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Analysis of Cancer Care Services: A Case Study Approach in the Eastern Cape Province, South Africa

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The author(s) declares that the research was conducted without any commercial or financial relationships that could be construed as a potential conflict of interest.

ABSTRACT

Purpose: This study examines the relationship between medication shortages and supply chain inefficiencies within the healthcare system, particularly in cancer care. Furthermore, it examines how logistical challenges, including delays and inadequate distribution networks, worsen the shortage of critical cancer medications, affecting patient access to essential treatments.

Research Design and Methodology: To understand how these supply chain inefficiencies impact healthcare delivery in oncology, a qualitative approach incorporating a literature review and case studies is used. The study applies supply chain resilience theory to assess current logistics' effectiveness and identify areas for improvement.

Findings and Discussion: The study highlights the significant role of supply chain inefficiencies in exacerbating medication shortages, which directly impact cancer patients' access to life-saving treatments. It underscores the need for better management practices, more efficient distribution systems, and enhanced logistics to address these issues.

Implications: The study stresses the importance of strategic supply chain improvements to ensure the consistent availability of critical medications. The findings aim to guide healthcare policies and practices, particularly in oncology, to enhance patient care and improve healthcare outcomes. Addressing these inefficiencies will facilitate more reliable and timely access to cancer treatments, ultimately improving patient outcomes.

Introduction

Cancer treatment in South Africa's public healthcare system presents significant challenges, particularly for patients in rural areas (Ramathebane et al., 2024; Willie, 2025). This study examines the lived experience of Rose Lovell, a patient diagnosed with high-grade upper tract urothelial cancer who faced severe difficulties in accessing her prescribed chemotherapy regimen (Lovell, n.d.). The study highlights the systemic barriers in oncology care within the Eastern Cape and proposes recommendations for improving service delivery.

Patients in rural areas often struggle with long travel distances to access oncology services, leading to increased financial burdens and treatment delays (Levit, Byatt, Lyss, et al., 2020; Willie, 2025). Rural cancer patients face longer screening delays, increased financial hardship, and higher travel costs for care (Ramashia, Nkosi & Mbonane, 2024; Planey, Spees, Biddell, et al., 2024). Lovell's experience underscores the inadequacies in medical supply chains, as she was initially scheduled for chemotherapy at Nelson Mandela Academic Hospital but had to be redirected to Frere Hospital due

to medication shortages. Zuma and Modiba (2017) found that medicine shortages in Free State district health services stem from pharmacist shortages, limited delegation, procurement red tape, and the absence of an electronic monitoring system. These disruptions delay the continuity of treatment and care and hinder the overall effectiveness of healthcare delivery. As a result, they significantly impact patient outcomes, leading to poorer health results and potentially prolonging recovery (Alrasheedi, Al-Mohaithef, Edrees et al., 2021).

Poor communication within the healthcare system, including inadequate information sharing and lack of proactive patient engagement, significantly disrupts the continuity of care. These communication failures contribute to adverse outcomes such as discontinuity of care, compromised patient safety, and increased dissatisfaction (Vermeir, Vandijck, Degroote et al., 2015). Addressing these barriers requires a multi-faceted approach, including improved funding for oncology services, better logistical planning, and enhanced patient support mechanisms. Policy interventions should ensure consistent drug availability, strengthen referral networks, and integrate patient-centered communication strategies (Patel, Lopez, Blackstock et al., 2020). With targeted reforms, South Africa's public healthcare system can work towards providing equitable and effective cancer treatment, particularly for vulnerable rural populations (Modisakeng, Matlala, Godman, et al., 2020; Ramathebane, Sooro, Maja, Mputsoe et al., 2024; Willie, 2025).

Literature Review

Barriers to Cancer Treatment Access in South Africa

Cancer treatment within South Africa's public healthcare system is hindered by systemic inefficiencies, particularly affecting rural populations. Research has identified persistent challenges in oncology care, including medication shortages, financial burdens, and inadequate healthcare infrastructure (Modisakeng, Matlala, Godman, et al., 2020; Ramathebane, Sooro, Maja, Mputsoe, et al., 2024; Willie, 2025). Stockouts of essential chemotherapy medicine, such as Gemcitabine, frequently disrupt treatment regimens, potentially compromising patient outcomes (Martei, Grover, Bilker, et al., 2020). Medication stockouts delay treatment and increase the likelihood of disease progression, highlighting the urgent need for improved pharmaceutical supply chain management (Martei et al., 2020). Financial and logistical challenges further exacerbate barriers to timely oncology treatment (Bamodu et al., 2024). Studies indicate that patients residing in rural areas face significant economic strain due to the high costs of transportation, poor road infrastructure, accommodation, and incidental expenses associated with traveling long distances for treatment (Levit, Byatt, Lyss, et al., 2020; Willie & Maqbool, 2023). The financial burden is compounded by the lack of reliable patient transport services, which forces individuals to rely on costly private means or endure unsafe waiting conditions (Varela, Young, Mkandawire et al., 2019). Furthermore, inadequate hospital facilities, including overcrowded wards and insufficient hygiene provisions, negatively impact patient experiences and recovery outcomes (Lowe, Woodd, Lange et al., 2019). Addressing these disparities is critical to ensuring equitable cancer care for all South Africans, regardless of geographical location.

Effective patient communication minimizes distress and ensures adherence to prescribed treatment protocols. Research has shown that the absence of structured communication systems within public healthcare institutions often leads to misinformed or uninformed patients, resulting in wasted trips and unnecessary financial expenditure (Snyder, Wu, Miller et al., 2011; Vermeir et al., 2015; Patel et al., 2020). Optimizing digital platforms and technologies, such as robust patient information systems (e.g., SMS alerts and online scheduling tools), can enhance treatment adherence and alleviate patient logistical burdens. These technologies have been shown to improve patient access by reducing appointment wait times and minimizing no-shows through timely appointment reminders (Chung, Martinez, Frosch, et al., 2020). Ensuring transparency and proactive engagement with patients is essential to maintaining trust in public healthcare services, which can be enhanced through advocacy interventions. Despite advocacy's growing visibility in the region, many oncologists and medical professionals involved in cancer detection and treatment remain unaware of the benefits of collaborating with patient advocates (Kizub et al., 2020). Strengthening advocacy efforts and policy interventions is essential for addressing systemic challenges and enhancing cancer care

outcomes. Organizations such as the Cancer Association of South Africa (CANSA) have been instrumental in highlighting gaps in oncology services and advocating for patient rights (CANSA, 2019). Strengthening supply chain management, enhancing patient support services, and increasing governmental accountability is imperative for sustainable oncology care improvements. Further research is needed to assess the long-term impact of healthcare reforms on treatment accessibility and patient survival rates in South Africa's public sector. The following section outlines the theoretical framework that was utilized in this study. It explains the key concepts and theoretical foundations that guided the research methodology and analysis.

Theoretical framework

This study applies the Supply Chain Resilience theory to assess logistics effectiveness within South Africa's oncology care system, focusing on rural communities with limited resources and infrastructure. The theory emphasizes the ability of supply chains to adapt to disruptions, ensuring continuous healthcare delivery despite logistical challenges (Ponis & Koronis, 2012). In rural areas, the lack of cancer treatment centers, poor infrastructure, and medication shortages make it crucial to build resilience by improving supply chain coordination, forecasting, and stock management. Strategies such as contingency planning and buffer stocks are essential for minimizing disruptions and ensuring consistent access to cancer care, particularly for underserved populations in rural regions.

Research Design and Methodology

Study Methods

This study adopts a qualitative case study approach to explore the systemic barriers faced by cancer patients in South Africa's public healthcare system. According to Silverman (1997) and Silverman (2004), qualitative research is a methodological approach that seeks to understand social phenomena in their natural settings, focusing on the meanings, experiences, and interpretations that individuals or groups attach to their actions and interactions. Qualitative studies that focus on specific lived experiences are widely acknowledged for their capacity to offer in-depth insights into complex real-world issues, especially within healthcare settings (Yin, 2018). The lived experience of Rose Lovell, a patient undergoing cancer treatment in the Eastern Cape, serves as the focal point of this study, illustrating broader systemic challenges in oncology care. A qualitative approach is appropriate for capturing lived experiences, emotional distress, and logistical difficulties encountered by patients, which may not be adequately reflected in quantitative data alone (Creswell & Poth, 2018). Data collection was primarily based on a first-person narrative account provided by the patient, supplemented by secondary sources, including policy documents, healthcare reports, and prior research on oncology service delivery in South Africa. Narrative analysis was employed to interpret the patient's experiences, identifying recurring themes such as medication shortages, financial hardship, and inadequate patient communication (Riessman, 2008). Triangulation was achieved by including advocacy efforts by organizations such as the Cancer Association of South Africa (CANSA), which contextualized the patient's experiences within a broader policy and service delivery framework. Given the sensitivity of the subject matter, ethical considerations were paramount in this study. However, informed consent was not sought because the information analyzed is already in the public domain. This case study serves as a critical lens through which systemic inadequacies in oncology care can be examined, aligning with existing research on healthcare access disparities in low-resource settings (Mansour, Shamieh & Mansour, 2023; Jolidon, Eicher, Peytremann-Bridevaux et al., 2024; Willie, 2025).

Findings and Discussion

Findings

Case study

Rose Lovell, a resident of Tsweleni, a rural village near Port St. Johns in the Eastern Cape Province In South Africa, was diagnosed with high-grade upper tract urothelial cancer following the surgical removal of a kidney and ureter. She was prescribed a chemotherapy regimen comprising Cisplatin

and Gemcitabine, requiring 12 sessions administered at Nelson Mandela Academic Hospital (NMAH) in Mthatha. However, due to stock shortages at NMAH, she was redirected to Frere Hospital in East London, necessitating an 11-hour round trip for each session.

The case study of Rose Lovell highlights several thematic areas requiring urgent intervention to address inefficiencies in oncology care within South Africa's public healthcare system. Medication stockouts and supply chain management emerge as critical issues, with persistent shortages of essential chemotherapy drugs disrupting treatment regimens and placing patients at risk of incomplete therapy. The lack of a reliable supply chain for oncology medications necessitates urgent policy reforms to ensure timely procurement and distribution, particularly in rural healthcare facilities (Patel, Lopez, Blackstock et al., 2020). Logistical and financial burdens present another major challenge, as rural patients like Rose Lovell face significant transportation costs and long travel distances to access treatment. The financial strain of frequent Frere Hospital trips exceeding R3,000 per session underscores the need for a subsidized patient transport system. Government intervention in decentralizing oncology services by equipping regional hospitals with chemotherapy facilities could reduce travel burdens and improve accessibility for patients in remote areas.

Patient communication and support services require considerable improvement, as inadequate information regarding medication availability led to wasted trips and heightened emotional distress. A structured communication framework, such as SMS notifications or a dedicated patient liaison system, could enhance transparency and reduce unnecessary travel. Furthermore, poor hospital accommodation conditions, including unhygienic facilities and lack of privacy, negatively impact patient recovery and overall well-being. Advocacy and policy reform remain essential in addressing these systemic inefficiencies, with organizations like CANSA playing a pivotal role in championing patient rights and highlighting critical gaps in oncology care. Strengthening patient advocacy structures through increased government engagement and public-private partnerships could drive sustainable improvements in cancer treatment accessibility. Additionally, enhanced oversight and accountability mechanisms are required to ensure healthcare policies prioritize oncology care, particularly in underserved regions.

Cancer treatment in South Africa's public healthcare system faces significant barriers, particularly in rural areas, where patients experience long travel distances, financial burdens, and delays in treatment. Research supports these findings, indicating that rural cancer patients often deal with increased costs, transportation challenges, and longer wait times for screenings and treatment (Levit et al., 2020; Willie, 2025). Rose Lovell's experience exemplifies these issues, as she was forced to travel long distances due to medication shortages and a lack of coordination between hospitals (Zuma & Modiba, 2017). These logistical challenges disrupt treatment regimens, which could worsen health outcomes, confirming findings from Alrasheedi et al. (2021) and Martei et al. (2020).

Medication shortages were a significant issue in Lovell's case, as she was redirected to a different hospital due to a stockout of chemotherapy drugs. This reflects broader systemic issues, where logistical inefficiencies in procuring and distributing cancer medications directly impact treatment continuity (Zuma & Modiba, 2017). Research also highlights that these shortages are often caused by inadequate qualified personnel, inefficient procurement systems, and the absence of real-time tracking (Willie, 2025). These deficiencies contribute to treatment delays and can affect patients' chances of successful outcomes (Patel et al., 2020). In addition, poor communication within the healthcare system was a critical finding. In Lovell's case, a lack of information led to wasted trips and unnecessary distress. Studies show that poor communication between healthcare providers and patients exacerbates treatment delays and patient dissatisfaction (Vermeir et al., 2015). Improving communication mechanisms like patient notification systems could prevent these issues and reduce unnecessary patient travel. Moreover, addressing the lack of logistical support, such as patient transport systems, would ease the financial burden on rural cancer patients and improve treatment adherence (Bamodu et al., 2024).

The study also highlights the importance of advocacy and policy reform. Organizations like CANSA have played a key role in pushing for improvements in oncology care, but further policy interventions are needed to address systemic issues in treatment access (Kizub et al., 2020). Strengthening

advocacy and building better public-private partnerships can create long-term solutions for improving cancer care, especially for underserved populations (Modisakeng et al., 2020).

Discussion

The study is consistent with existing literature on the barriers to cancer care access in rural South Africa, particularly concerning medication shortages, logistical challenges, and communication failures. It highlights the urgent need for structural reforms within the healthcare system to ensure that cancer patients receive timely and effective treatment. The following section presents a model derived from the assessment conducted in this study, which could be implemented at a systems level to address the identified gaps.

Key interventions and proposed conceptual model

Key inventions in cancer care address various challenges to improve treatment accessibility and patient well-being. The National Cancer Drug Monitoring System aims to resolve medication shortages and supply chain inefficiencies, ensuring reliable drug distribution. Implementing a Subsidized Patient Transport System can significantly alleviate financial and logistical challenges, especially for rural patients, thereby improving accessibility to care. One effective intervention could be introducing transportation models, such as providing patient transport vouchers or subsidies. Enhancing transportation availability between rural health centers, district hospitals, and central hospitals could reduce transportation barriers, ensuring patients can access essential cancer healthcare services more efficiently (Varela, Young, Mkandawire et al., 2019).

The Decentralization of Oncology Services improves regional cancer treatment options and supports rural healthcare access. Meanwhile, a Structured Communication Framework, like SMS notifications, fosters better patient communication and transparency, helping to reduce patient distress. Upgraded hospital infrastructure in oncology wards enhances privacy, sanitation, and patient recovery. Cancer patient advocacy structures advocate policy reform and improve access to care, while public-private partnerships in oncology work towards sustainable treatment access and strengthen the healthcare system, as outlined in Table 1.

Table 1. Key Inventions in Cancer Care

Key Invention	Area on intervention
National Cancer Drug Monitoring System	The **National Cancer Drug Monitoring System** addresses medication shortages, supply chain inefficiencies, and drug distribution, which are highlighted as significant barriers to effective cancer care (Martei et al., 2020; Patel et al., 2020).
Subsidized Patient Transport System	As Levit et al. (2020) and Varela et al. (2019) noted, a subsidized patient transport system could alleviate logistical challenges and financial burdens, enhancing rural healthcare access and improving patient accessibility.
Decentralization of Oncology Services	The **Decentralisation of Oncology Services** is critical for improving rural healthcare access, providing regional cancer treatment, and addressing systemic gaps in the healthcare system (Modisakeng et al., 2020; Willie & Maqbool, 2023).
Structured Communication Framework (e.g., SMS notifications)	Implementing a **Structured Communication Framework**, such as SMS notifications, could significantly reduce patient distress by improving medication availability transparency and ensuring timely communication (Snyder et al., 2011; Vermeir et al., 2015).
Improved Hospital Infrastructure (Oncology Wards)	Enhancing **Hospital Infrastructure**, specifically oncology wards, can improve hospital conditions, sanitation, and patient privacy, contributing to better recovery outcomes and overall patient well-being (Lowe et al., 2019; Patel et al., 2020).
Cancer Patient Advocacy Structures	As Kizub et al. (2020) and CANSA (2019) highlighted, strengthening cancer patient advocacy structures is essential for influencing policy reform and enhancing patient rights.
Public-Private Partnerships in Oncology Care	**Public-private partnerships in Oncology Care** could play a pivotal role in strengthening the healthcare system and ensuring sustainable access to cancer treatment, as discussed by Patel et al. (2020) and Martei et al. (2020).

The model derived from this study, as depicted in Figure 1, illustrates the critical relationship between medication shortages and supply chain inefficiencies within the healthcare system. It highlights how supply chain inefficiencies, such as delays, mismanagement, or logistical obstacles, lead to medication shortages. These shortages hinder the availability of essential medications and

disrupt the smooth distribution of drugs to healthcare facilities. As a result, healthcare logistics are significantly impacted, creating a ripple effect that compromises the efficiency of healthcare delivery. The figure emphasizes how these challenges are interconnected, showing that medication shortages are not isolated issues but are part of a broader systemic problem. Addressing these inefficiencies within the supply chain is essential to ensuring timely and effective drug distribution, a foundational step towards improving overall healthcare operations. This interconnectedness underscores the importance of optimizing supply chain management as a first step in tackling the complex issues that affect patient care and healthcare outcomes.

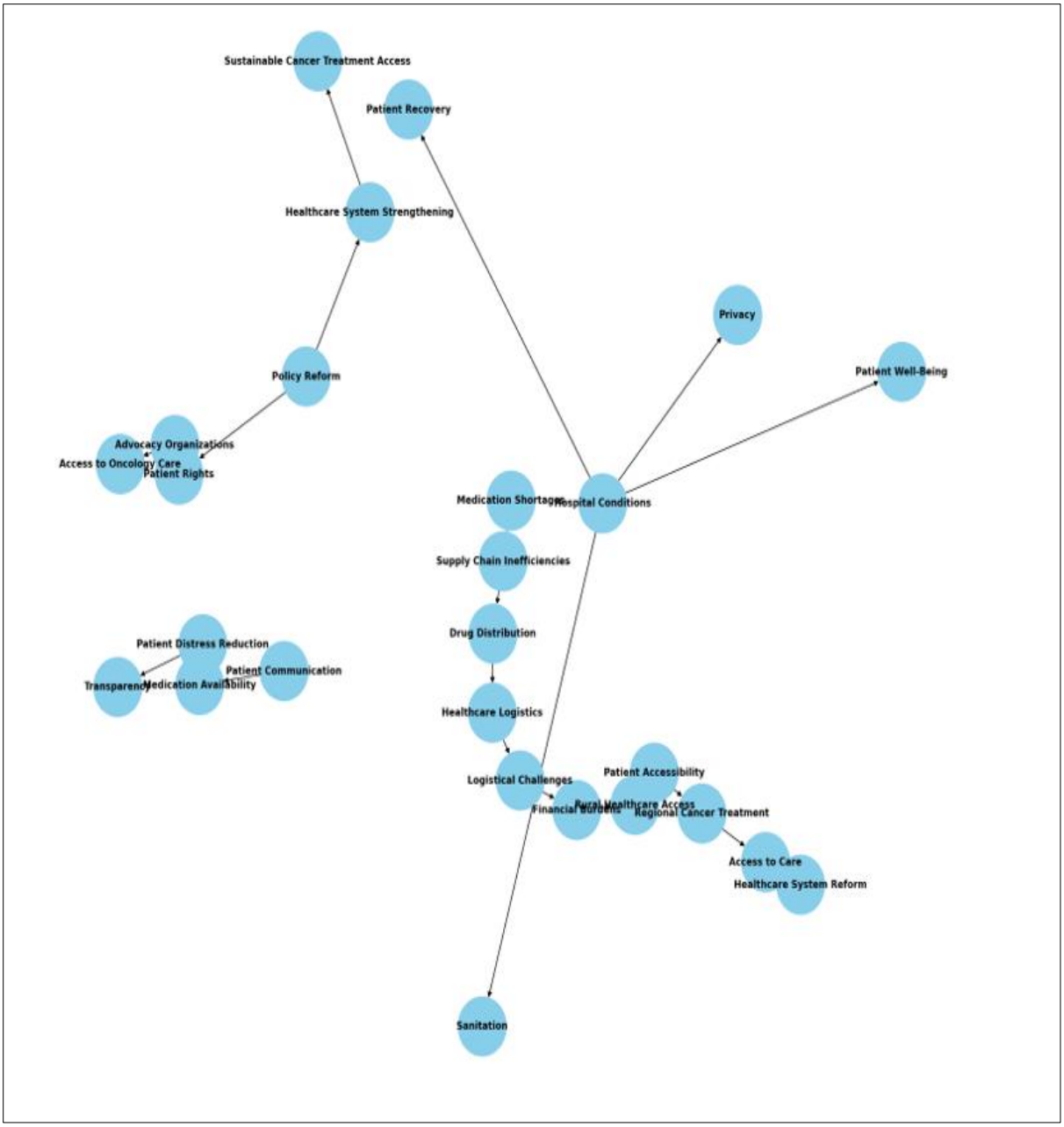

Figure 1. The Interconnected Model of Medication Shortages and Supply Chain Inefficiencies in Cancer Care

Conclusion

This study presents valuable insights into the systemic barriers to cancer treatment within South Africa's public healthcare system, particularly in rural areas such as the Eastern Cape. However, it is not without limitations. Firstly, the case study methodology, while providing in-depth qualitative insights into the lived experience of Rose Lovell, focuses on a single patient's experience, which may

not fully represent the diverse challenges faced by all cancer patients in rural areas. Additionally, the data used in this study relies primarily on the first-person narrative of one individual, which may introduce subjectivity and limit the generalizability of the findings. The study also does not explore the perspectives of healthcare providers, policymakers, or other key stakeholders, which would have provided a more comprehensive understanding of the barriers to cancer care. Future research could broaden the scope by including multiple case studies from different regions, offering a more representative view of cancer patients' challenges in South Africa's rural healthcare settings. Comparative studies between rural and urban areas could further elucidate the disparities in access to cancer treatment. Additionally, a longitudinal approach would allow for a deeper exploration of the long-term effects of treatment delays on patient outcomes and survival rates.

Given the identified barriers, it is recommended that the South African government prioritize improvements in oncology supply chains and the decentralization of cancer services. Strengthening communication between healthcare providers and patients through digital platforms could reduce logistical inefficiencies and improve treatment adherence. Additionally, investment in rural healthcare infrastructure, including better transport services and the expansion of oncology facilities at regional hospitals, would alleviate some of the financial and logistical burdens patients face. Policy reforms should also include measures to address the root causes of drug stockouts, such as inadequate procurement processes and delayed supplier payments.

The barriers faced by Rose Lovell and other cancer patients in South Africa’s public healthcare system are multifaceted and deeply rooted in possible systemic inefficiencies. Medication stockouts, financial burdens, inadequate patient communication, and substandard hospital conditions all contribute to the challenges faced by rural cancer patients. Addressing these issues requires a comprehensive approach that includes policy reforms, improved funding, service decentralization, and effective communication systems.

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