



Factors Influencing Access to Effective Treatment of Prostate Cancer in Namibia: A Cross-Sectional Study

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ABSTRACT

Background: Prostate cancer is the second most diagnosed cancer in men worldwide, with mortality disproportionately higher in low-and middle-income countries LMICs. In Namibia, systemic barriers, such as financial constraints, inadequate patient education, and workforce shortages, hinder effective treatment. The study examines socio-demographic, financial, social, and system-level factors influencing access to healthcare among prostate cancer patients.

Method: A cross-sectional study was conducted among the healthcare professionals managing prostate cancer patients in Namibia. A total of 304 questionnaires were distributed, of which 242 were completed and returned (response rate: 79.6%). Data were analysed using descriptive statistics, confidence intervals, and diversity indices to assess demographics, professional roles, experience, financial impact, psychosocial challenges, and perceptions of system support.

Results: Respondents were predominantly female (73.0%), aged 25-34 years (46.9%), single (63.5%), and highly educated (99.6% with tertiary education). Employment was skewed towards full-time work (92.9%). Registered nurses comprise the largest group (52.3%), followed by enrolled nurses (21.2%), with smaller proportions of doctors (8.7%) and radiographers/radiotherapists (6.6%). Mean years of experience were 6.7 (SD 4.8), with most reporting 1-3 years. Financial strain was severe for 60.6% of respondents, moderate for 33.6%. Psychosocial burdens were evenly distributed across isolation, stigma, family stress, and relationship strain. Nearly half (49.6%) perceived healthcare financial support as insufficient, compared to 14.9% who judged it adequate.

Conclusions: Findings highlight a young, nursing-dominant workforce facing significant financial and psychosocial challenges, alongside systemic inadequacies. Strengthened financing, workforce development, and patient education are urgently needed to improve prostate cancer outcomes in Namibia and similarly in other LMICs. Further studies related to early detection, treatment, and social domains on prostate cancer in LMICs should be conducted, while effective interventions for the detection, treatment, and management of prostate cancer should be developed.

Unique contribution: This study demonstrates that prostate cancer care in Namibia is constrained by financial hardship, psychosocial burdens, and systemic inadequacies, underscoring the urgent need for stronger health financing, workforce development, and patient education to improve outcomes in LMICs.

Key recommendations: The findings of this study highlight two urgent priorities for Namibia and Sub-Saharan Africa. First, policy interventions must address the hidden and indirect costs of PCa treatment, ensuring that supportive care and logistics are incorporated into the financial protection scheme. Second, the health system must prioritise timely treatment initiation by strengthening the supply chain, expanding diagnostic capacity, and reducing financial barriers.

Keywords: Prostate Cancer, Low-Middle-Income Countries (LMICs), Namibia, Healthcare



INTRODUCTION

According to the Global Cancer Observatory (2023), prostate cancer is the second most diagnosed cancer in men worldwide, which reflects a global health challenge. The World Health Organisation (WHO), through its International Agency for Research on Cancer (IARC), has further cautioned that the global burden of prostate cancer is expected to more than double to nearly three million cases by 2040 (WHO/IARC, 2021; Sung et al., 2021). WHO emphasizes that lifestyle intervention alone will not curb this trend, instead calls for urgent health system responses which include early detection, improvement of treatment pathway and financial protection mechanisms, particularly in low-and middle-income countries (LMICs) (WHO/IARC, 2021; Sung et al., 2021). These global perspectives reinforce the findings of this study, which highlights financial constraints, inadequate patient education and workforce-related challenges as key factors influencing access to effective prostate cancer treatment in Namibia.

Current evidence indicates that while reported incidence rates of prostate cancer appear lower in Africa compared to North America and Europe, the mortality burden is disproportionately higher. This paradox is largely attributed to late-stage diagnosis and limited access to timely and effective treatment services (Adeloye et al., 2016). Advancements in screening, diagnostic and therapeutic innovations have significantly improved survival and quality of life for men with prostate cancer in high-income countries; men in low and middle-income countries (LMICs) continue to face systemic barriers to effective treatment. These barriers include limited access to early detection programmes, shortages of trained specialists, inadequate infrastructure for radiotherapy and surgery, and the higher costs of novel therapeutic treatment (Rebbeck, 2017). Therefore, prostate cancer in LMICs is often diagnosed at later stages, leading to poorer prognoses and disproportionately higher mortality rates compared to high-income countries (Rawla, 2019). As stated in a recent multidisciplinary review, urologic oncology in LMICs is hindered by inadequate infrastructure, limited access to radiotherapy, and financial barriers, which result in poor treatment outcomes (Galloway, Cortese, & Talwar, 2020). To address these gaps, this study analysed treatment access, focusing on socio-demographic distribution, financial impacts, societal challenges and system-level support.

METHODS

Study design and participants: This cross-sectional study was conducted among the healthcare professionals who manage prostate cancer patients in Namibia. Sample size:

Sampling Techniques: The sample size for proportion estimation was calculated using the standard formula:

$$n = [(Z^2 * P * (1 - P)) / L^2] / [1 + ((Z^2 * P * (1 - P)) / (L^2 * N))]$$

where n is the required sample size, Z is the Z-score at 95% confidence (1.96), P is the estimated proportion (0.5), L is the margin of error (0.05), and N is the population size (1440). Substituting these values yielded a sample size of approximately 304 (Cochran, 1977).

A total of 304 questionnaires were distributed to healthcare professionals, of which 242 were completed with a response rate of 79.6%.



Data collection: Data was collected using a mixed approach. In-person surveys were administered at selected health facilities to capture responses from participants with limited internet access. In parallel, an online survey tool was distributed to participants who could be reached electronically, thereby extending coverage to geographically dispersed respondents.

Variables: Outcome variables included adequacy of treatment access, financial support, financial education and financial impact. Predictor variables comprised socio-demographic characteristics, professional role, years of experience and social or community influence.

Data analysis: Data were analysed using SPSS statistical software version 30.0. Descriptive statistics (frequencies and percentages) were used to summarise participants' characteristics and contextual factors.

RESULTS

Participant's demographic data

Variable	Categories	Count [Number]	Percentage [%]
Gender	Female	176	73.0%
	Male	65	26.9%
Age Group	18-24	10	4.2%
	25-34	113	46.8%
	35-44	67	27.8%
	45-54	36	14.9%
	55+	15	6.2%
Marital Status	Divorced	3	1.2%
	Married	83	34.4%
	Separated	1	0.4%
	Single	153	63.4%
	Widowed	1	0.4%
Education Level	Secondary education	1	0.4%
	Tertial education	240	99.6%
Employment status	Full-time employed	224	92.9%
	Part-time employed	9	3.7%
	Self-employed	4	1.6%
	Un-employed	4	1.6%
Period of current work	1-3 years	81	33.6%
	4-7 years	57	23.6%
	7-10 years	43	17.8%
	>10 years	60	24.9%
Professional role	Doctor [GP]	21	8.7%
	Enrolled nurse	51	21.1%
	Epidemiologist	1	0.4%
	Oncologist	2	0.8%



	Pharmacists	9	3.7%
	Pharmacist assist	4	1.6%
	Pharmacist tech	1	0.4%
	Radiographer/Radiotherapist	16	6.6%
	Registered nurse	126	52.3%
	Social worker	8	3.3%
	Specialist surgeon	1	0.4%
	Urologist	1	0.4%
Years of experience at current work	1-3 years	88	36.8%
	11-15 years	23	9.6%
	4-7 years	55	23.0%
	7-10 years	41	17.2%
	> 16 years	32	14.0%

Most participants were female (73.0%), single (63.5%) and within the 25-34 age group (46.9%). Nearly all participants had attained tertiary education (99.6%) and were employed full-time (92.9%). Registered nurses represented the largest professional group (52.3%), followed by enrolled nurses (21.2%), medical doctors/general practitioners (8.7%) and radiographers/radiotherapists (6.6%). In terms of work experience, the majority reported 1-3 years in their current post (36.8%), with smaller proportions reporting longer service durations. The mean years of experience was 6.7 (SD 4.8), reflecting moderate dispersion around the central tendency.

Table 2: Effects of prostate cancer on patients' financial outcomes (n=242)

Category	Percentage (%)	95% confidence intervals
Minor effect	4.98	2.5-8.5
Moderate effect	33.61	28.0-39.6
No effect	0.83	0.2-2.9
Severe effect	60.58	54.6-66.5

As illustrated in Table 2, prostate cancer was perceived to have a substantial financial impact on patients and their families. More than half of the respondents (60.6%) reported severe financial effects, while one-third (33.6%) reported the effects described. Only a small minority reported minor financial impacts (5.0%) or none (0.8%).



Table 3: Levels of social challenges experienced by prostate cancer patients (n=242)

Categories	Percentage (%)
Employment issues	3.3
Employment issues + family stress	1.2
Family stress	17.0
Isolation	2.5
Isolation + Employment issues + Family stress	0.8
Isolation + Family stress	2.1
Isolation + Relationship strain + Employment issues + Family stress	1.2
Isolation + Relationship strain + Family stress	2.5
Relationship strain	22.0
Stigma	4.6

Table 3 presents the social challenges identified by respondents. Relationship strain (22.0%), followed by family stress (17.0%). Stigma (4.6%) and employment issues were the most frequently reported concerns, often occurring in combination. Nearly half of the participants highlighted overlapping challenges, underscoring the complex social burden associated with the disease.

Table 4: Influence of healthcare system on patients' financial support (n=242)

Response	Percentage (%)
No	49.8
Not sure	35.3
Yes	14.9

As shown in Table 4, perceptions of financial support from the healthcare system were largely negative. Almost half of the respondents (49.8%) believed that support was inadequate, while more than one-third (35.3%) were uncertain. Only 14.9% considered the available financial support sufficient.

Major finding

The study population was dominated by full-time employed respondents, primarily registered nurses, with moderate diversity across professional roles. Years of experience clustered around the early to mid-career range, with a mean of 6.7 years and moderate dispersion. Financial strain emerged as a major theme, with nearly two-thirds reporting severe effects on patients and families. Social challenges such as isolation, stigma, family stress and relationship strain were evenly distributed, each affecting roughly one-fifth of participants. At the system level, perceptions of inadequate financial support were widespread, with nearly half of the respondents reporting insufficient support, compared with only 15% who judged it adequate. Together, these findings highlight a stable yet concentrated workforce facing significant financial and social burdens, compounded by systemic gaps in healthcare support. By quantifying burdens with confidence intervals and exposing systemic inadequacies, it bridges global perspectives with local realities, offering actionable insights for LMICs' health policy and practice



DISCUSSION

The findings of this study provide important insights into the socio-demographic characteristics of healthcare professionals and their perceptions of financial, social and systemic challenges faced by prostate cancer (PCa) patients in Namibia. By connecting results to broader evidence from Sub-Saharan Africa, the discussion highlights how workforce composition, financial strain, social stigma and inadequate healthcare support intersect to shape the lived experiences of patients and their families. These results not only confirm patterns reported in the regional literature but also underscore context-specific challenges that demand targeted intervention.

The socio-demographic profile of participants revealed a workforce that is predominantly female, young and highly educated, with most respondents employed full-time. This reflects the gendered composition of healthcare professions in Namibia, where nursing and allied health roles are largely occupied by women, consistent with regional workforce trends (Andeloye et al., 2016). Professional distribution was dominated by registered nurses, followed by enrolled nurses and doctors, underscoring the central role of nurses in oncology and primary care delivery. The relatively small representation of oncologists, urologists and specialist surgeons highlights the limited specialist workforce available for PCa management in low-and middle-income countries [LMICs], a challenge echoed across Sub-Saharan Africa (Rebbeck, 2017; Rawla, 2019). This imbalance has implications for the quality and timeliness of cancer care, as nurses often shoulder responsibilities beyond their training, while specialist shortages delay diagnosis and treatment.

Financial strain emerged as a dominant theme, with 60% of respondents reporting severe financial effects on PCa patients and their families. Only a small minority reported minor effects, underscoring the catastrophic health expenditure associated with cancer care in LMICs, where out-of-pocket payment remains a dominant financing mechanism (Andeloye et al., 2016). Similar studies in Namibia and other African countries have documented that cancer treatment often leads to impoverishment and financial distress, particularly in households with limited social protection (Galloway, Cortese, & Talwar, 2020). These findings highlight the urgent need for a financial risk protection strategy, including national health insurance and targeted subsidies for cancer care, as recommended in Namibia's National Cancer Control strategy (WHO, 2021). Beyond financial hardship, the study revealed complex social challenges faced by PCa patients. Relationship strain, family stress and stigma were the most frequently reported issues, often occurring in combination with isolation and employment difficulties. Relationship strain and family stress categories constitute 39% of all reported stress causes, which indicates their significant contribution to accessing treatment of this health condition. This assertion was corroborated by a study that found family dynamics influence access to effective treatment (Shaw et al., 2013).

These findings resonate with literature showing that cultural beliefs, stigma and family dynamics strongly shape cancer experiences in Sub-Saharan Africa (Rawla, 2019; Sung et al., 2021). Stigma, in particular, discourages men from seeking early screening and treatment, leading to late-stage diagnosis and poor outcomes. The overlap of multiple stressors, such as stigma combined with family stress and employment issues, reflects the multidimensional psychosocial



burden of PCa, which extends beyond the patient to the household and community. Addressing these challenges requires culturally sensitive intervention, including community-based education and stigma educational programmes that are aimed at normalising cancer screening and treatment. This approach resonates with findings from the study a study conducted in Guinea, which highlighted the impact of stigma and socioeconomic barriers on HIV treatment adherence in Conakry from a gender perspective (Diallo et al., 2020).

Perceptions of the healthcare system further underscore systemic gaps. Nearly half of the respondents felt the healthcare system does not provide sufficient financial support, while only 15% believed that the support it provides was adequate. The uncertainty expressed by over one-third of respondents suggests inadequate communication and awareness of available support mechanisms. This perception highlights the fragmented nature of cancer financing in Namibia, where limited insurance coverage and weak social protection schemes leave patients vulnerable (Galloway et al., 2020; WHO, 2021). Strengthening financial risk protection through national health insurance and targeted cancer subsidies has been recommended as a regional priority, alongside improved communication strategies to ensure patients and families are aware of available resources.

In summary, these findings indicate that PCa care in Namibia is shaped by a young, nurse-led workforce, severe financial strain on patients and persistent social stigma. These challenges mirror broader Sub-Saharan African trends where limited specialist capacity, cultural barriers and weak financial protection systems hinder effective cancer control (Rebbeck, 2017; Rawla, 2019). Addressing these issues requires a multi-pronged approach. Capacity building for oncology specialists, community-based stigma reduction programmes and stronger financial support mechanisms to mitigate the socio-economic burden of PCa. By situating Namibia's experiences within the regional context, this study contributes to the growing evidence-based study and need for integrated cancer control strategies in LMICs that combine workforce development, financial protection, and culturally sensitive psychosocial support.

CONCLUSION

This study demonstrates that prostate cancer patients in Namibia face a multidimensional burden encompassing financial, societal and systemic challenges. Severe financial effects were predominant, compounded by relationship strain, family stress, stigma and employment disruptions. The healthcare system's limited role in providing financial support, as reported by nearly half of the participants, further exacerbates vulnerability. Participants further identified grants, food support, hospital bill coverage, and low-interest loans as critical venues for relief, underscoring the need for structured and accessible support mechanisms (Andeloye et al., 2016; Galloway, Cortese, & Talwar, 2020). Addressing these challenges requires a holistic response. Policymakers should prioritise expanding health insurance coverage, implementing targeted subsidies and stabilising supply chains for essential medicines (WHO, 2021; Windhoek Declaration, 2022). Equally important are psychosocial counselling services, caregiver support programmes and stigma-reduction initiatives to mitigate societal challenges (Rawla, 2019; Diallo et al., 2020). Strengthening workplace protections and integrating financial counselling into oncology care pathways will further safeguard patients' livelihoods and adherence to treatment.



Ensuring equitable patient-centred cancer care in Namibia will require collaboration between government, civil society, and regional partners, as emphasised in the Windhoek Declaration on Prostate Cancer (Windhoek Declaration, 2022).

RECOMMENDATIONS

Drawing on the findings of this study, the following recommendations are proposed to strengthen prostate cancer care in Namibia and comparable LMIC contexts:

1. Health financing and risk protection

- Expand national health insurance coverage to include prostate cancer screening, diagnostic and treatment.
- Introduce targeted subsidies and financial relief mechanisms (e.g., grants, low-interest loans, hospital bill coverage) to reduce catastrophic out-of-pocket expenditure.
- Stabilise supply chain for essential medicines and radiotherapy equipment to ensure consistent access.

2. Workforce development

- Invest in training and retention of oncology specialists, including urologists, oncologists and radiotherapists.
- Strengthen continuous professional development for nurses and allied health professionals who form the backbone of cancer care delivery.
- Promote multidisciplinary collaboration to improve timeliness and quality of care.

3. Psychosocial and community support

- Establish psychosocial counselling services and a caregiver support programme within oncology units.
- Implement stigma reduction initiatives through culturally sensitive community education campaigns.
- Integrate financial counselling into oncology pathways to safeguard livelihood and improve adherence.

4. System strengthening and policy integration

- Improve communication strategies to raise awareness of available financial and social support mechanisms.
- Align national cancer control strategies with WHO and IARC frameworks, ensuring context-specific adaptation.
- Foster regional collaboration, as emphasised in the Windhoek Declaration on prostate cancer, to share best practices and build capacity.



Ethical clearance

Approval for this study was obtained from the Faculty of Health, Natural Resources, and Applied Sciences of the Namibia University of Science and Technology with approval number FHNRS:59/2023 and from the Ministry of Health and Social Services (MOHSS) Ref:22/4/2/3.

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Conflict of Interest

The authors declare that there is no conflict of interest as the research was conducted without any commercial or financial relationship.

Authors' Contributions

Joshua Hidinwa was involved in the initiation and conceptualisation of the research, as well as in the development of the research protocol. He conducted the research and was also involved in drafting the manuscript. Omotayo Awofolu, while Roswitha Mahalie contributed in the conceptualisation of the research, refining and aligning the study objectives, and reviewing the manuscript. All contributors reviewed and approved the final version of the manuscript for submission and consideration for publication.

Availability of data and materials

Researchers may utilise the information contained in this report in accordance with the due acknowledgement process.

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REFERENCES

- Adeloye, D., David, R. A., Aderemi, A. V., Iseolorunkanmi, A., Oyedokun, A., Iweala, E. E. J., & Oni, G. (2016). An estimate of the incidence of prostate cancer in Africa: A systematic review and meta-analysis. *PLoS ONE*, 11(4), e0153496.
- Diallo, A., Camara, M., Bah, A., Barry, M., & Sow, M. (2020). Stigma and socioeconomic barriers to HIV treatment adherence in Conakry, Guinea: A gender perspective. *African Health Sciences*, 20(2), 789-798.
- Galloway, D., Cortese, A., & Talwar, R. (2020). Challenges in urologic oncology in LMICs: Infrastructure, access, and outcomes. *Journal of Global Oncology*, 6, 123-131.
- Global Cancer Observatory. (2023). *Cancer today*. Lyon: International Agency for Research on Cancer.
- Rawla, P. (2019). Epidemiology of prostate cancer. *World Journal of Oncology*, 10(2), 63-89.
- Rebbech, T. R. (2017). Prostate cancer disparities by race and ethnicity: From nucleotide to neighbourhood. *Cold Spring Harbour Perspective in Medicine*, 8 (9), a030387.
- Shaw, E.K., Scott, J.G. & Ferrante, J.M. (2013). The Influence of Family Ties on Men's Prostate Cancer Screening, Biopsy, and Treatment Decisions. *American Journal of Men's Health* 7(6) 461 –471, DOI: 10.1177/1557988313480226
- Sung, H., Ferlay, J., Siegel, R. L., Laversanne, M., Soerjomataram, I., Jemal, A., & Bray, F. (2021). Global cancer statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA. A Cancer Journal for Clinicians*, 71(3), 209-249.
- Windhoek Declaration. (2022). *Windhoek Declaration on Prostate Cancer*. Ministry of Health and Social Services, Namibia.
- World Health Organization (WHO) / International Agency for Research on Cancer (IARC). (2021). *Cancer fact sheet*. Geneva: WHO.