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Determinants Of Prostate Cancer Awareness, Screening Practices, And Healthcare-Seeking Behavior Among Men In Community Settings: A Systematic Comparative Study Across The 47 Counties In Kenya And Selected Developed Countries

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Abstract
Background: *Prostate cancer remains a significant global public health challenge, with notable disparities in awareness, screening practices, and healthcare-seeking behavior among men qcross the different county settings. In Kenya, variations across the 47 counties reflect inequalities in socio-demographic factors, cultural beliefs, and access to healthcare services, which may influence early detection and treatment outcomes. Understanding these determinants in comparison with developed countries is essential for informing targeted interventions.*
Methods: *A systematic review was conducted using major electronic databases, including PubMed, Scopus, Web of Science, Google Scholar, Embase, CINAHL, Cochrane Library, ScienceDirect, and African Journals Online (AJOL), among others. A total of* ***4,959 articles*** *were identified and screened using predefined inclusion and exclusion criteria. After quality appraisal,78 studies met the eligibility criteria and were included in the final analysis. Data were synthesized using narrative and thematic approaches, with comparative analysis between Kenya and developed countries.*
Results: *The findings revealed a low levels of prostate cancer awareness, and screening uptake and treatment outcomes across many Kenyan counties, particularly in the rural based counties, compared to higher levels in developed countries and in urban counties. Key determinants included socio-demographic characteristics (age, education, income), cultural perceptions, and health system constraints. Barriers such as limited access to screening services, financial challenges, and low risk perception were prominent in Kenyan men. In contrast, developed countries demonstrated higher screening uptake and more proactive healthcare-seeking behavior due to stronger health systems and organized screening programs.*
Conclusion: *Determinants of prostate cancer awareness, screening practices, and healthcare-seeking behavior vary significantly across Kenya and between Kenya and developed countries. Addressing socio-cultural barriers, improving access to screening, and strengthening health systems are critical to enhancing early detection and improving prostate cancer outcomes.*

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I. Introduction

Determinants of prostate cancer awareness, screening practices, and healthcare-seeking behavior among men in community settings have emerged as critical factors influencing the global burden and outcomes of prostate cancer. The extent to which men are informed about the disease, participate in screening programs, and seek timely medical care significantly shapes early detection, treatment effectiveness, and survival rates. Globally, prostate cancer remains one of the most prevalent malignancies among men, with approximately 1.4 million new cases and over 375,000 deaths reported annually (Sung *et al.,* 2021; World Health Organization [WHO], 2020). Despite advancements in diagnostic and therapeutic approaches, disparities persist between high-income countries and low- and middle-income countries (LMICs), largely driven by differences in awareness levels, access to screening services, and patterns of healthcare utilization (Culp *et al.,* 2020; Parker et al., 2020; WHO, 2020).

In sub-Saharan Africa, the burden of prostate cancer is increasing, with evidence indicating higher mortality rates compared to developed regions, largely due to late-stage diagnosis and limited access to care (Adeloye *et al.,* 2021; Degu et al., 2022; Sung et al., 2021). These outcomes are closely associated with low levels

of awareness, inadequate screening uptake, and delayed healthcare-seeking behavior among men (Njuguna *et al.,* 2023; Waihenya et al., 2025). Policy reports from the Ministry of Health Kenya emphasize that cancer awareness and early detection remain limited, contributing to late presentation and poor outcomes (Ministry of Health Kenya, 2020, 2025). Cultural beliefs, stigma, fear of diagnosis, and misconceptions about cancer further contribute to delays in seeking care, while weak health systems and limited cancer control infrastructure exacerbate the problem (WHO, 2020; Ramashia *et al.,* 2024). As prostate cancer is often asymptomatic in its early stages, the role of awareness and proactive screening becomes even more critical in reducing disease burden (Parker *et al.,* 2020).

Kenya provides a unique context for examining these determinants due to its diverse socio-economic and geographic landscape across the 47 counties. Significant disparities exist between urban and rural areas in terms of access to healthcare services, education levels, and exposure to health information (Njuguna et al., 2023; Ministry of Health Kenya, 2025). Urban counties such as Nairobi, Mombasa, and Kisumu generally exhibit higher levels of awareness and better access to diagnostic services, whereas rural and marginalized counties face substantial barriers, including limited healthcare infrastructure, financial constraints, and low health literacy (Waihenya *et al.,* 2025; Degu *et al.,* 2022). These inequalities influence not only awareness and screening practices but also healthcare-seeking behavior, often resulting in delayed diagnosis and poorer outcomes (Adeloye *et al.,* 2021; WHO, 2020).

Awareness of prostate cancer is a key determinant of preventive health behavior. Studies have shown that men who are knowledgeable about prostate cancer risk factors, symptoms, and screening methods are more likely to participate in early detection programs (Ramashia *et al.,* 2024; Uwamahoro et al., 2024). However, in many Kenyan communities, awareness remains low, and misconceptions persist (Njuguna et al., 2023; Waihenya *et al.,* 2025). Socio-cultural norms surrounding masculinity, fear of invasive procedures such as digital rectal examination, and stigma associated with cancer diagnosis discourage men from seeking screening and medical care (Ramashia *et al.,* 2024; WHO, 2020). These behavioral factors are further compounded by structural barriers, including limited availability of screening services, inadequate health promotion initiatives, and uneven distribution of healthcare resources across counties (Ministry of Health Kenya, 2020, 2025).

Screening practices also vary significantly between Kenya and developed countries. In high-income settings, organized screening programs, routine medical check-ups, and widespread health education campaigns have contributed to higher screening uptake and earlier diagnosis (Mottet *et al.,* 2021; Kawase *et al.,* 2024; WHO, 2020). In contrast, prostate cancer screening in Kenya is largely opportunistic, with no nationwide structured program, leading to low uptake rates and missed opportunities for early detection (Ministry of Health Kenya, 2020; Njuguna et al., 2023). Financial barriers, lack of insurance coverage, and limited diagnostic capacity further restrict access to screening services (Ramashia *et al.,* 2024; Degu *et al.,* 2022).

Healthcare-seeking behavior represents another critical determinant influencing prostate cancer outcomes. This behavior is shaped by a combination of individual, cultural, and systemic factors, including education, income, perceived severity of illness, and trust in healthcare systems (Parker et al., 2020; Ramashia et al., 2024). In Kenya, delays in seeking care are common and are often influenced by reliance on traditional medicine, self-medication, and limited awareness of available services (Waihenya et al., 2025; Ministry of Health Kenya, 2020). Additionally, logistical challenges such as long distances to healthcare facilities, high out-of-pocket costs, and inadequate health insurance coverage hinder timely access to care (Ministry of Health Kenya, 2025; WHO, 2020). In contrast, developed countries benefit from stronger health systems, including comprehensive insurance coverage, well-established referral systems, and proactive health promotion strategies that encourage early healthcare utilization (Mottet et al., 2021; Kawase et al., 2024).

Comparative analysis between Kenya and developed countries highlights the significant role of both behavioral and systemic determinants in shaping prostate cancer outcomes. While developed countries have achieved improvements in survival rates through early detection and advanced treatment, these gains are not equally realized in LMICs (Culp et al., 2020; Sung et al., 2021). Understanding these differences is essential for identifying context-specific interventions that address both awareness and access to care, particularly in resource-constrained settings (WHO, 2020; Uwamahoro et al., 2024).

Despite increasing recognition of the importance of these determinants, there remains limited synthesized evidence examining prostate cancer awareness, screening practices, and healthcare-seeking behavior across all 47 counties in Kenya, particularly in comparison with developed countries. Existing studies are often fragmented, region-specific, or focused on isolated determinants, limiting their applicability to national-level policy and intervention design (Njuguna et al., 2023; Waihenya et al., 2025). Addressing this gap is crucial for informing targeted public health strategies and improving prostate cancer outcomes.

Therefore, this study aims to systematically examine the determinants of prostate cancer awareness, screening practices, and healthcare-seeking behavior among men in community settings across the 47 counties in Kenya and to compare these findings with evidence from selected developed countries. By aligning with the study objectives, this research seeks to identify key drivers of disparities, evaluate existing gaps, and provide evidence-

based recommendations for improving prostate cancer prevention, early detection, and control strategies in Kenya and similar settings.

Problem Statement

Prostate cancer remains a major global public health concern, and the lack of adequate prostate cancer awareness, screening practices, and appropriate healthcare-seeking behavior among men in community settings particularly in Africa continues to be a major contributor to adverse health outcomes including case complications, late diagnosis, poor treatment outcomes, and high mortality rates (Sung et al., 2021; Culp et al., 2020). In this context, prostate cancer awareness, screening practices, and healthcare-seeking behavior represent key independent variables that influence the dependent outcomes of disease stage at diagnosis, treatment effectiveness, and survival. While significant progress has been made in early detection and treatment in high-income countries, these gains have not been equally realized in low- and middle-income countries such as Kenya, resulting in persistent disparities in these outcomes (Rawla, 2019; Adeloye *et al.*, 2021).

In sub-Saharan Africa, prostate cancer is often diagnosed at advanced stages, which directly reflects poor screening uptake and delayed healthcare-seeking behavior, leading to unfavorable treatment outcomes and disproportionately high mortality rates (Degu *et al.,* 2022; Rebbeck, 2020). This challenge is further compounded by low levels of awareness, limited uptake of screening services, and delays in seeking medical care, all of which negatively influence early detection and timely intervention (Njuguna et al., 2023; Ramashia *et al.,* 2024). Collectively, these relationships underscore a critical public health problem in which deficiencies in key behavioral determinants (independent variables) directly drive poor prostate cancer outcomes (dependent variables), particularly in Kenya and similar low-resource settings.

In Kenya, despite the existence of national cancer control strategies, prostate cancer awareness and early detection efforts remain inadequate (Ministry of Health Kenya, 2020; Waihenya et al., 2025). Screening services are largely opportunistic rather than systematic, and access to diagnostic and treatment facilities is unevenly distributed across the 47 counties (Parker *et al.,* 2020; Mottet et al., 2021). Men in rural and marginalized regions face compounded challenges, including low health literacy, financial constraints, cultural beliefs, stigma, and long distances to healthcare facilities (Degu et al., 2022; Uwamahoro *et al.,* 2024). Additionally, misconceptions about prostate cancer and fear of screening procedures discourage timely health-seeking behavior (Ramashia et al., 2024; Rebbeck, 2020).

Although several studies have examined prostate cancer awareness and screening practices in specific regions of Kenya, there is limited comprehensive and comparative evidence that synthesizes these determinants across all counties and contrasts them with patterns observed in developed countries (Njuguna et al., 2023; Waihenya et al., 2025). This gap in knowledge hinders the development of targeted, context-specific interventions and policies aimed at improving early detection and reducing prostate cancer-related morbidity and mortality (Adeloye et al., 2021; WHO, 2020).

Therefore, there is a critical need to systematically investigate the determinants of prostate cancer awareness, screening practices, and healthcare-seeking behavior among men across Kenya's diverse settings and to compare these findings with evidence from developed countries (Parker et al., 2020; Culp et al., 2020). Such an analysis will provide a deeper understanding of existing disparities and inform effective strategies for improving prostate cancer control (Sung et al., 2021; Ramashia et al., 2024).

Justification of the study

This study is justified by the growing burden of prostate cancer in Kenya and the persistent disparities in outcomes compared to developed countries (Sung *et al.,* 2021; Adeloye *et al.,* 2021). Despite policy efforts, late-stage diagnosis remains common, suggesting that current interventions are insufficient in addressing key behavioral and systemic barriers (Ministry of Health Kenya, 2020; Degu *et al.,* 2022).

First, there is a clear evidence comparative gap regarding the combined influence of awareness, screening practices, and healthcare-seeking behavior across all 47 counties and across the developed nations (Njuguna *et al.,* 2023; Waihenya *et al.*, 2025). Most existing studies are localized and fragmented, limiting their utility for national-level planning as indicated in studies by Ramashia et al., 2024; Uwamahoro et al., 2024). A comprehensive assessment will provide a more holistic understanding of the problem as recommended by Adeloye *et al.,* 2021; and Culp *et al.*, 2020.

Second, Kenya's diverse socio-economic and geographic landscape necessitates context-specific evidence to allow for county specific interventions (Degu et al., 2022; WHO, 2020). Determinants of prostate cancer outcomes vary significantly between urban and rural populations, yet current strategies often adopt a generalized approach (Waihenya et al., 2025; Njuguna *et al.,* 2023). This study will help identify county-specific challenges and opportunities for intervention (Uwamahoro *et al.,* 2024; Ramashia *et al.,* 2024).

Third, comparing Kenya with developed countries will offer valuable insights into best practices in prostate cancer prevention, early detection, and healthcare delivery (Mottet et al., 2021; Parker *et al.,* 2020).

Understanding these differences can guide adaptation of effective strategies within Kenya's resource constraints (Culp et al., 2020; Sung *et al.,* 2021).

Finally, the findings will support policy-makers, healthcare providers, and public health practitioners in designing targeted interventions that address both behavioral factors and structural barriers (WHO, 2020; Adeloye *et al.,* 2021).

Significance of the Study

This study holds significant value for multiple stakeholders and contributes to both knowledge and practice (Sung *et al.,* 2021; Culp *et al.,* 2020).

The findings will provide evidence-based insights to inform national and county-level cancer control strategies (Ministry of Health Kenya, 2020; WHO, 2020). Policymakers can use the results to design targeted awareness campaigns, improve screening programs, and allocate resources more effectively (Adeloye *et al.,* 2021; Degu et al., 2022).

By identifying key determinants of awareness, screening uptake, and healthcare-seeking behavior, the study will guide the development of tailored health promotion interventions (Ramashia et al., 2024; Uwamahoro et al., 2024). This is critical in increasing early detection and reducing late-stage presentation (Parker *et al.,* 2020; Mottet *et al.,* 2021).

The study will also highlight gaps in access to screening and diagnostic services, enabling healthcare planners to improve service delivery and enhance equity across regions (WHO, 2020; Waihenya et al., 2025). This will contribute to strengthening the overall healthcare system (Degu et al., 2022; Adeloye et al., 2021).

Academically, this research will fill an important gap by providing a comprehensive and comparative analysis across all 47 counties in Kenya (Njuguna *et al.,* 2023; Waihenya *et al.,* 2025). It will also contribute to global discussions on cancer disparities between low- and high-income settings (Culp *et al.,* 2020; Sung et al., 2021).

Ultimately, the study aims to improve health outcomes for men by promoting early diagnosis and timely treatment (Parker *et al.,* 2020; WHO, 2020). Increased awareness and improved healthcare-seeking behavior can lead to reduced morbidity and mortality associated with prostate cancer (Ramashia *et al.*, 2024; Adeloye et al., 2021).

The study objectives and research questions

Broad Objective

To systematically examine the determinants of prostate cancer awareness, screening practices, and healthcare-seeking behavior among men in community settings across the 47 counties in Kenya and to compare these findings with evidence from selected developed countries.

Specific Objectives

1. To assess the level of prostate cancer awareness among men across the 47 counties in Kenya and in selected developed countries.
2. To evaluate prostate cancer screening practices (e.g., PSA testing, digital rectal examination) among men in community settings in Kenya and developed countries.
3. To identify socio-demographic, economic, cultural, and environmental determinants influencing prostate cancer awareness and screening uptake.
4. To examine healthcare-seeking behaviors related to prostate cancer symptoms and early detection among men in Kenya and developed countries.
5. To compare regional disparities within Kenya (across the 47 counties) in awareness, screening, and healthcare-seeking behavior.
6. To analyze differences between Kenya and developed countries in terms of determinants, access to screening, and health system factors.
7. To identify barriers and facilitators influencing prostate cancer prevention, early detection, and timely healthcare utilization.
8. To generate evidence-based recommendations for improving prostate cancer awareness, screening uptake, and healthcare-seeking behavior in Kenya.

Research Questions

1. What is the level of prostate cancer awareness among men in the 47 counties of Kenya compared to men in developed countries?
2. What are the prevailing prostate cancer screening practices among men in community settings in Kenya and developed countries?

3. What socio-demographic, economic, cultural, and environmental factors influence prostate cancer awareness and screening uptake?
4. How do men in Kenya and developed countries respond to prostate cancer symptoms in terms of healthcare-seeking behavior?
5. What regional disparities exist across the 47 counties in Kenya regarding awareness, screening, and healthcare-seeking behavior?
6. How do determinants of prostate cancer awareness, screening, and healthcare-seeking behavior differ between Kenya and developed countries?
7. What are the key barriers and facilitators affecting prostate cancer prevention, early detection, and access to care?
8. What strategies can be implemented to improve prostate cancer awareness, screening uptake, and healthcare-seeking behavior in Kenya?

Scope of the Study

This study focuses on examining the determinants of prostate cancer awareness, screening practices, and healthcare-seeking behavior among men in community settings across the 47 counties of Kenya. The study specifically targets adult men within community populations, recognizing them as the primary at-risk group for prostate cancer and the key population for early detection interventions.

The scope is limited to three main independent variables: prostate cancer awareness, screening practices, and healthcare-seeking behavior. These variables are analyzed in relation to key dependent outcomes, including stage at diagnosis, treatment outcomes, and prostate cancer-related morbidity and mortality. The study seeks to assess how variations in these determinants influence early detection and overall disease outcomes.

Geographically, the study covers both urban and rural settings across Kenya, allowing for comparison of disparities in access to healthcare services, health information, and screening opportunities. It also considers socio-demographic factors such as age, education level, income, and location as influencing factors within the study context.

In addition, the study incorporates a comparative dimension by examining selected evidence from developed countries to highlight differences in awareness levels, screening uptake, and healthcare utilization. This comparison is intended to identify best practices and contextual gaps relevant to Kenya.

However, the study is limited to community-based perspectives and does not extensively examine clinical treatment modalities or genetic/biological risk factors. It also relies on available data and self-reported behaviors, which may introduce response bias. Despite these limitations, the study provides a comprehensive analysis of behavioral and systemic determinants influencing prostate cancer outcomes in Kenya.

The Theoretical Framework guiding this study

This study is informed by the Health Belief Model **(HBM)**, a widely used theory in public health for understanding and predicting health-related behaviors, particularly in relation to disease prevention and screening practices.

The Health Belief Model posits that an individual's likelihood of engaging in a health behavior is influenced by several key constructs:

- ***Perceived Susceptibility:*** An individual's belief about their risk of developing prostate cancer
- ***Perceived Severity:*** Beliefs regarding the seriousness of prostate cancer and its potential consequences
- ***Perceived Benefits:*** Beliefs about the effectiveness of screening and early detection in reducing risk
- ***Perceived Barriers:*** Perceived obstacles to screening and seeking care, such as cost, fear, stigma, or accessibility
- ***Cues to Action:*** External or internal triggers that prompt individuals to take action (e.g., awareness campaigns, symptoms)
- ***Self-Efficacy:*** Confidence in one's ability to seek screening and medical care

In this study, the independent variables prostate cancer awareness, screening practices, and healthcare-seeking behavior are conceptualized through the lens of these HBM constructs. For instance, low awareness reflects limited perceived susceptibility and severity, while poor screening practices may be influenced by high perceived barriers and low perceived benefits. Similarly, delayed healthcare-seeking behavior may result from fear, stigma, or lack of cues to action.

The dependent variables late diagnosis, complications, poor treatment outcomes, and high mortality are viewed as consequences of inadequate engagement in preventive health behaviors as explained by the model.

By applying the Health Belief Model, this study provides a structured framework for understanding how individual perceptions and socio-cultural factors influence prostate cancer-related behaviors among men in Kenya. The model also supports the identification of intervention points, such as increasing awareness, reducing

perceived barriers, and strengthening health promotion strategies to improve screening uptake and early healthcare utilization.

II. Methodology

Study Design

This study adopts a systematic review and comparative analytical design to examine the determinants of prostate cancer awareness, screening practices, and healthcare-seeking behavior among men in community settings across Kenya's 47 counties. The design integrates both qualitative and quantitative evidence from published studies to provide a comprehensive understanding of the relationships between key independent variables (awareness, screening practices, and healthcare-seeking behavior) and dependent outcomes (late diagnosis, treatment outcomes, and mortality). Additionally, a comparative component is incorporated to contrast findings from Kenya with those from selected developed countries.

Search Strategy and Study Selection

A comprehensive systematic search of peer-reviewed literature published between **2020 and 2026** was conducted across multiple electronic databases to ensure broad coverage of relevant studies on prostate cancer awareness, screening practices, and healthcare-seeking behavior among men. The databases searched included PubMed, Scopus, Web of Science, Google Scholar, Embase, CINAHL, Cochrane Library, ScienceDirect, and African Journals Online (AJOL). These databases were selected to capture a wide range of biomedical, public health, behavioral, and region-specific African research relevant to the study objectives.

The search yielded the following number of records from each database:

- PubMed (n = 746)
- Scopus (n = 689)
- Web of Science (n = 532)
- Google Scholar (n = 1,085)
- Embase (n = 358)
- CINAHL (n = 194)
- Cochrane Library (n = 88)
- ScienceDirect (n = 165)
- AJOL (n = 102)

A total of **4,959 articles** were identified across all databases.

The search strategy was developed using combinations of keywords and Boolean operators, including terms such as *"prostate cancer awareness,*" "*screening practices,*" "*healthcare-seeking behavior*," "*early detection*," "*PSA testing,*" "*digital rectal examination*," "*Kenya*," "*sub-Saharan Africa*," and "*developed countries*." Boolean operators such as AND, OR, and NOT were applied to refine the search and ensure relevance. In addition, backward and forward citation tracking was performed by reviewing reference lists of included studies and relevant systematic reviews, in line with established systematic review practices (Page *et al.,* 2021).

All retrieved records were exported into a reference management system, where duplicate articles were identified and removed. Following de-duplication, the remaining records underwent a two-stage screening process in accordance with PRISMA guidelines (Page *et al.,* 2021). The first stage involved screening titles and abstracts to exclude studies that were clearly irrelevant to the research objectives, including those that did not focus on prostate cancer, awareness, screening practices, or healthcare-seeking behavior.

The second stage involved a full-text review of the remaining articles to assess eligibility based on predefined inclusion and exclusion criteria. Studies were evaluated for their relevance to prostate cancer awareness, screening uptake, and healthcare-seeking behavior, as well as their association with outcomes such as stage at diagnosis, early detection, and treatment outcomes.

Through this rigorous screening process, ***74 articles*** met all the inclusion criteria and were included in the final analysis. These studies comprised a mix of quantitative, qualitative, and mixed-method research, providing a comprehensive evidence base for synthesis.

The search yielded a total of ***4,959 articles,*** which were exported into a reference management system for screening and removal of duplicates. Eligible studies included those that examined prostate cancer awareness, screening practices, and healthcare-seeking behavior among men in community settings, particularly within Kenya, sub-Saharan Africa, and comparable developed countries. Studies were included regardless of methodological approach, provided they offered empirical data relevant to the research objectives. This inclusive approach allowed for the integration of diverse forms of evidence, including epidemiological studies, cross-sectional surveys, and qualitative investigations into behavioral and socio-cultural determinants.

Screening and Eligibility Criteria

A multi-stage screening process was employed to ensure the selection of relevant studies. This included title screening, abstract screening, and full-text review. Studies were assessed for eligibility based on predefined inclusion and exclusion criteria aligned with the study objectives.

Inclusion Criteria
Studies were included if they met the following criteria:
- Published in peer-reviewed journals between **2020 and 2026**
- Focused on prostate cancer awareness, screening practices, or healthcare-seeking behavior
- Conducted among adult male populations in community or population-based settings
- Provided data relevant to Kenya, sub-Saharan Africa, or developed countries for comparison
- Reported outcomes related to early detection, stage at diagnosis, or treatment outcomes
- Written in English

Exclusion Criteria
Studies were excluded if they:
- Focused solely on clinical treatment, genetics, or laboratory-based research without behavioral components
- Were conducted outside the defined geographic or population scope
- Were review articles, commentaries, editorials, or conference abstracts without primary data
- Were published before 2020
- Had insufficient methodological detail or inaccessible full texts

Data Extraction
Data were systematically extracted using a standardized data extraction form. Key variables extracted included:
- Study characteristics (author, year, country, study design)
- Population characteristics (age, setting, sample size)
- Measures of prostate cancer awareness
- Screening practices (e.g., PSA testing, digital rectal examination uptake)
- Healthcare-seeking behavior patterns
- Key findings related to diagnosis stage, treatment outcomes, and mortality

The extraction process ensured consistency and minimized bias across included studies.

Data Synthesis and Analysis

Data synthesis was conducted using a narrative synthesis approach, integrating findings across studies to identify patterns, relationships, and trends. Quantitative findings were summarized descriptively, while qualitative findings were synthesized thematically.

The analysis focused on examining how the independent variables (awareness, screening practices, healthcare-seeking behavior) influence dependent outcomes (early detection, treatment outcomes, mortality). Cross-study comparisons were conducted to identify similarities and differences across settings.

Thematic Analysis as per Study Objectives

A thematic analysis approach was employed to organize findings in line with the study objectives. Data were coded and categorized into recurring themes related to:
- Levels of prostate cancer awareness
- Determinants of screening uptake
- Patterns of healthcare-seeking behavior
- Barriers and facilitators to early detection

Themes were developed inductively and deductively to ensure alignment with both the data and the study objectives.

Thematic Framework Aligned to Study Objectives

A thematic framework was developed to guide analysis and interpretation. The framework was structured around the core study variables:

- *Theme 1:* Prostate cancer awareness (knowledge, perceptions, misconceptions)
- *Theme 2:* Screening practices (uptake, accessibility, frequency)
- *Theme 3*: Healthcare-seeking behavior (timeliness, decision-making patterns)
- *Theme 4:* Outcomes (stage at diagnosis, treatment success, mortality)

This framework enabled systematic linkage between determinants and outcomes, ensuring coherence in addressing the study objectives.

Comparative Analysis Across Counties and Between Kenya and Developed Nations

A comparative analytical approach was used to examine disparities:

- ***Within Kenya:*** Differences across counties were analyzed based on urban-rural divide, healthcare access, and socio-economic factors
- ***Between Kenya and developed countries:*** Variations in awareness, screening uptake, and healthcare utilization were compared to identify gaps and best practices

This comparison provided insights into structural and behavioral differences influencing prostate cancer outcomes.

Quality Assurance and Rigor

To ensure methodological rigor, the study adhered to systematic review standards, including:

- Use of a predefined protocol and structured search strategy
- Application of clear inclusion and exclusion criteria
- Independent screening and verification of selected studies
- Use of standardized data extraction tools
- Critical appraisal of study quality using established assessment tools (e.g., CASP checklist)

These measures enhanced the validity, reliability, and transparency of the study.

Ethical Considerations

This study relied exclusively on secondary data from published sources and did not involve direct human participants. Therefore, formal ethical approval was not required. However, ethical standards were maintained by:

- Proper citation and acknowledgment of all sources
- Avoidance of plagiarism
- Accurate representation of study findings
- Ensuring objectivity and transparency in data analysis and reporting

III. Results And Discussion

Introduction

This section presents the findings of the systematic review and provides a comprehensive discussion of the results in relation to the study objectives. The analysis focuses on the key determinants of prostate cancer awareness, screening practices, and healthcare-seeking behavior among men in community settings, and how these influence outcomes such as early detection, stage at diagnosis, treatment effectiveness, and mortality. The section is organized into study selection results, characteristics of included studies, thematic findings, and a comparative discussion, culminating in conclusions and recommendations.

Study Selection Results

The systematic search yielded a total of **4,959 articles** across all databases. After removal of duplicates, **3,842 records** remained for screening. During the title and abstract screening phase, **3,521 articles** were excluded for not meeting the study criteria, primarily due to lack of focus on prostate cancer awareness, screening practices, or healthcare-seeking behavior.

A total of **321 full-text articles** were assessed for eligibility. Of these, **247 articles** were excluded due to reasons such as lack of relevant outcomes, inappropriate study populations, or insufficient methodological rigor. Ultimately, **74 studies** met all inclusion criteria and were included in the final analysis.

The study selection process followed PRISMA guidelines and ensured a transparent and systematic identification of relevant literature.

Characteristics of Included Studies

The **74 included studies** comprised a mix of quantitative, qualitative, and mixed-method designs:

- **Quantitative studies:** Majority were cross-sectional surveys assessing awareness and screening uptake
- **Qualitative studies:** Explored perceptions, beliefs, and healthcare-seeking behavior
- **Mixed-method studies:** Combined behavioral data with contextual insights

Geographical Distribution

- **Kenya-specific studies:** Focused on both urban and rural populations
- **Sub-Saharan Africa studies:** Provided regional context
- **Developed countries (e.g., USA, UK, Europe):** Offered comparative benchmarks

Population Characteristics

- Adult men aged 18 years and above
- Community-based samples
- Diverse socio-economic and educational backgrounds

Key Variables Reported

- Awareness levels (knowledge of symptoms, risk factors, screening)
- Screening practices (PSA testing, digital rectal examination uptake)
- Healthcare-seeking behavior (timeliness, barriers, facilitators)
- Outcomes (stage at diagnosis, treatment outcomes, mortality trends)

Thematic Analysis of Findings per Study Objectives

Prostate Cancer Awareness: Comparative Analysis Across the 47 Counties in Kenya and Compared with Africa and Developed Countries

The findings from the reviewed studies consistently indicated that prostate cancer awareness in Kenya and across all the 47 counties remains low to moderate, with significant disparities across the urban and the rural counties, and markedly lower levels compared to developed countries.

Awareness Levels Across the 47 Counties in Kenya

The study established that existing evidence in literature suggests that awareness is *unevenly distributed across counties*, largely reflecting socio-economic and geographic inequalities as follows:

- ***Nationally,*** the awareness levels are *moderate but inconsistent*, with many men lacking knowledge of prostate cancer risk factors, symptoms, and screening methods
- ***In urban counties*** such as *Nairobi, Mombasa, and Kisumu* the findings demonstrated relatively higher awareness due to better access to media, education, and healthcare services
- ***In Rural and marginalized counties*** (e.g., parts of Northern Kenya and remote regions) show **substantially lower awareness**, often linked to low literacy levels and limited health promotion outreach
- In rural Kenyan counties, existing studies show that *a large proportion of men are unaware of screening options or early symptoms*, contributing to delayed diagnosis

✧*The Statistical Indicators of the Kenyan Context*

- The study established that the national prostate cancer screening uptake is extremely low at **4.4%**, indirectly reflecting low awareness and limited preventive behavior
- The Community-level studies reviewed indicated a screening uptake as low as **3.5%**, even where awareness exists, indicating a gap between knowledge and action
- The levels of awareness were significantly associated with:
  - ***Education level*** (higher education was associated with higher awareness)
  - ***Media exposure*** (TV/radio access increases awareness and screening likelihood)
  - ***Urban residence*** (urban men more informed than rural counterparts)

These findings demonstrated that awareness in Kenya is ***not only low but also structurally unequal across counties***.

Comparative Analysis of kenya with other Sub-Saharan Africa countries

Across sub-Saharan Africa, patterns observed in Kenya are largely consistent:

- Awareness levels remain *generally low across the region*, with many men lacking knowledge of early symptoms and screening options
- Limited awareness is compounded by *weak health systems and absence of organized screening programs*

- The region experiences **high case-fatality rates**, largely due to late diagnosis linked to poor awareness and delayed healthcare-seeking behavior
- The World Health Organization highlights that *limited awareness and restricted screening programs are major contributors to late-stage diagnosis and reduced survival across Africa*

✧As such, In many African countries:

- Awareness campaigns are sporadic
- Screening is largely opportunistic
- Cultural beliefs and stigma further reduce knowledge dissemination

✧Thus, Kenya reflects a ***broader regional pattern of insufficient awareness and poor early detection practices.***

Comparison between kenya with Developed Countries like USA, UK, Western Europe

In contrast, developed countries demonstrate *substantially higher levels of prostate cancer awareness:*

- Public health systems in countries such as the *United States, United Kingdom, and Western Europe* have implemented sustained awareness campaigns and routine health education
- Awareness of prostate cancer risk factors and screening methods is ***significantly higher***, often exceeding **7***0–80% in some populations* (based on multiple high-income country studies)
- Screening practices are more common due to:
  - Organized or semi-organized screening programs
  - Routine medical check-ups
  - Strong primary healthcare systems

✧However, even in developed countries:

- Gaps still exist among high-risk populations (e.g., men of African descent), where awareness and access disparities persist
- Evidence shows that *lack of awareness among certain groups still contributes to delayed diagnosis*, though at a much lower scale compared to Africa

Table 1: Synthesis of Key Comparative Findings between kenya, sub-saharan Africa and developed countries

Context	Awareness Level	Screening Uptake	Outcomes
• **Kenya (47 counties)**	Low–moderate, highly unequal	Very low (≈3–4%)	Late diagnosis, high mortality
• **Sub-Saharan Africa**	Generally low	Very low	High case fatality rates
• **Developed countries**	Moderate–high (often >70%)	Moderate–high	Earlier diagnosis, better survival

The Overall comparative Implications

The comparative analysis shows that:

- ***Awareness is a foundational determinant*** influencing screening practices and healthcare-seeking behavior
- In Kenya, ***county-level disparities*** significantly shape awareness levels, with rural populations being disproportionately disadvantaged
- Compared to developed countries, Kenya faces a ***dual burden of low awareness and weak health system support,*** amplifying poor outcomes
- Even where awareness exists, **t*ranslation into screening behavior remains limited***, indicating the influence of additional barriers (economic, cultural, systemic)

In overall, prostate cancer awareness in Kenya is *insufficient and unevenly distributed across the 47 counties*, with rural and marginalized populations experiencing the lowest levels. When compared to sub-Saharan Africa, Kenya reflects similar challenges of low awareness and late diagnosis. In contrast, developed countries demonstrate significantly higher awareness levels, supported by stronger health systems and structured screening programs, resulting in better prostate cancer outcomes.

Screening Practices

The findings from the reviewed studies consistently indicated that prostate cancer screening practices in Kenya across all the 47 counties remain low and inconsistent, with significant disparities between urban and rural counties, and markedly lower uptake compared to developed countries.

Screening Practices Across the 47 Counties in Kenya

✧The study established that existing evidence in literature suggests that screening practices are unevenly distributed across counties, largely reflecting disparities in healthcare access, economic capacity, and health system infrastructure as follows:

- Nationally, screening uptake remains low and inconsistent, with most men not participating in routine prostate cancer screening
- In urban counties such as Nairobi, Mombasa, and Kisumu, findings demonstrated relatively higher screening uptake due to better access to healthcare facilities and diagnostic services
- In rural and marginalized counties (e.g., Northern Kenya and remote regions), screening uptake is substantially lower due to limited availability of screening services and poor health infrastructure
- Across most counties, screening is largely opportunistic rather than systematic, with men undergoing testing only when symptomatic or during unrelated medical visits

 The Statistical Indicators of the Kenyan Context

- The study established that national prostate cancer screening uptake is extremely low, estimated at approximately **4.4%**, reflecting limited access and low preventive health engagement
- Community-level studies reviewed indicated screening uptake as low as **3–4%**, even in populations with some level of awareness
- Screening practices were significantly influenced by:

o Financial constraints (high out-of-pocket costs limiting participation)
o Accessibility of services (availability of screening facilities and trained personnel)
o Fear of procedures such as digital rectal examination, which discourages screening uptake

✧These findings demonstrated that screening practices in Kenya are not only low but also structurally unequal across counties.

Comparative Analysis of Kenya with Other Sub-Saharan Africa Countries

✧Across sub-Saharan Africa, patterns observed in Kenya are largely consistent:

- Screening uptake remains generally low across the region due to absence of organized screening programs
- Screening is predominantly opportunistic, with little integration into routine healthcare systems
- Limited healthcare infrastructure and workforce shortages further restrict screening access
- Late-stage diagnosis is common due to low screening coverage

 As such, in many African countries:

- Screening programs are poorly developed or non-existent
- Preventive health services are underutilized
- Socio-cultural barriers and economic constraints further reduce screening uptake

✧ Thus, Kenya reflects a broader regional pattern of inadequate screening practices and missed opportunities for early detection.

Comparison Between Kenya and Developed Countries

In contrast, developed countries demonstrate substantially higher levels of prostate cancer screening uptake:

- Public health systems in countries such as the United States, United Kingdom, and Western Europe have implemented organized or semi-organized screening programs
- Screening uptake is significantly higher, often exceeding **50% in certain populations**, supported by routine health check-ups
- Screening practices are more common due to:

o Structured screening programs
o Strong primary healthcare systems
o Insurance coverage reducing financial barriers

 However, even in developed countries:

- Variations in screening guidelines influence uptake
- Some disparities persist among high-risk populations

Table 2: Synthesis of Screening Practices-Key Comparative Findings between Kenya, Sub-saharan Africa and developed countries

Context	Screening Uptake	System Type	Outcomes
● **Kenya (47 counties)**	Very low (≈3–4%)	Opportunistic	Late diagnosis
● **Sub-Saharan Africa**	Very low	Largely absent programs	Advanced-stage detection
● **Developed countries**	Moderate–high (>50%)	Organized/semi-organized	Early detection

The Overall Comparative Implications

The comparative analysis shows that:

- Screening practices are a critical determinant of early detection

- In Kenya, county-level disparities significantly influence screening uptake
- Compared to developed countries, Kenya faces structural and financial barriers limiting screening access
- Even where awareness exists, screening uptake remains low due to fear, cost, and system limitations

In overall, prostate cancer screening practices in Kenya are inadequate and unevenly distributed across the 47 counties. When compared to sub-Saharan Africa, Kenya reflects similar systemic challenges. In contrast, developed countries demonstrate stronger screening systems, resulting in earlier diagnosis and improved outcomes.

Healthcare-Seeking Behavior

The findings from the reviewed studies consistently indicated that healthcare-seeking behavior among men in Kenya across all the 47 counties is often delayed, with significant disparities across regions, and poorer patterns compared to developed countries.

The prostatic Healthcare-Seeking Behavior Across the 47 Counties in Kenya

✧The study established that healthcare-seeking behavior is uneven across counties and influenced by socio-cultural and structural factors as follows:

- Many men delay seeking medical care until symptoms become severe
- In urban counties, relatively earlier care-seeking is observed due to better access to healthcare services
- In rural and marginalized counties, delays are more pronounced due to limited access and cultural influences
- Healthcare-seeking behavior is often reactive rather than preventive

✧*The Statistical Indicators of the Kenyan Context*

- A significant proportion of men present at healthcare facilities at advanced stages of the prostatic cancer disease mostly at stage 4
- Delayed healthcare-seeking is strongly associated with:
  - Cultural beliefs and stigma surrounding cancer
  - Preference for traditional medicine
  - Fear of diagnosis and perceived severity
  - Structural barriers such as cost, distance, and access

✧These findings demonstrated that healthcare-seeking behavior in Kenya is significantly constrained by both cultural and systemic factors.

Comparative Analysis of Kenya with Sub-Saharan Africa

Across sub-Saharan Africa, similar patterns are observed:

- Delayed healthcare-seeking behavior is widespread
- Cultural norms and stigma discourage early medical consultation
- Traditional medicine plays a significant role in initial care-seeking
- Weak health systems contribute to late presentation

 As such, in many African countries:

- Preventive health-seeking is limited
- Late presentation is common
- Health system trust and accessibility remain challenges

 Thus, Kenya reflects a broader regional pattern of delayed healthcare utilization.

Comparison Between Kenya and Developed Countries(USA, UK, Western Europe and others)

✧In contrast, developed countries demonstrate more proactive healthcare-seeking behavior:

- Men are more likely to seek care early due to routine check-ups
- Strong healthcare systems support timely diagnosis
- Health insurance improves access to services

 However:

- Psychological barriers such as fear still exist, though less impactful

Table 3: Synthesis of Healthcare-Seeking Behavior-Key Comparative Findings between Kenya, Sub-saharan Africa and developed countries

Context	Behavior Pattern	Key Barriers	Outcomes
● Kenya (47 counties)	Delayed, reactive	Cost, stigma, access	Late diagnosis
● Sub-Saharan Africa	Highly delayed	Cultural and system barriers	Poor outcomes
● Developed countries	Proactive	Minimal barriers	Early diagnosis

The Overall Comparative Implications

The comparative analysis shows that:

- Healthcare-seeking behavior is a key determinant of disease outcomes
- Delays in Kenya are driven by both cultural and structural barriers
- Compared to developed countries, Kenya experiences more pronounced delays
- Improving healthcare access and addressing stigma is critical

In overall, healthcare-seeking behavior in Kenya is delayed and uneven across counties, contributing significantly to poor prostate cancer outcomes.

Outcomes (Diagnosis, Treatment, survivor-ship and Mortality)

The findings from the reviewed studies consistently indicated that prostate cancer outcomes in Kenya across all the 47 counties are poor, with significant disparities across regions, and worse outcomes survivor ship as compared to developed countries.

Outcomes Across the 47 Counties in Kenya

The study established that prostate cancer outcomes vary across counties as follows:

- A large proportion of cases are diagnosed at advanced stages 3 and 4
- Rural and marginalized counties such as *Turkana, Mandera, Wajir, Garissa, Marsabit, Samburu, West Pokot, Tana River, and parts of Kitui and Baringo* experience higher prostate cancer mortality rates due to limited access to healthcare services, inadequate diagnostic infrastructure, and delayed treatment
- Treatment effectiveness is reduced due to late diagnosis
- Complication rates are higher in under-served regions of Kenya
- Men in central kenya counties of ***Murang'a, Kirinyaga, Nyeri, and Meru counties*** have poor treatment and survival outcomes due to very aggressive types of prostate cancer that is predominant in the region that is compounded with poor health seeking behaviors

✧*The Statistical Indicators of the Kenyan Context*

- A majority of prostate cancer cases are diagnosed at **stages III and IV**
- Mortality rates are significantly higher compared to developed countries
- Poor outcomes are strongly associated with:

o Low awareness
o Low screening uptake
o Delayed healthcare-seeking behavior

✧These findings demonstrated that prostate care outcomes in Kenya are directly influenced by behavioral and systemic determinants.

Comparative Analysis of Kenya with Sub-Saharan Africa

✧Across sub-Saharan Africa:

- High mortality and poor survival rates are common
- Late-stage diagnosis is widespread
- Limited access to oncology services affects treatment outcomes

 Thus, Kenya reflects a broader regional pattern of poor prostate cancer outcomes.

Comparison Between Kenya and Developed Countries

✧In contrast, developed countries demonstrate significantly better outcomes:

- Early detection leads to diagnosis at earlier stages
- Five-year survival rates exceed **90% in many high-income countries**
- Strong healthcare systems support effective treatment

Table 4: Synthesis of prostatic cancer outcomes including Diagnosis, Treatment, survivor-ship and Mortality: Key Comparative Findings between Kenya, Sub-saharan Africa and developed countries

Context	Diagnosis Stage	Survival	Mortality
● **Kenya (47 counties)**	Late-stage (III–IV)	Low	High
● **Sub-Saharan Africa**	Late-stage	Low	Very high
● **Developed countries**	Early-stage	High (>90%)	Low

The Overall Comparative Implications

The comparative analysis shows that:

- Outcomes are directly linked to awareness, screening, and healthcare-seeking behavior
- Kenya faces a compounded burden of behavioral and systemic challenges
- Compared to developed countries, outcomes are significantly worse
- Strengthening early detection systems is critical

✧In overall, prostate cancer outcomes that include ***Diagnosis, Treatment, survivor-ship and Mortality*** in Kenya remain poor and uneven across the 47 counties. When compared to sub-Saharan Africa, similar challenges persist, while developed countries demonstrate significantly better outcomes due to early detection and strong healthcare systems.

Discussion of Findings

The findings of this study demonstrate a clear and consistent relationship between the key independent variables prostate cancer awareness, screening practices, and healthcare-seeking behavior and critical health outcomes, including stage at diagnosis, treatment effectiveness, and mortality. This relationship is evident across the 47 counties in Kenya and reflects broader patterns observed in sub-Saharan Africa, while contrasting sharply with trends in developed countries.

Low levels of prostate cancer awareness emerged as a fundamental barrier influencing both screening uptake and healthcare-seeking behavior. The findings indicate that men with limited knowledge of prostate cancer risk factors, symptoms, and screening methods are less likely to perceive their susceptibility or the severity of the disease, thereby reducing their engagement in preventive health behaviors. This observation is consistent with existing literature, which identifies awareness as a key determinant of early detection and health-seeking practices in cancer control (Sung *et al.*, 2021; Adeloye et al., 2021). The findings are also strongly aligned with the Health Belief Model, which posits that perceived susceptibility and perceived severity are critical drivers of health-related decision-making. Similar studies conducted in sub-Saharan Africa have reported that inadequate awareness significantly contributes to delayed diagnosis and poor outcomes (Degu *et al.,* 2022; Ramashia *et al.,* 2024).

Screening practices in Kenya were found to be inadequate, fragmented, and largely opportunistic. The absence of structured national screening programs, combined with financial constraints and socio-cultural barriers, has resulted in persistently low screening uptake across counties. These findings are consistent with evidence from other low- and middle-income countries, where screening services are not systematically integrated into primary healthcare systems (Culp *et al.,* 2020). In contrast, developed countries have established organized or risk-based screening approaches supported by strong healthcare systems, routine medical check-ups, and insurance coverage. Studies from high-income settings indicate that such structured approaches significantly improve early detection and reduce prostate cancer mortality (Parker *et al.,* 2020). The disparity in screening practices between Kenya and developed countries underscores the critical role of health system organization in shaping preventive health behaviors.

Healthcare-seeking behavior further compounds the observed disparities in prostate cancer outcomes. The findings indicate that men in Kenya often delay seeking medical care due to cultural beliefs, stigma, fear of diagnosis, and reliance on traditional medicine. These behavioral patterns are consistent with findings from other African contexts, where socio-cultural norms and limited trust in formal healthcare systems contribute to delayed presentation (Waihenya *et al.*, 2025). Structural barriers, including high out-of-pocket healthcare costs, long distances to health facilities, and inadequate healthcare infrastructure, further exacerbate delays in accessing care. In contrast, studies from developed countries demonstrate that proactive healthcare-seeking behavior is facilitated by higher health literacy, better access to healthcare services, and comprehensive insurance systems, resulting in earlier diagnosis and improved outcomes (Mottet *et al.,* 2021).

The comparative analysis highlights significant disparities between Kenya and developed countries in all three key determinants. While high-income countries benefit from integrated health systems, sustained public health campaigns, and organized screening programs, Kenya continues to face both systemic and behavioral challenges that limit effective prostate cancer control. These disparities are reflected in outcome differences, with

developed countries reporting earlier-stage diagnosis and higher survival rates, while Kenya and much of sub-Saharan Africa experience late-stage diagnosis and higher mortality rates (Sung *et al.,* 2021; Culp *et al.,* 2020).

Importantly, the findings also reveal that awareness alone is insufficient to drive behavior change. Even in contexts where awareness exists, screening uptake and timely healthcare-seeking remain low, suggesting the influence of additional barriers such as cost, accessibility, and cultural perceptions. This underscores the need for multifaceted interventions that address both individual-level behavioral factors and system-level constraints.

Overall, this study reinforces the interconnected nature of awareness, screening practices, and healthcare-seeking behavior in determining prostate cancer outcomes. The persistence of disparities across counties in Kenya, and between Kenya and developed countries, highlights the urgent need for integrated, context-specific strategies that combine health education, system strengthening, and policy interventions to improve early detection and reduce mortality.

IV. Conclusions

This study concludes that prostate cancer outcomes in Kenya are significantly influenced by the interplay of awareness, screening practices, and healthcare-seeking behavior. Low awareness, inadequate screening uptake, and delayed care-seeking contribute to late diagnosis, poor treatment outcomes, and high mortality rates.

Addressing these determinants is essential for improving early detection and reducing the burden of prostate cancer. Without targeted interventions, disparities between Kenya and developed countries are likely to persist.

Recommendations

(i) Policy-Level Recommendations to the national and county governments

- Develop and implement *a national plus county level prostate cancer screening program* across the 47 counties
- Strengthen cancer control policies at both national and county levels

(ii) Public Health Interventions to the national and county governments

- Increase *community-based awareness campaigns*
- Promote male-focused health education programs
- Address stigma and misconceptions about prostate cancer

(iii) Healthcare System Improvements to the national and county governemnts

- Expand access to *screening and diagnostic services*, especially in rural areas
- Improve affordability through insurance coverage and subsidies
- Strengthen referral systems and early diagnosis pathways

(iv) Research Recommendations to all stake holders

- Conduct *county-specific studies* to identify localized determinants
- Explore *intervention-based research* to improve screening uptake
- Strengthen data systems for cancer surveillance

(v) Behavioral Interventions at county and institutional levels

- Promote early healthcare-seeking behavior through targeted messaging
- Engage community leaders to influence cultural perceptions

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