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Barriers to accessing cancer care services in Eastern Cape and Mpumalanga provinces of South Africa: cancer survivors' perspectives

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Abstract

Background The World Health Organization's 2022 estimates reported 20 million new cancer cases and 9.7 million deaths, reaffirming cancer as the second leading global cause of mortality. Equitable care requires access to prevention, early detection, treatment, and follow-up for all populations. In rural South Africa, access is shaped by structural, economic, systemic, and sociocultural factors. This study explored cancer survivors' experiences in the Eastern Cape and Mpumalanga to understand the barriers they face in obtaining care.

Methods A qualitative study was conducted between November 2021 and January 2022 using semi-structured interviews with adult cancer survivors receiving care at tertiary referral hospitals in the rural Eastern Cape and Mpumalanga provinces of South Africa. Purposive and convenience sampling were used to recruit participants aged 18 years and older who could provide informed consent and describe their care experiences. Interviews explored diagnostic pathways, comorbidities, and barriers to accessing cancer services. Data were analysed inductively using Braun and Clarke's thematic analysis, with emergent themes subsequently interpreted using the World Health Organization health system building blocks framework.

Results The study included 33 cancer patients aged 30–74 years attending oncology clinics. Most participants were women ($n = 25$) and unemployed ($n = 23$). Breast cancer was the most common diagnosis ($n = 14$), followed by cervical cancer ($n = 9$), with smaller numbers of prostate, thyroid, stomach and Kaposi's sarcoma cases. Breast and cervical cancers accounted for over two-thirds of all diagnoses. Four themes that emerged were poor infrastructure, financial barriers, environmental and contextual challenges, and health system obstacles, illustrating the multidimensional barriers to rural cancer care.

Conclusion This study identifies structural, economic, and social barriers limiting cancer survivors' access to care in rural South Africa, causing diagnostic delays, treatment interruptions, and increased vulnerability. Participant narratives reveal critical gaps in the health system and highlight the need for culturally grounded, community-responsive reforms. Enhancing access requires decentralised oncology services, strengthened referral pathways, transport and education support, and integrated psychosocial care. Coordinated efforts among policymakers,

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providers, and communities, informed by comparative rural–urban research, are essential to achieve equitable cancer care.

Keywords Cancer survivors, Cancer care access, Barriers, Care pathways, South africa

Introduction

The latest estimates of the global burden of cancer released by the World Health Organization (WHO) in 2022 showed 20 million new cancer cases and 9.7 million deaths [1]. Cancer is the second leading cause of death globally [1]. Moodley and colleagues projected that by 2030, annual cancer cases will reach 24 million, with 17 million deaths [2]. This anticipated rise is primarily attributed to population growth and aging, with the greatest impact expected in low- and middle-income countries (LMICs) [2]. Estimates available on the International Agency for Research on Cancer IARC's Global Cancer Observatory show that 10 types of cancers collectively comprised around two-thirds of new cases and deaths globally in 2022 [1]. The IARC further reported that lung cancer was the most frequently diagnosed cancer in 2022 and the leading cause of cancer death, representing almost 2.5 million new cases worldwide (12.4% of all cancers globally), followed by female breast cancer (11.6%) and colorectum (9.6%) [1]. According to WHO projections, global cancer cases are expected to exceed 35 million by 2050, an alarming rise from approximately 20 million cases reported in 2022 [1]. The global cancer burden is escalating rapidly, making cancer prevention one of the most critical public health priorities of the 21st century [1].

Cancer is an increasingly significant health challenge in Africa, with rising mortality rates driven by high treatment costs and limited access to adequate healthcare facilities [3]. In sub-Saharan Africa (SSA), cancer is emerging as a major public health concern, where the age-standardised incidence and mortality rates are 128.2 and 87.2 per 100,000 people respectively [4]. If timely interventions are not implemented, projections indicate that annual cancer-related deaths could rise significantly from 520,348 in 2020 to approximately 1 million by 2030 [5]. Cancer is a growing health challenge in Africa, where limited access to care and high treatment costs are driving rising mortality rates, projected to exceed the global average by 30% within the next two decades [6]. In SSA, cancer has historically been a low priority within healthcare systems, largely due to the dominant burden of communicable diseases [5, 6]. Furthermore, the high cost of treatment and limited availability of diagnostic and care facilities have contributed to rising cancer mortality rates across the region [6]. High-income countries have effectively adopted patient navigation systems across the cancer care continuum, whereas such strategies are largely

absent in low-income countries, leading to gaps and inefficiencies in cancer care delivery [7].

Cancer has been given low priority within healthcare services in SSA [8]. In addition to this, several disparities in cancer diagnosis and screening between the different African regions contribute to the morbidity and mortality rates across regions. An estimation of eight million people in LMICs die from causes linked to ineffective healthcare, with five million of these deaths occurring among individuals who accessed the health system but received poor-quality care [9]. Studies undertaken in Africa revealed that ineffective and poor-quality health services are holding back progress in improving health in countries with low-income levels [10, 11]. Ineffective quality healthcare is predominantly occurring in poor rural communities due to the socio-economic status of those communities. Challenges such as limited healthcare knowledge in rural communities, inadequate access to care caused by shortages of resources and diagnostic equipment, and insufficiently trained staff contribute to delays in referrals to specialised services [12].

In South Africa, cancer incidence are projected to rise by 66% and mortality by 69% between 2020 and 2040, posing substantial socio-economic and health system challenges [2]. Populations residing in areas of persistent poverty tend to exhibit higher prevalence of established cancer risk factors, such as obesity, tobacco use, alcohol consumption, risks related to risky sexual practices and environmental risk factors, such as sun exposure and pollutants [13, 14]. Furthermore, prolonged exposure to social and economic disadvantage may contribute to accelerated epigenetic aging and heightened vulnerability to cancer.

Research has shown that cancer causes significant physical, emotional, and financial strain on patients, their families, the community, and the health system [15]. A shortage of medical doctors and other skilled professionals at district and community levels limits effective assessment, timely diagnosis, appropriate referral, and the delivery of treatment and care, thereby undermining cancer care and coordination [16]. The inadequate cancer care offered in public hospitals is a serious concern, as it reduces the quality of life in many underprivileged communities and significantly contributes to morbidity and mortality rates. A previous study by Tetteh and Faulkner (2016) similarly identified sociocultural barriers and weak health systems as key obstacles to accessing oncology services in LMICs [17], and further emphasised the need for health departments to prioritise cancer care

through dedicated budgeting and the delivery of comprehensive, practical services.

Ensuring equity in cancer care is crucial so that all individuals, regardless of socioeconomic status or geographic location, have equal access to cancer prevention, early detection, appropriate treatment, and follow-up care [3]. Access to cancer care in rural South Africa is shaped by a complex interplay of structural, economic, systemic, and sociocultural factors. There is a need for more context-specific, survivor-informed research to guide the development of inclusive health policies and cancer support programs. This study aims to fill this gap by exploring the lived experiences of rural cancer survivors. The disparity in cancer care outcomes in cancer survivors living in developing and developed countries provides the momentum for this paper to explore barriers to accessing cancer care in rural communities. Therefore, this paper aimed to explore barriers to accessing cancer care services in Eastern Cape and Mpumalanga provinces of South Africa.

Methods

Study design

A qualitative study was conducted using semi-structured, in-depth interviews with cancer survivors who sought treatment at referral hospitals located in two rural provinces of South Africa, Eastern Cape and Mpumalanga. These interviews were carried out from November 2021 to January 2022, with the aim of gaining a deeper understanding of patients' experiences, challenges, and care pathways within the cancer treatment system.

Study conceptual framework

While barriers to accessing cancer services have been widely documented across diverse settings, much of the

existing literature is framed through established health systems or service utilisation frameworks. This study adopted a primarily inductive qualitative approach in order to foreground participants' lived experiences and their navigation of two resource-constrained provincial health systems. At the same time, the analysis was guided by a health systems perspective, with the findings interpreted in relation to the World Health Organization (WHO) health system building blocks framework. This framework offers a structured way of understanding how key components of the health system including service delivery, the health workforce, financing, access to medicines and technologies, health information systems, and leadership and governance interact to shape access to cancer care [18]. By first allowing themes to emerge inductively and subsequently mapping them onto the WHO building blocks, the study both remains grounded in participants' narratives while also engaging with an established body of health systems theory (Fig. 1).

Study setting

The study was conducted across three health districts in South Africa; the Oliver Reginald (OR) Tambo District in the Eastern Cape Province, and the Ehlanzeni and Nkangala Districts in Mpumalanga Province. According to the 2024 mid-year population estimates, the Eastern Cape is home to approximately 7,176,230 people, making it the fourth most populous province in the country [19]. Notably, over 70% of residents in the eastern region of the Eastern Cape live in rural areas, which significantly impacts access to healthcare services. Mpumalanga province, with a population of around 5,057,662, ranks as the sixth most populous province and is considered the third most rural in South Africa, with 56% of its population residing in rural areas [19].

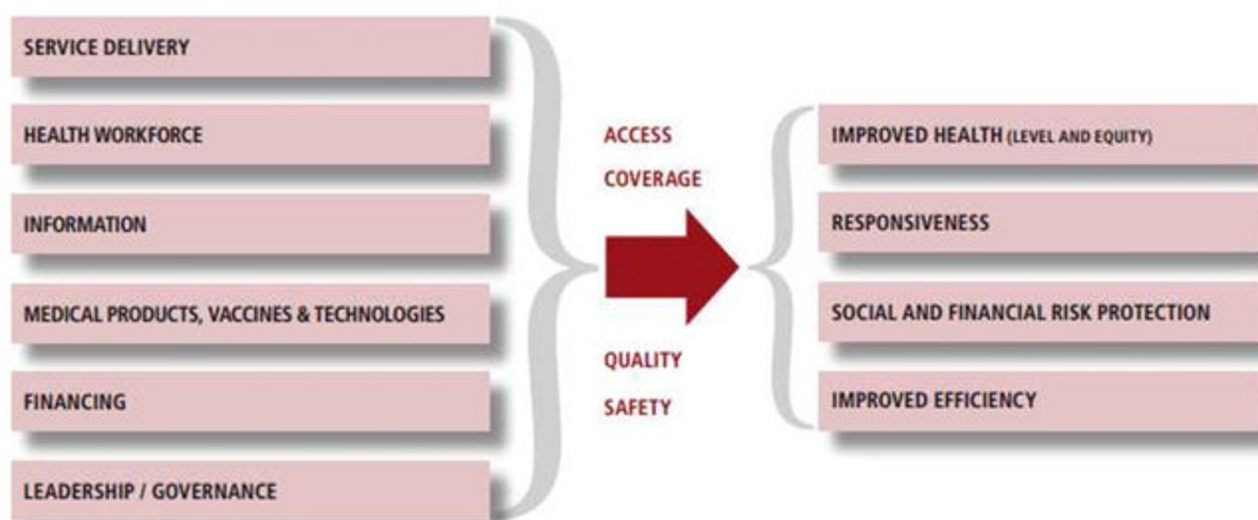


Fig. 1 The WHO health system building blocks framework (Source: WHO, 2007)

In the Eastern Cape, constraints in the health workforce, limited diagnostic and pathology services, and weak referral pathways contribute to prolonged delays in cancer diagnosis and treatment. Mpumalanga's health system also remains under strain, with limited local oncology capacity and continued reliance on referrals to Gauteng for specialised care. As a result, patients with financial means may seek treatment outside the province, while those dependent on the public sector experience delayed and fragmented care pathways. The referral hospitals included in this study reflect these system dynamics. Nelson Mandela Academic Hospital (NMAH) in the Eastern Cape functions as a quaternary (Central) and academic referral centre but serves a large, socioeconomically disadvantaged population and operates under substantial infrastructure and staffing pressures. Witbank Hospital in Nkangala District serves communities linked to the mining sector and is primarily oriented toward emergency and trauma care, with limited capacity for cancer-related services. Rob Ferreira Hospital in Ehlanzeni District has comparatively greater specialist capacity and referral reach; however, access to advanced oncology services remains constrained. These settings provide an important context for understanding how health system limitations and geographic inequality influence cancer care experiences in rural South Africa.

Participants and sampling

The study population consisted of adult cancer patients aged 18 years and older who were receiving treatment at three tertiary-level public hospitals in South Africa. These facilities included Nelson Mandela Academic Hospital in the Eastern Cape and, Rob Ferreira Hospital and Witbank Hospital in Mpumalanga. Participants were selected using purposive sampling to ensure relevance to the study objectives. A target of at least 10 participants per site was set to allow for meaningful comparison across the different geographic and institutional contexts. Recruitment was conducted on a convenience basis, with patients approached based on their availability, willingness to participate, and ability to engage in an interview without physical or emotional discomfort. Inclusion criteria emphasised the capacity to provide informed consent and communicate their experiences effectively. This sampling approach aimed to capture a diverse range of perspectives while ensuring ethical and practical feasibility in a clinical setting.

Data collection

Data collection took place between November 2021 and January 2022 through semi-structured interviews with patients receiving oncology care at Nelson Mandela Academic Hospital (NMAH), Witbank Hospital (WH), and Rob Ferreira Hospital (RFH). An information sheet

(Appendix A), clearly explaining the purpose of the study, along with a consent form (Appendix B), was provided to participants before the interviews. Interviews were conducted using open-ended questions, guided by an interview guide, with probing applied where necessary (Appendix C). The interview guide probed participants on cancer diagnosis they had, comorbid conditions and barriers to cancer care. This approach enabled participants to freely express themselves and provide detailed insights without restriction. Interviews were conducted in participants' preferred languages, primarily isiXhosa in the Eastern Cape and siSwati or isiZulu in Mpumalanga, and were translated into English for analysis. To maintain confidentiality, all interviews took place in designated areas within the hospitals. With participants' consent, interviews were audio-recorded, transcribed verbatim in the local languages (isiXhosa or siSwati), translated into English by an independent transcriber, and subsequently back-translated into the local language by another individual who was not involved in the initial transcription or translation. Any discrepancies identified were resolved to ensure that the English versions accurately reflected the original meaning. The final English transcripts were then used for coding and analysis. Reporting used the Consolidated Criteria for Reporting Qualitative Research (COREQ) (Appendix D).

Data management and analysis

The data were analysed using an inductive thematic analysis approach, aimed at providing a rich and nuanced understanding of the dataset while interpreting key dimensions of the research topic [20]. The analysis followed Braun and Clarke's (2006) six-step framework: familiarisation with the data, systematic coding, development of initial themes, reviewing themes, defining and naming themes, and synthesising and reporting findings [21]. An independent coder used ATLAS.ti version 2023 for coding. After discussion and agreement between the first author and the independent coder, consensus was reached, and the authors collaboratively proceeded with the analysis until themes emerged. A review meeting was held to refine and, where necessary, rename themes. Through this rigorous process, themes and subthemes were systematically developed, refined, and presented. Thematic saturation was observed after 29 interviews, when no substantially new themes were emerging, and a further four interviews were conducted to confirm the stability of the findings. All 33 interviews were included in the thematic analysis. The absence of diagnostic information in one interview did not affect theme development, and further coding yielded no new insights.

Ethical considerations

Ethical approval for this study was granted by the Human Research Ethics and Biosafety Committee of the Faculty of Health Sciences, Walter Sisulu University (reference: 040/2020), and the Human Research Ethics Committee of the University of the Witwatersrand (reference: M210211). Access to study sites was authorized by the Eastern Cape (reference: EC_202010_012) and Mpumalanga (reference: MP_202011_002) Provincial Health Research Committees. Prior to data collection, entry to the hospitals was arranged in consultation with hospital management. The study adhered to the International Conference on Harmonisation guidelines for Good Clinical Practice in research involving human participants in South Africa and observed the four core ethical principles of autonomy, beneficence, non-maleficence, and justice.

Reflexivity

This study was carried out by a multidisciplinary team of South African researchers. The lead author (NN), a Social Sciences scholar with a background in Psychology and a doctoral qualification, acknowledged that her professional training and experiences could shape her interpretation of the data. To minimise potential bias, the team ensured that participants from varied backgrounds were included and that their perspectives were carefully considered. For triangulation, transcripts were independently reviewed, and coding decisions were collectively discussed. Emerging themes were further examined

Table 1 Sociodemographic characteristics of patients with cancer attending tertiary oncology clinics in the Eastern Cape and Mpumalanga provinces, South Africa

	Total (n = 33)	Men (n = 7)	Women (n = 26)
Age (years)			
30–39	5	2	3
40–49	10	0	10
50–59	8	0	8
60–69	5	1	4
>70	3	3	0
Not stated	2	1	1
Marital status			
Single/Never married	18	2	16
Married	12	4	8
Widowed	2	0	2
Not stated	1	1	0
Employment status			
Unemployed	24	5	19
Employed	5	0	5
Self-employed	1	0	1
Retired	3	2	1
Locality type			
Urban	9	3	6
Rural	24	4	20

through dialogues between NN and SAM, with any differences debated and resolved. These strategies were implemented to ensure that the lead author's perspective did not unduly influence the overall interpretation of the findings.

Results

Sociodemographic characteristics

Table 1 presents sociodemographic characteristics of the study participants. The study included 33 patients living with cancer attending specialised oncology clinics in the Eastern Cape and Mpumalanga provinces, with age ranging from 30 to 74 years. The majority of the participants were women ($n = 26$) and unemployed ($n = 23$). Most participants were between 40 and 59 years of age, with men more represented in the older age categories (> 70 years) while women were concentrated in midlife (40–59 years). More than half (57.6%) were single or never married, just over a third were married, and only a few were widowed. Men were more likely to be retired, while women were more often unemployed. Most patients (72.7%) resided in rural areas, with women again more affected, highlighting the intersection of gender, socioeconomic status, and rural locality in shaping the experiences of patients with cancer in these provinces.

Cancer types and other diagnosed chronic diseases

Figure 2 presents the distribution of cancer cases by type and hospital across the three hospitals. Among the 33 participants interviewed, cancer type information was available for 32 participants, as one participant from Witbank Hospital did not report a specific cancer diagnosis at the time of the interview. Breast cancer was the most common type of cancer ($n = 14$), followed by cervical cancer ($n = 9$), with smaller numbers of prostate ($n = 3$), thyroid ($n = 3$), stomach ($n = 2$), and Kaposi's sarcoma (KS) ($n = 1$) cases. Breast and cervical cancers together accounted for over two-thirds of all cancer cases, with cervical cancer occurring exclusively at NMAH, while breast cancer cases were distributed across all three hospitals.

Figure 3 presents the distribution of cancer cases with other diagnosed chronic conditions that participants had across the three hospitals. In terms of chronic comorbidities, 25 patients reported at least one condition, with HIV being the most frequently reported ($n = 14$), followed by hypertension ($n = 8$), arthritis ($n = 2$), and diabetes ($n = 1$). The burden of HIV was observed across all three sites, while hypertension was more prominent at NMAH. Overall, the data highlight the predominance of breast and cervical cancers in women, alongside a considerable overlap of HIV and other chronic conditions within the patient population.

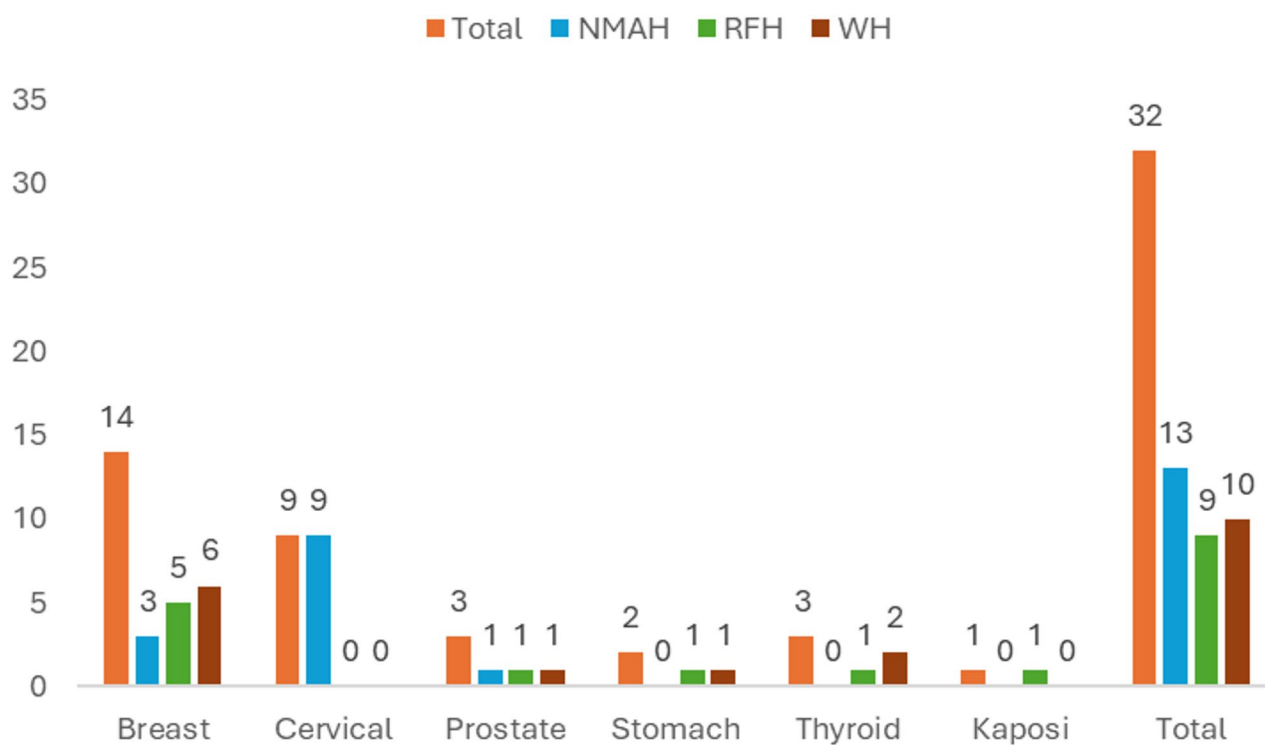


Fig. 2 Distribution of cancer cases by type and hospital

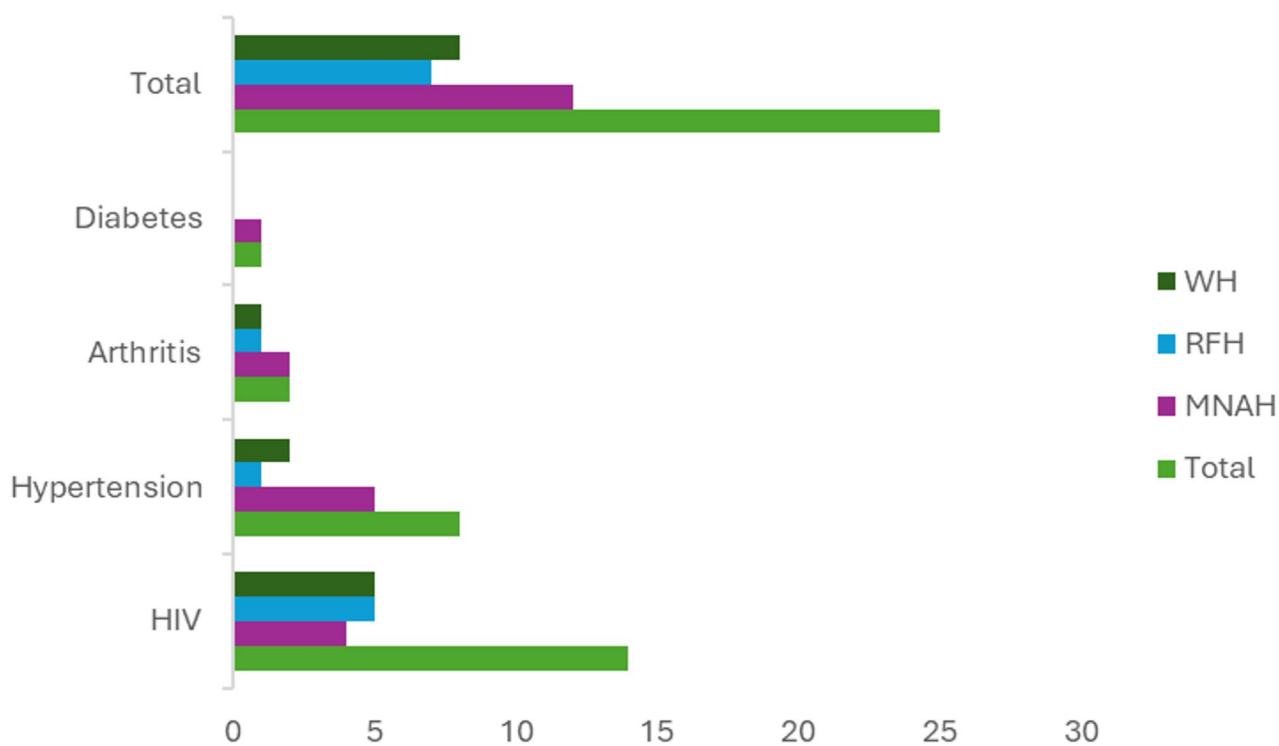


Fig. 3 Distribution of cancer cases with other chronic diseases

Theme 1: poor infrastructure

Both the Eastern Cape and Mpumalanga provinces are predominantly rural provinces, and this rural context significantly shaped participants' experiences of accessing cancer care. Many participants described multiple infrastructure-related challenges that created barriers to timely and equitable healthcare. Poor road conditions were frequently mentioned, with some noting that long and unsafe journeys discouraged regular follow-up visits. Participants also highlighted the limited number of healthcare facilities within reasonable distance, which often left them with no choice but to travel long hours to reach tertiary hospitals after referral from primary healthcare facilities.

Subtheme 1: bad road conditions

Participants frequently spoke about the poor state of road infrastructure, describing how bad road conditions created significant barriers to reaching health facilities. Participants further explained that these poor road conditions not only affected their own travel but also contributed to ambulances taking much longer to reach them or transport them to hospitals, often worsening delays in accessing critical care.

"...Our hospital had no tar road (sic), they are starting to develop it. The doctors and ambulances are struggling. When we call the ambulance, it takes forever to get to us..." H1P2.

"...When the ambulance is about to leave when it is full, they say all those that are just accompanying patients must get off, mind you some of these patients need to be accompanied..." H1P3.

Subtheme 2: distance challenges to access care

The challenges of accessing cancer care disproportionately affected underserved populations, particularly those living in remote or rural areas. Participants described having to travel long distances, sometimes more than 200 km from Mthatha to East London to reach treatment centres. This extensive travel not only imposed significant financial and physical burdens but also intensified the emotional stress associated with managing a serious illness.

"...When I am going to East London there is a bus that we use. I come and sleep this side, then at 3 am we wake up and travel. Even when we are coming back, I sleep here then go home..." H1P6.

Participants travelled for more than a day to get to the main referral hospital back to their homes.

"...I used to travel on my own from home to Madwaleni, and then from there we travel (sic) by ambulance to Mandela [Nelson Mandela Academic Hospital – a rural quaternary hospital which serves as an intermediary hospital for referral of patients for specialised cancer care]. In (sic) Mandela [Nelson Mandela Academic Hospital], we usually arrive around 1 am, the ambulance will take us around 12am or 11pm, then we sleep on the chairs..." H1P7.

"...imagine leaving home at 05:00 am as today I arrive at 09:00 am. When I arrive they made some delays and we can't control the delays at the hospitals because there are many people (sic)... 5 hours I will arrive home at about....the first time I arrived home at half past 11, the second time I arrive home at 10 (sic)..." H3P4.

Theme 2: financial barriers

Some of the financial challenges that were often reported by the participants include transportation money to go to the hospital. For most participants, they stayed quite far from the hospital and needed to catch taxis and buses.

Subtheme 1: transport cost to health facilities

"...I travel by taxi, sometimes when I do not have money, I go to loan sharks and borrow from them, when I want to collect my medication..." H1P8.

"...It is difficult because at times we borrowed the money for travelling and we cannot return it because it is already used..." H1P9.

"...Hey (sic) I try to get money for the transport to get here. Eish it's hard. To put the money together is difficult..." H2P3 "...Hey (sic) I try to get money for the transport to get here. Eish it's hard. To put the money tog

Subtheme 2: cost of medication and treatment

While some mentioned the difficulty of having to borrow transport money to get to the hospital for care, others shared their frustrations of using their own money to buy medication, which is free in the public health sector.

"...It's painful when I run out of medication because I have to buy it..." H2P1.

"...I'm spending to add on top of those they gave me, when they are not here then still I have to buy them (sic). The pills are 36 something in the box (sic). They last for a month..." H3P4.

Subtheme 3: recurrent hospital fees

Other participants explained the painful experience of paying fees each time they went to the hospital. They could not understand why they had to pay in a public/government hospital, where services were supposed to be for free.

"...every time when you come here, you have to pay R75 [~4.3 USD] to open a file, because I can see people are still paying money, and that it does not sit well with me (sic), to pay money..." H3P6.

"...I have to go to hospital, I don't have R50 [~2.9 USD] to pay for the file and if they send me back what must I do? There is nowhere I can go to without getting help from the hospital..." H3.

"...I have to stay at home because I don't have R50 [~2.9USD] to open a file, if you don't pay, you are told you owe them, next time when you come back you have to pay R100 [~5.7 USD] ...You see that you will be afraid to go to hospital, and you choose to stay at home until you die because of R50 [~2.9 USD] for a file..." H3.

Theme 3: environmental and contextual factors

Cancer survivors often face various challenges that negatively affect their wellbeing, with some of these challenges stemming from people within their own communities. Survivors reported experiencing stigma, lack of understanding, and unsupportive attitudes from neighbours, friends, or even family members. These social pressures can contribute to feelings of isolation, emotional distress, and difficulty reintegrating into daily life, further complicating their recovery and overall quality of life.

Subtheme 1: perceptions and (lack of) cancer knowledge

Participants expressed varying perceptions about cancer, with some holding misconceptions about its causes and treatment. A general lack of knowledge contributed to fear, stigma, and delayed health-seeking behaviours. Limited awareness also meant that preventive measures and early detection were often overlooked.

"...In our villages we fear this burning, we wonder what kind of treatment that is. It is scary, I did not know that this is a high standard treatment that is helpful to me..." H1P10.

"...Sir, in the villages people who have cancer are struggling, we were educated that cancer is not infectious, but they are still scared that we will infect them, but we are surviving regardless..." H1P11.

"I heard rumours that if you remove your womb, you will be free from cancer. But the doctor said, 'we are not going to operate on you, we will treat your cancer with radiation' H1P12.

Subtheme 2: stigma and stereotypes about cancer

Participants reported that environmental and contextual factors in their communities negatively influenced their experiences, particularly through stigma and misconceptions. They described how they were treated by their neighbours and other people in their communities after they found out that they had cancer. Some mentioned that there is stigma and discrimination attached to cancer, and that cancer survivors endure ill-treatment.

...it was only my male neighbour. He was swearing at me saying I have one breast..." H1P5.

"...Sir, cancer is an unbearable condition, it's a stigmatised condition. I do not feel good when they say in Xhosa that I have umhlaza (cancer disorder), I prefer the word 'cancer...' H1P12.

"...in my village people are gossiping about you when you are coming to meet them, sometimes they even ask you 'where is the location of your cancer'? In East London [city where specialised referral cancer care services are], we were told to talk about it, we were told to embrace it so that people can change their attitude..." H1P12.

"...it is not easy, when you tell them that you have cervical cancer, they think that it is the end of your life, and will they ask you where you got it..." H1P13.

"...We are still being discriminated against in our villages; the worst part is being discriminated against by your partner. He will say: 'I am worried, I am not even sure if you did not infect me with this thing'. I tell him that cancer is not infectious, but he still does not believe me..." H1P13.

Other challenges included community members who made life difficult for survivors by failing to understand the pain and burden of living with a life-threatening illness.

"...people will then say you doing that because you don't have a breast, we wish that they should have cut the other one... They make me feel like fighting because those things don't sit well with me. And I did not ask for what happened to me..." H3P2.

"...The worst thing is that it's not men who tell me this thing, its other woman... And I even tell them that this thing is so painful because I did not ask for it. So, its challenges like this one that I come across in fact (sic)..." H3P4.

Theme 4: health system barriers

The study participants expressed their concerns regarding poor service delivery in the hospitals. They highlighted numerous issues that make it difficult for them to access cancer care and these included poor service

delivery, poor referral pathways, long patient waiting times and shortage of medication.

Subtheme 1: poor service in hospitals

Some form of inconvenience to patients was reported, which somehow made life difficult for them to access services at the hospital. Participants mentioned that they would sometimes go to the hospital but not see a doctor. This added more financial strain to them as they would need to go back to the hospital. Sometimes patients even deliberately ignore the referral pathways by self-referring themselves to a secondary hospital due to not being satisfied with services in the primary/district hospitals which are meant to be the ones deciding on whether the patient needs a referral or not.

"...I left Tintswalo [a district hospital in Mpumalanga province] to Mapulaneng [a secondary/level 2 hospital in Mpumalanga province] because of their service that makes me angry....often when you go there on Tuesday which is our clinic day, they will tell you that your doctor is not here; there is nothing that we can do for you..." H2P3.

Poor referral pathways in healthcare services also discouraged participants to access care. Some reported experiencing delays or being sent from one facility to another without clear guidance, which created confusion and frustration.

...the week before last, on the 11th I came, when I arrived here at Bernice [Bernice Samuel District Hospital], those who transferred me here didn't give all the information about what I was going to do here [Witbank Tertiary Hospital in the Mpumalanga province]. So, they sent me back and gave me another date to come for services....H3

Subtheme 2: long waiting times in hospital

Long waiting times in hospitals were reported as a major challenge for patients, causing frustration and sometimes discouraging them from seeking care. Extended delays not only disrupted patients' daily lives but also contributed to increased stress and, in some cases, worsened health outcomes due to postponed treatment.

"...if we want files since this side we must come with the file. We queue there and here as while which is queuing twice. We take a long time at the files department like today I was here by 7 o'clock but I only got my file at 10:30 [am]..." H2P2.

"...Ngodini [Themba Regional Hospital in Mpumalanga province. This is the hospital which referred them to the interview site for chemotherapy] is far

behind, like you will arrive in the morning and go back in the evening around 6pm. It takes a very long time for you to see a doctor. So, if they can improve on that..." H2P3.

Subtheme 3: shortage of medication

A shortage of medication in hospitals was reported as a significant barrier to effective treatment. This lack of availability not only increased financial burdens, but also delayed proper treatment and compromised their health outcomes.

"...Our wish... is that the government can support us with medication and tablets for pains. The hospital is still struggling, they do not have enough equipment. East London [Frere Tertiary Hospital- a city hospital with specialised cancer care] is far better than this hospital [Nelson Mandela Academic Hospital]..." H1P2.

"...Ahh nothing but I have a complain about the pills, the pills are not available in this hospital..." [this was Witbank hospital in Mpumalanga province] H3P7.

Subtheme 4: shortage of beds in hospitals

Beyond the challenges posed by poor road infrastructure, participants also reported a shortage of hospital beds. They described having to sleep on floors or sit on hospital benches overnight while waiting to be attended to by doctors the following morning.

One participant even expressed that despite financial challenges, they still made means to travel to the district hospital that's closest to their home. However, financial challenges and out of pocket costs to get to hospital were not the only challenges.

"In our hospitals when we are waiting for the doctor we sleep on the floor because they do not have beds, sleeping on the chair is very uncomfortable..." H1P1.

"Yes, we sleep in the hospital, then if we came back in early hours, maybe around 3am, we go and sleep in Canzibe [a district hospital closest to their home]. It is very uncomfortable to sleep there. We sleep on the chairs, there is no arranged place.... This happens everywhere, even in East London [city where referral hospital, with radiotherapy, chemotherapy and other cancer care services are], people were complaining..." H1P8.

Discussion

This study sheds light on the barriers to accessing cancer care services in the Eastern Cape and Mpumalanga provinces of South Africa, drawing on the lived experiences and perspectives of cancer survivors. Inadequate

healthcare infrastructure was found to limit access to quality services, with participants reporting issues such as poorly equipped facilities and unreliable utilities. Financial constraints further compounded these challenges, as out-of-pocket costs, transportation expenses, and income loss created significant economic burdens for cancer survivors and their families. In addition, systemic issues within the health system such as staff shortages, weak referral mechanisms, long waiting times, and inconsistent medication availability further hindered the effective delivery of care. Lastly, environmental and contextual influences, including geographical location, social support, and community attitudes, were shown to play a crucial role in shaping participants' experiences and access to healthcare services.

Poor road infrastructure and limited availability of ambulances were significant barriers to timely access to cancer care. Participants described delays in ambulance response due to unpaved roads, the need to offload accompanying caregivers when ambulances were full, and extended travel times to reach tertiary hospitals. These delays not only jeopardise patient safety but also hinder effective service delivery, a core component of the World Health Organization's health system building blocks. Health workforce efficiency is compromised when clinicians receive patients late or under suboptimal conditions, limiting the capacity to provide timely and patient-centred care [22, 23]. Moreover, the shortage of healthcare facilities and hospital beds further constrained access to care. Our findings showed participants sleeping on floors or hospital benches while waiting for appointments, highlighting the inadequacy of physical infrastructure to meet patient demand. Similar findings were reported by Malematja and colleagues, who noted the impact of insufficient resources on the quality of service [24]. Adequate infrastructure, equipment, and medical products are essential for a functional health system.

Accessing care in distant hospitals placed significant financial and logistical burdens on cancer survivors. Traveling long distances from rural areas increased transport costs and often required overnight stays, something previously reported by Chitha et al. (2022) [25]. Inadequate transport infrastructure disproportionately affects underserved populations, revealing inequities in health financing and access, as people in rural areas face multiple challenges in obtaining appropriate health services [26, 27]. These findings are consistent with previous studies highlighting transport costs as a key barrier to continued cancer care, especially in low-resource settings where treatment facilities are largely concentrated in urban areas [28, 29]. Further inequities are exacerbated by structural issues where a quaternary level hospital refers patients to a tertiary hospital for cancer care, only because the quaternary level hospital is in a rural area

and the tertiary hospital is in a city. This aspect has also been previously reported in literature [25, 30].

Participants also expressed frustration about paying administrative fees and the costs of repeated hospital visits, reflecting weaknesses in health financing systems. The World Health Organization (2010) emphasises that equitable financing is essential to reduce financial barriers to care. Out-of-pocket expenses further strain cancer survivors and their families, often leading to treatment delays, particularly for those living far from health facilities [31]. These challenges point to broader governance and planning gaps, underscoring the need for strong leadership to ensure equitable distribution of healthcare facilities, adequate ambulance services, and improved road infrastructure.

In addition to transportation expenses, participants expressed frustration over the need to purchase medication when supplies at public hospitals were unavailable, as well as the imposition of administrative fees for opening patient files. These out-of-pocket expenses, though seemingly small, represented a substantial burden for individuals already facing income loss due to illness. The perception that essential services at public facilities were not fully free further deepened participants' sense of financial strain and health system distrust. Previous studies have highlighted that such indirect costs can discourage timely follow-up and result in treatment interruptions, negatively affecting patient outcomes [32, 33]. These findings underscore the need for policies that address the hidden costs of cancer care and ensure equitable access, particularly for low-income patients residing in remote areas.

The study highlights that environmental and contextual factors, particularly community perceptions and misconceptions, significantly shaped the experiences of cancer survivors. Participants reported widespread misinformation about cancer and its treatment, including fears surrounding radiation therapy and ill-treatment from community members. Such findings are consistent with prior research indicating that low cancer literacy and pervasive myths can heighten fear, reinforce stigma, and contribute to delayed care-seeking or poor treatment adherence [34, 35]. The persistence of these misconceptions points to an urgent need for targeted health education initiatives that are culturally and linguistically appropriate. Community-level interventions should aim to clarify cancer treatments, challenge harmful beliefs, and foster supportive social environments for survivors.

Stigma emerged as a pervasive barrier to psychosocial well-being, with participants describing experiences of discrimination, offensive comments, and social exclusion from neighbours. Such stigma was often reinforced through language, with terms like *umhlaza* (Xhosa for cancer) carrying negative connotations that exacerbated

survivors' emotional distress. These findings align with previous studies showing that stigma surrounding cancer can lead to social withdrawal, poor mental health outcomes, and diminished quality of life [36, 37]. Moreover, the observation that stigmatizing remarks were commonly encountered highlights how entrenched social perceptions of illness and body image warrant specific attention in community-based interventions. Addressing stigma through public awareness campaigns, survivor-led advocacy, and psychosocial support programmes may help mitigate these negative experiences and facilitate reintegration into social networks.

Poor service delivery was reported, including repeated visits without receiving care, which significantly disrupted access to cancer treatment. Inefficiencies in hospital services, such as long waiting times and multiple queues for files, reflect gaps in service organisation and directly contribute to patient frustration, financial strain, and treatment delays [38]. Moreover, shortages of essential medications were frequently reported, forcing patients to either purchase drugs privately or delay treatment. The burden of paying out-of-pocket for medical care is a consequence of inequitable health financing structures and insufficient coverage for vulnerable populations. Ensuring the uninterrupted availability of essential medicines is a fundamental human right, as it is critical for effective disease management and prevention, and improving well-being [39]. Stock-outs highlight weaknesses in supply chain management and undermine patient trust in the health system. The absence of medical personnel and inadequate referral coordination highlighted weaknesses in the health workforce. The WHO emphasises that a well-functioning health system requires a sufficient, competent, and equitably distributed workforce [40]. Staffing shortages and poorly coordinated referrals not only extend waiting times but also compromise continuity of care, resulting in suboptimal outcomes for cancer survivors.

Implications for cancer care in HIV-prevalent settings

Although Kaposi sarcoma (KS) was not a specific focus of this study, it remains a relevant HIV-associated malignancy in high-burden settings. Whilst only one case of KS was interviewed, it is important to note that Kaposi sarcoma is a tumor that often shows significant regression with effective HIV viral suppression and appropriate chemotherapy [41]. Evidence suggests that effective HIV viral suppression achieved through early initiation of antiretroviral therapy (ART), with the addition of chemotherapy where clinically indicated, is associated with regression of KS lesions and a reduced risk of disease development [41, 42]. The expanded early rollout of ART has contributed to declines in KS incidence by preventing advanced immune suppression that facilitates disease

progression [43]. These observations provide important contextual insight into the broader implications of the health system barriers identified in this study, particularly delays in diagnosis, treatment initiation, and access to specialised oncology services in resource-constrained settings.

This study has several limitations that should be considered when interpreting the findings. As a qualitative study, the results are not intended to be statistically generalisable but rather to provide contextualised insights into patient-reported barriers to cancer care. Barriers to diagnosis and treatment may vary according to cancer type, stage, and treatment modality. However, participants were recruited without stratification by cancer diagnosis, and the study did not seek to compare experiences across different cancer types. In addition, most participants were receiving chemotherapy at the time of data collection, and their experiences may differ from those of patients undergoing radiotherapy or other forms of cancer treatment. Despite these limitations, the study provides a valuable baseline understanding of key barriers encountered by cancer patients within this setting, which may inform future disease-specific or modality-focused studies and guide efforts to improve access to cancer care.

Conclusion and recommendations

This study highlights the complex and multifaceted barriers cancer survivors face in accessing care in rural South Africa. It revealed persistent structural, economic, environmental, and social difficulties that contribute to inequities in cancer care. These challenges not only placed financial and physical strain on patients and their families but also contributed to delays in diagnosis, interruptions in treatment, and increased feelings of isolation and vulnerability among those seeking care. The voices of survivors offer critical insights into gaps often overlooked, highlighting the need for community-responsive and culturally sensitive health system reforms. Access to cancer care should be addressed holistically, not just as a medical issue, but as one shaped by broader social determinants. Decentralising cancer services by establishing oncology units at district hospitals, developing rural cancer care guidelines, providing transport assistance, enhancing patient education, and strengthening local referral systems to ensure continuity of care are key to improving access. Integrating psychosocial services, such as counselling and peer support, is essential to support survivors' mental and emotional well-being. Expanding public-private partnerships can also help improve infrastructure and service delivery in underserved areas. Future research should compare rural and urban cancer care to better understand disparities, and evaluate interventions designed with survivor input to

improve access and outcomes. Bridging the rural cancer care gap requires a collaborative approach involving policymakers, healthcare providers, communities, and survivors. Studies of this nature are vital in building a just and inclusive health system.

Supplementary Information

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Supplementary Material 1.

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Authors' contributions

SAM and WWC contributed to the study's conception. OM carried out data collection, data checking, and data entry. NK contributed to data entry, verification and analysis. NN contributed to data analysis and interpretation, conceived the article, and drafted the manuscript. All authors reviewed the manuscript and provided critical feedback and revisions that were incorporated into the final version. NN accepts full responsibility for the work and the conduct of the study, has full access to the data, and holds the final decision on publication.

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Data availability

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate

Ethical approval for this study was obtained from the Human Research Ethics and Biosafety Committee of the Faculty of Health Sciences, Walter Sisulu University (reference: 040/2020), and the Human Research Ethics Committee of the University of the Witwatersrand (reference: M210211). Access to study sites was authorized by the Eastern Cape (reference: EC_202010_012) and Mpumalanga (reference: MP_202011_002) Provincial Health Research Committees. The research was conducted in accordance with the ethical principles of the Declaration of Helsinki, including respect for persons, beneficence, non-maleficence, and justice. Written informed consent was obtained from all participants, and additional consent was secured for audio recording of interviews before commencement.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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References

1. World Health Organization. Global cancer burden growing, amidst mounting need for services. Geneva: WHO; 2024.
2. Moodley J, Day S, Ras T, Govender A, Chekwote H, Moosa F, et al. Mapping local evidence on early recognition and management of people with potential cancer symptoms: a narrative review. *BMJ Open*. 2023;13(5):e065353. <https://doi.org/10.1136/bmjopen-2022-065353>.
3. Omotoso O, Teibo JO, Atiba FA, Oladimeji T, Paimo OK, Ataya FS, et al. Addressing cancer care inequities in sub-Saharan africa: current challenges and proposed solutions. *Int J Equity Health*. 2023;22(1):189. <https://doi.org/10.1186/s12939-023-01962-y>.
4. Bray F, Parkin DM, African Cancer Registry Network. Cancer in sub-Saharan Africa in 2020: a review of current estimates of the National burden, data gaps, and future needs. *Lancet Oncol*. 2022;23(6):719–28. [https://doi.org/10.1016/S1470-2045\(22\)00270-4](https://doi.org/10.1016/S1470-2045(22)00270-4).
5. Ngwa W, Addai BW, Adewole I, Ainsworth V, Alaro J, Alatise OI, et al. Cancer in sub-Saharan africa: a lancet oncology commission. *Lancet Oncol*. 2022 May;23(6):e251–312. [https://doi.org/10.1016/S1470-2045\(21\)00720-8](https://doi.org/10.1016/S1470-2045(21)00720-8). 9 [Epub ahead of print].
6. Chen Z, Xu L, Shi W, Zeng F, Zhuo R, Hao X, et al. Trends of female and male breast cancer incidence at the global, regional, and National levels, 1990–2017. *Breast Cancer Res Treat*. 2020;180(2):481–90.
7. Dalton M, Holzman E, Erwin E, Michelen S, Rositch AF, Kumar S, et al. Patient navigation services for cancer care in low-and middle-income countries: a scoping review. *PLoS ONE*. 2019;14(10):e0223537.
8. Hamdi Y, Abdeljaoued-Tej I, Zatchi AA, Abdelhak S, Boubaker S, Brown JS, et al. Cancer in africa: the untold story. *Front Oncol*. 2021;11:650117.
9. Kruk ME, Gage AD, Joseph NT, Danaei G, García-Saisó S, Salomon JA. Mortality due to low-quality health systems in the universal health coverage era: a systematic analysis of amenable deaths in 137 countries. *Lancet*. 2018;392:2203–12. [https://doi.org/10.1016/S0140-6736\(18\)31668-4](https://doi.org/10.1016/S0140-6736(18)31668-4).
10. World Health Organization (WHO). WHO report finds poor delivery of services threatens gains made in health in Africa. Brazzaville: WHO Regional Office for Africa; 2018. Accessed 19 Aug 2025.
11. Oleribe OO, Momoh J, Uzochukwu BS, Mbofana F, Adebijoyi A, Barbera T, et al. Identifying key challenges facing healthcare systems in Africa and potential solutions. *Int J Gen Med*. 2019;12:395–403. <https://doi.org/10.2147/IJGM.S223882>.
12. Lombe DC, Mwamba M, Msadabwe S, Bond V, Simwinga M, Ssemata AS, et al. Delays in seeking, reaching and access to quality cancer care in sub-Saharan africa: a systematic review. *BMJ Open*. 2023;13(4):e067715. <https://doi.org/10.1136/bmjopen-2022-067715>.
13. Moss JL, Pinto CN, Srinivasan S, Cronin KA, Croyle RT. Persistent poverty and cancer mortality rates: an analysis of county-level poverty designations. *Cancer Epidemiol Biomarkers Prev*. 2020;29(10):1949–54. <https://doi.org/10.1158/1055-9965>.
14. Jeleff M, Haider S, Schiffler T, Gil-Salmerón A, Yang L, Barreto Schuch F, et al. Cancer risk factors and access to cancer prevention services for people experiencing homelessness: a scoping review. *Lancet Public Health*. 2024;9(2):e128–46.
15. Fereidouni Z, Dehghan Abnavi S, Ghanbari Z, Gashmard R, Zarepour F, Khalili Samani N, et al. The impact of cancer on mental health and the importance of supportive services. *Galen Med J*. 2024;13:e3327. <https://doi.org/10.31661/gmj.v13i3327>.
16. Ramutumbu NJ, Ramathuba DU, Maputle MS. Barriers to accessing oncology services for effective cancer care in the public health institutions in Limpopo Province, South africa: a qualitative study. *Nurs Rep*. 2023;13(3):956–68.
17. Tetteh DA, Faulkner SL. Sociocultural factors and breast cancer in sub-Saharan africa: implications for diagnosis and management. *Womens Health (Lond)*. 2016;12(1):147–56. <https://doi.org/10.2217/whe.15.76>.

18. World Health Organization. Everybody's business: strengthening health systems to improve health outcomes – WHO's framework for action. Geneva: World Health Organization; 2007.
19. Statistics South Africa (Stats SA). Mid-year population estimates 2024: statistical release P0302. Pretoria: Stats SA. 2024 Jul 30. Available from: <http://www.statssa.gov.za>
20. Rosairo HSR. Thematic analysis in qualitative research. *J Agric Sci*. 2023;18(3):1–5.
21. Braun V, Clarke V. Using thematic analysis in psychology. *Qual Res Psychol*. 2006;3(2):77–101.
22. World Health Organization Regional Office for Africa. Technical efficiency of health systems in the African region. Brazzaville: WHO Regional Office for Africa; 2021.
23. Kaimba S, Umar E. Factors associated with delayed referrals of patients with sepsis from primary to tertiary healthcare in Blantyre, malawi: a qualitative study. *BMC Prim Care*. 2025;26(1):13. <https://doi.org/10.1186/s12875-025-02708-1>.
24. Malematja DN, Nkosi EM, Nene SE. The impact of insufficient resources on the quality-of-service delivery at a primary healthcare clinic in Limpopo. *Curationis*. 2025;48(1):e1–7. <https://doi.org/10.4102/curationis.v48i1.2696>.
25. Chitha W, Jafta Z, Mnyaka OR, Hongoro D, Godlimpi L, Swartbooi B, et al. Protocol of mixed-methods assessment of demographic, epidemiological and clinical profile of decentralised patients with cancer at Nelson Mandela academic hospital and Rob Ferreira hospital, South Africa. *BMJ Open*. 2022;12(4):e054983. <https://doi.org/10.1136/bmjopen-2021-054983>.
26. Vergunst R, Swartz L, Hem KG, Eide AH, Mannan H, MacLachlan M, et al. Access to health care for persons with disabilities in rural South Africa. *BMC Health Serv Res*. 2017;17(1):741. <https://doi.org/10.1186/s12913-017-2674-5>.
27. Coombs NC, Campbell DG, Caringi J. A qualitative study of rural healthcare providers' views of social, cultural, and programmatic barriers to healthcare access. *BMC Health Serv Res*. 2022;22(1):438. <https://doi.org/10.1186/s12913-022-07829-2>.
28. Sharma A, Alatisie OI, O'Connell K, Ogunleye SG, Aderounmu AA, Samson ML, Wuraola F, et al. Healthcare utilisation, cancer screening and potential barriers to accessing cancer care in rural South West nigeria: a cross-sectional study. *BMJ Open*. 2021;11(7):e040352. <https://doi.org/10.1136/bmjopen-2020-040352>.
29. Mwaka AD, Walter FM, Scott SE, Harries J, Wabinga H, Moodley J. Symptom appraisal, help-seeking and perceived barriers to healthcare seeking in uganda: an exploratory study among women with potential symptoms of breast and cervical cancer. *BMJ Open*. 2021;11(2):e041365. <https://doi.org/10.1136/bmjopen-2020-041365>.
30. Chitha W, Swartbooi B, Jafta Z, Funani I, Maake K, Hongoro D, et al. Model of delivery of cancer care in South africa's Eastern cape and Mpumalanga provinces: a situational analysis protocol. *BMJ Open*. 2022;12(2):e058377. <http://doi.org/10.1136/bmjopen-2021-058377>.
31. Iragorri N, de Oliveira C, Fitzgerald N, Essue B. The out-of-pocket cost burden of cancer care – a systematic literature review. *Curr Oncol*. 2021;28(2):1216–48. <https://doi.org/10.3390/curroncol28020117>.
32. Knäul FM, Bhadelia A, Rodriguez NM, Arreola-Ornelas H, Zimmermann C. The lancet commission on palliative care and pain Relief- findings, recommendations, and future directions. *Lancet Glob Health*. 2018;6(S1):S5–6. [https://doi.org/10.1016/S2214-109X\(18\)30082-2](https://doi.org/10.1016/S2214-109X(18)30082-2).
33. Mattila PO, Ahmad R, Hasan SS, Babar Z–UD. Availability, affordability, access, and pricing of anti-cancer medicines in low- and middle-income countries: a systematic review. *Front Public Health*. 2021;9:628744. <https://doi.org/10.3389/fpubh.2021.628744>.
34. Mwobobia JM, Sardana S, Abouelella D, Posani S, Ledbetter L, Graton M, et al. Experiences of cancer-related stigma in africa: A scoping review. *Int J Cancer*. 2025;156(12):2265–82. <https://doi.org/10.1002/ijc.35376>.
35. Moodley J, Constant D, Mwaka AD, Scott SE, Walter FM. Anticipated help-seeking behaviour and barriers to seeking care for possible breast and cervical cancer symptoms in Uganda and South Africa. *Ecancermedicalscience*. 2021;15:1171. <https://doi.org/10.3332/ecancer.2021.1171>.
36. Else-Quest NM, Jackson TL. Cancer stigma. In: Corrigan P, editor. *The stigma of disease and disability: Understanding causes and overcoming injustices*. Washington, DC: American Psychological Association; 2014. pp. 165–84.
37. Binka C, Doku DT, Awusabo-Asare K. Experiences of cervical cancer patients in rural ghana: an exploratory study. *PLoS ONE*. 2017;12(10):e0185829. <https://doi.org/10.1371/journal.pone.0185829>.
38. Moodley N, Saimen A, Zakhura N, Motau D, Setswe G, Charalambous S, et al. They are inconveniencing us' – exploring how gaps in patient education and patient-centred approaches interfere with TB treatment adherence. *BMC Public Health*. 2020;20:454.
39. International Pharmaceutical Federation (FIP). Improving access to safe and quality essential medicines and medical devices: the role of pharmacy. The Hague: FIP; 2024.
40. World Health Organization & International Agency for Research on Cancer. Global cancer burden growing, amidst mounting need for services [News release]. Geneva, Switzerland: Lyon, France; 2024. Available from: <https://www.who.int/news/item/01-02-2024-global-cancer-burden-growing-amidst-mounting-need-for-services>. Cited 2025 Mar 6.
41. Mosam A, Shaik F, Uldrick TS, Esterhuizen T, Friedland GH, Scadden DT, et al. A randomized controlled trial of highly active antiretroviral therapy versus highly active antiretroviral therapy and chemotherapy in therapy-naïve patients with HIV-associated Kaposi sarcoma in South Africa. *J Acquir Immune Defic Syndr*. 2012;1(2):150–7. <https://doi.org/10.1097/QAI.0b013e318251aedd>.
42. Coghill AE, Thompson Z, Bamford L, Burkholder G, Enron J, Gopal S, et al. The association of immunosuppression and HIV control with Kaposi sarcoma among patients on antiretroviral therapy. *AIDS*. 2025;39(1):1963–9. <https://doi.org/10.1097/QAD.0000000000004303>.
43. Castilho JL, Kim A, Jenkins CA, Grinsztejn B, Gotuzzo E, Fink V, et al. Caribbean, Central, South America network for HIV epidemiology (CCASAnet). Antiretroviral therapy and kaposi's sarcoma trends and outcomes among adults with HIV in Latin America. *J Int AIDS Soc*. 2021;24(1):e25658. <https://doi.org/10.1002/jia2.25658>.

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