res Invent J Sci Exp Sci 4:24–30. https://doi.org/10.59298/RIJSES/2024/412430
40. Kabore FA, Zango B, Sanou A, Yameogo C, Kirakoya B (2011) Prostate cancer outcome in Burkina Faso. Infect Agent Cancer 6:S6. https://doi.org/10.1186/1750-9378-6-S2-S6
41. Badmus TA, Adesunkanmi ARK, Yusuf BM, Oseni GO, Eziyi AK, Bakare TIB et al (2010) Burden of prostate cancer in Southwestern Nigeria. Oncology 76:412–6. https://doi.org/10.1016/j.urology.2010.03.020
42. Ekeke O, Oe A, N E (2012) Management of prostate cancer in Port Harcourt, Nigeria : changing patterns gestion du cancer de la prostate au port. J West Afr Coll Surg 1:58–77
43. Alabi AO, Anthonia SC, Alabi AS, Amina FO, Kingsley KK (2016) Pattern of prostate cancer among a Nigerian population. Niger J Med 25:70–7
44. Ndoye M, Niang L, Gandaho KI, Jalloh M, Labou I, Gueye S (2014) Cancer avancé de la prostate au Sénégal . Aspects diagnostiques à l ' hôpital de Grand Advanced prostate cancer in Senegal . Clinical aspects at the. Prog En Urol 24:271–5. https://doi.org/10.1016/j.purol.2013.08.317
45. Joel Y, Vanderpuye V, Mensah J (2013) Clinicopathologic features and determinants of Gleason score of prostate cancer in Ghanaian men Gleason score. Urol Oncol 31:325–30. https://doi.org/10.1016/j.urolonc.2011.01.018
46. Akhaine JO, Shuaibu SI, Osunaiye OI, Ofoha CG (2023) Clinico-demographic profile and treatment of patients with prostate cancer in a North- central Nigerian teaching hospital. Ann Ibadan Postgrad Med 21:53–6
47. Partin AW, Pound CR, Clemens JQ, Epstein JI, Walsh PC (1993) Serum psa after anatomic radical prostatectomy: the johns hopkins experience after 10 years. Urol Clin North Am 20:713–25. https://doi.org/10.1016/S0094-0143(21)00924-1
48. Adhyam M, Gupta AK (2012) A review on the clinical utility of PSA in cancer prostate. Indian J Surg Oncol 3:120–9. https://doi.org/10.1007/s13193-012-0142-6
49. Kirakoya B, Pp H, Ak P, Ab M, Zango B (2014) Clinico-Pathological Features Of Prostate Cancer At The University Hospital Yalgado Ouedraogo , Caracteristiques Cliniques Et Histopathologiques Du Cancer De La Prostate Au Centre Hospitalier Universiataire Yalgado. J West African Coll Surg. 4
50. Folasire A, Ntekim A, Omikunle A (2015) Association of gleason risk groups with metastatic sites in prostate cancer. Afr J Biomed Res. 18
51. Bamnan D, Ezike KN, Emmanuel I, Mandong BM, Dauda AM, Akpa PO et al (2025) Prognostic significance of ki67 expression in prostate cancer in Nigerians: a single-center study. Cureus. https://doi.org/10.7759/cureus.80997
52. Chike JO, Wale R, Ajibola E, Okorie O, Obasi A, Odo C et al (2022) Prostate cancer and challenges in management in a semi-urban centre: a 10-year experience. J West African Coll Surg 12:44–8
53. Mottet N, Den Van Bergh RCN, Briers E, Den Van Broeck T, Cumberbatch MG, De Santis M et al (2020) Eau-Eanm-Estro-Esur-Siog guidelines on prostate cancer-2020 update part 1: screening, diagnosis, and local treatment with curative intent. Eur Assoc Urol. https://doi.org/10.1016/j.eururo.2020.09.042
54. Sekar R, Morgan TM, Wallner LP, Stensland K, Herrel LA (2025) Disparities in prostate cancer mortality and clinical trial availability across vul-nerable populations. Am Soc Clin Oncol
55. Mbey PM, Mukuku O, Arung WK, Tengu GK, Amisi NL, Kyabu K, et al (2020) Clinical , histopathological , and prognostic characteristics of patients with prostate cancer in lubumbashi , Democratic Republic of Congo. 2020
56. Sanni QA, Zubair A, Davis S, Nwokeocha E, Martin I, Akinjise-Ferdinand O et al (2024) A scoping review of the management of prostate cancer in Africa. J Glob Med 4:e215. https://doi.org/10.51496/jogm.v4.s1.215

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