Factors Influencing eHealth Adoption Potential in a Private Hospital in Soshanguve

Mini-dissertation submitted in fulfilment of the requirements for the degree Masters of Business Administration at The Independent Institute of Education, IIE MSA

Thabiso Masilo Rampedi

[redacted]

Supervisor: Ms DM Nupen

Submission date: 31/10/2025

Declaration

I, Thabiso Masilo Rampedi declare that this Research Report entitled "Factors Influencing eHealth Adoption Potential in a Private Hospital in Soshanguve" submitted for the Master of Business Administration degree to The Independent Institute of Education is my own, unaided work and has not been previously submitted to another University or Higher Education Institution for degree purposes. Any assistance that I have received has been duly acknowledged in the report.

Except where reference is made in the text, this report contains no material published elsewhere or extracted in whole or part from a thesis or report presented by me for another qualification. No other person's work has been used without due acknowledgement in the main text of the report. Excluding previous submissions and formal IIE templates, all similarity scores are below 1%.

Signed: 

Date: 28/01/2026

Abstract

The aim of this study was to identify key factors influencing the adoption of an electronic health record (EHR) system among healthcare professionals in a semi-urban private hospital in Soshanguve, South Africa. It addressed a pre-implementation decision need for leadership who have limited context-specific evidence to guide digital health investment. The study drew on established eHealth adoption literature, including the technology acceptance model, the unified theory of acceptance and use of technology, the diffusion of innovation theory, the telehealth readiness model, and the connected health model, to develop a contextualised, pre-implementation lens for systematically identifying and screening potential adoption factors. Guided by an interpretivist paradigm, a qualitative single-site case study was conducted in three phases: identifying and screening theoretical adoption factors; developing a semi-structured interview guide aligned to a conceptual model; and thematically analysing interviews with ten purposively selected healthcare professionals. Adoption was conceptualised as a readiness challenge prior to implementation rather than a post-adoption behavioural outcome.

The findings identified six interdependent factors shaping EHR adoption potential: system usefulness, trialability, facilitating conditions, technological infrastructure, staff training, and social factors (leadership and peer dynamics). These factors span system-centric, institution-centric, and people-centric domains, demonstrating that adoption readiness reflects the alignment of organisational capacity, human capability, and system affordances. The study contributes context-specific adoption determinants for a semi-urban private healthcare setting, extending established adoption theories into a pre-implementation context. The results provide actionable guidance for phased EHR implementation planning, training prioritisation, infrastructure strengthening, and leadership-led change enablement.

Keywords: adoption readiness; eHealth; electronic health record adoption; healthcare digital transformation; semi-urban healthcare; South Africa

Table of Contents

List of Figures

List of Tables

List of Appendices

List of Acronyms and Abbreviations

Acronym/Abbreviation	Definition
AI	Artificial intelligence
CHM	Connected health model
DOI	Diffusion of innovations
DT	Digital transformation
eHealth	Electronic health
EHR	Electronic health record
ICT	Information and communication technologies
IT	Information technology
mHealth	Mobile health
NHI	National Health Insurance
POPIA	Protection of Personal Information Act
TAM	Technology acceptance model
TRM	Telehealth readiness model
UTAUT	Unified theory of acceptance and use of technology

Chapter 1
Introduction and Background

1.1 Introduction

The implementation of electronic health (eHealth) technologies has accelerated globally as healthcare providers embrace digital transformation (DT) to enhance delivery, coordination, and decision-making (Stoumpos et al., 2023; WHO [World Health Organisation], 2023). eHealth refers to the use of digital technologies, information systems, and telecommunication tools to enhance patient engagement, clinical workflows, and data-driven care (Bahl et al., 2020; Ye, He and Beestrum, 2023). Core solutions include electronic health records (EHRs), remote consultations, mobile health (mHealth) applications, and AI (Artificial Intelligence)-assisted diagnostics (NDoH [National Department of Health], 2019; Gartner, 2024). Realising the benefits of eHealth depends both on technology and on the extent to which healthcare professionals adopt that technology. eHealth adoption, therefore, denotes the acceptance, integration, and consistent use of eHealth systems by professionals and institutions within everyday practice (Venkatesh et al., 2003; Gagnon et al., 2019). Meaningful adoption is a prerequisite for the long-term success and sustainability of digital solutions (Wang et al., 2024; Craig et al., 2025). This is because adoption processes significantly influence organisational performance, workload reduction, and healthcare delivery outcomes across diverse clinical settings.

In South Africa, adoption unfolds within a dual healthcare system. This system comprises a large, resource-constrained public (government-funded) sector and a technologically advanced but less accessible private (privately-funded) sector (Abbott & Sigamoney, 2024). This dual system creates marked disparities in healthcare access and quality between population groups (Harris et al., 2011; Ngene, Khaliq & Moodley, 2023). Broadly speaking, the government-funded healthcare sector is geared toward being accessible to rural and economically disadvantaged populations (International Citizens Insurance, 2025). The privately-funded sector is more likely to be found in urban environments, servicing patients who have healthcare insurance.

Semi-urban healthcare settings, positioned along the continuum between urban and rural healthcare environments, exhibit characteristics of both healthcare sectors (OECD [Organisation for Economic Co-operation and Development], 2023; Statistics South

Africa, 2023). Semi-urban areas typically have moderate population densities, basic but even infrastructure, mixed socioeconomic dynamics, and transitional service environments that are not fully urbanised but more developed than traditional rural areas. Townships such as Soshanguve exemplify this continuum, where public hospitals reflect systemic limitations of the broader public sector, while private facilities offer advanced technologies that remain financially inaccessible to many residents (Harris et al., 2011; Competition Commission, 2024). Within semi-urban healthcare settings, healthcare institutions face two key pressures. The first is the rising demand for modern services, and the second is persistent infrastructure gaps (Deloitte, 2025). The transitional character of semi-urban healthcare facilities places them in a unique position as priority sites for pragmatic, context-sensitive eHealth implementation (ResearchAndMarkets, 2025). Situated at the intersection of South Africa's public and private healthcare systems, semi-urban settings serve as pivotal spaces for exploring patterns of EHR adoption.

In many healthcare settings, the implementation of EHRs serves as a practical entry point for eHealth integration. This is because the successful adoption of EHR technology can pave the way toward increased levels of eHealth implementation (Murthi et al., 2024). Indeed, additional eHealth tools such as digital clinical decision support (Solomon et al., 2023), medication safety (Hamad & Bah, 2022), and equity-oriented interventions (Rangachari, Al Arkoubi & Shindi, 2025) are often integrated into EHRs once the initial EHR introduction has been successfully completed. EHRs, therefore, serve as the foundation of digital infrastructure for clinical documentation and the seamless flow of patient information across care teams (Mugauri et al., 2025).

When implemented effectively, EHRs can enhance documentation quality and facilitate timely and coordinated clinical decision-making (Cho et al., 2024; Douma et al., 2024; Torab-Miandoab et al., 2025). Conversely, when EHR design and implementation diverge from clinical workflows, they can lead to increased documentation burdens, disrupted work patterns, and eroded clinician trust in the system (Alobayli, et al., 2023; Cho et al., 2024). In semi-urban healthcare facilities, successful EHR implementation can serve as a bridge between the government- and privately-funded healthcare sectors (Kruse et al., 2016). Appropriately contextualised and aligned investments in eHealth technologies are best positioned to translate into operational improvements, greater

care accessibility, and improved patient outcomes (Scott & Mars, 2021). Therefore, understanding the determinants of successful eHealth adoption within such semi-urban institutions is crucial (Simbini et al., 2025). Thus, identifying factors that most influence EHR adoption, contextualised to the setting of semi-urban South African healthcare, is central (Lovemore et al., 2024; de Villiers et al., 2025). This understanding can provide decision-makers with support to ensure that investment in digital tools yields operational improvements and patient-value gains rather than perpetuating existing implementation failures and inequities.

1.2 Background to the study

The adoption of EHRs within the South African healthcare industry unfolds within a complex interplay of institutional dynamics, technological infrastructure, and professional practice. Structural inequities and capacity constraints have shaped the healthcare DT trajectory, limiting its pace and scope (Coovadia et al., 2009; Harris et al., 2011; Mills et al., 2012; Van den Heever, 2012). As a result, progress across public and private healthcare remains uneven, marked by disparities in access, quality, and digital readiness.

To address systemic fragmentation, the South African national government developed several digital health policy frameworks, including the National eHealth Strategy 2012/13–2016/17 and the National Digital Health Strategy for South Africa 2019–2024, led by the NDoH (2012; 2019). The aim of these frameworks has been to promote standards-based interoperability, enterprise health architectures, and secure, patient-centred EHRs across both public and private sectors. However, despite this strategic intent, policy implementation progress has been uneven across these sectors (Tsegaye & Flowerday, 2021; Zharima, Griffiths & Goudge, 2023; Casanova, Villa-Garzon & Branch-Bedoya, 2025). Persistent barriers include infrastructure and connectivity shortfalls, constrained public-sector financing, incompatibility between legacy information systems, and variable digital readiness and skills capacity among healthcare workforces.

Against this backdrop, semi-urban hospitals illustrate the layered challenges of EHR adoption in practice (Zharima, Griffiths & Goudge, 2023). These institutions operate under hybrid conditions, facing the rising demand and case complexity typical of urban

facilities, while simultaneously contending with bandwidth instability, power interruptions, fragmented referral networks, and differing levels of digital literacy in surrounding communities (Cuadros et al., 2025; Khumalo & Moloi, 2025; Mwansa, Ngandu & Mkwambi, 2025). The semi-urban context, therefore, heightens the potential value of eHealth solutions to streamline referrals, improve documentation, and ensure better continuity across providers (Erku et al., 2023; Harerimana, 2025; Sylla, Ismaila & Diallo, 2025). Yet, these same solutions can also amplify risks when adoption is under-resourced or poorly aligned (Tsai et al., 2020; Provenzano, 2024).

Before committing to full-scale implementation, healthcare decision-makers must, therefore, understand the determinants of site-specific digital readiness. Leaders of South African semi-urban healthcare providers require evidence of the specific factors shaping EHR adoption (Harerimana, 2025; Khumalo & Moloi, 2025). Generating such insight before deployment can help avoid delays, reduce workflow disruptions, and support realistic change-enablement planning, contributing both academically and practically to a priority area of the national health agenda (NDoH, 2024; Zharima, Griffiths & Goudge, 2023). An improved and contextually aligned understanding of factors shaping EHR adoption in semi-urban healthcare settings can inform planning and policy-aligned execution, enabling targeted DT strategies that reflect both the opportunities and constraints of semi-urban South African healthcare.

1.3 Preliminary literature review

The healthcare sector is undergoing a rapid DT, integrating digital technologies into systems, processes, and services. eHealth integrates EHRs, telemedicine, mHealth, health information exchanges, e-prescribing, patient portals, and AI-assisted decision support to enable responsive, data-driven, and patient-centred services (Bahl et al., 2020; Wallis et al., 2021; Otto et al., 2023; Ye, He and Beestrum, 2023). Within this ecosystem, EHRs are foundational. EHRs are digital repositories that store comprehensive patient information, including medical history, diagnoses, medications, test results, and treatment plans, across time and care settings. EHRs support real-time data access, reduce duplication of services, and enhance clinical decision-making (Lovemore, 2024; Garner-Jones, 2025). By consolidating longitudinal clinical information, EHRs enhance continuity, reduce duplication, and support timely decision-making (Alomar et al., 2024; Motsi, 2024). Deployment models could be on-premises,

hosted, or cloud-based alternatives. Each model has its own implications for cost, scalability, and data control (Mugauri et al., 2025).

As the backbone of many eHealth initiatives, EHR adoption is often the first and most critical step toward integrated, patient-centred digital healthcare systems (Lovemore, 2024; Motsi, 2024). Adopting EHRs, however, is not merely a technical upgrade but a sociotechnical process (Zharima, Griffiths & Goudge, 2023; Finnegan & Mountford, 2025). This process requires alignment between human, organisational, and technological subsystems (Mugauri et al., 2025). Successful implementation depends on leadership sponsorship, clear communication, participatory design that engages end-users in co-creating workflows, and protected time for training (Gagnon et al., 2019; Topol, 2019; Zharima, Griffiths & Goudge, 2023). These factors are repeatedly linked to sustained use and help manage resistance to technological change (Finnegan & Mountford, 2025; Mugauri et al., 2025).

Within South African healthcare, regulatory compliance and data governance are central to eHealth adoption. The Protection of Personal Information Act (POPIA) sets conditions for lawful processing, security safeguards, and data subject rights, shaping clinician trust and system configuration (Staunton et al., 2021). National strategies further prioritise interoperability and enterprise architecture for data sharing, including conformance to international standards such as Health Level Seven and the implementation of unique patient identifiers (NDoH, 2012; 2019).

Yet, empirical studies highlight persistent barriers to adoption, including heterogeneous legacy systems, limited adoption of standards, connectivity variability, and fragmented governance (Zharima, Griffiths & Goudge, 2023; Bostan et al., 2024; Adegoke et al., 2025). Workforce readiness also remains a critical determinant. Digital literacy baselines, role-specific training, super-user support, and time for learning all influence adoption outcomes (Alzghaibi & Hutchings, 2024; Nguyen et al., 2024; Mabaso, Mokonyama & Mitonga-Monga, 2025). Even when implementing identical software, facilities can experience divergent results depending on leadership, culture, and post-implementation support (Zharima, Griffiths & Goudge, 2023). Ensuring workflow fit is essential (Black et al., 2011; Staunton, Slokenberga & Mascalzoni, 2022), with processes mapped to avoid duplication, inefficiency, and interoperability gaps across healthcare departments.

While the benefits of EHRs are well-documented in principle (Blumenthal, 2010; Adler-Milstein & Jha, 2017), realising them in semi-urban settings requires tailored implementation strategies. These include phased rollouts, targeted training, and support models that reflect staffing levels and patient flows. A growing body of literature underscores the importance of pre-implementation readiness in determining the success of eHealth and broader DT initiatives. Studies show that assessing and strengthening organisational, technological, and human factors before deployment significantly improves adoption outcomes and long-term sustainability (Cresswell et al., 2019; Nilsen & Bernhardsson, 2019; WHO, 2023). In particular, readiness assessments tailored to semi-urban and resource-constrained environments enable institutions to anticipate barriers and design context-sensitive strategies that support effective integration of EHRs and other eHealth systems (Agarwal et al., 2022; Kaswa & von Pressentin, 2025).

1.4 Research problem

EHR adoption is shaped by multiple interdependent factors. These factors include perceived usefulness and usability, sociotechnical fit, infrastructure and workforce readiness, and regulatory compliance (Venkatesh et al., 2003; Greenhalgh et al., 2017; Musakuro & Gie, 2025). The leadership of a participating South African semi-urban, private hospital situated in Soshanguve intends to implement an EHR system. Soshanguve, a large township located north of Pretoria in the Gauteng Province, is known for its diverse population and proximity to several educational and healthcare institutions (City of Tshwane Metropolitan Municipality, 2022; Statistics South Africa, 2023). If the leadership of the participating hospital can drive successful implementation and adoption of the EHR system, this system can become the cornerstone of the hospital's eHealth strategy (Ogundaini & Mlitwa, 2024).

Despite the digitally transformative strategic intent of the participating semi-urban, private hospital, the leadership team lacks a context-specific, pre-implementation appraisal of the key eHealth adoption determinants. These determinants include technological, organisational, and people-centred aspects of DT that will shape adoption by healthcare professionals (Musakuro & Gie, 2025; Simbini et al., 2025). In a semi-urban environment marked by intermittent connectivity and power, uneven digital skills, and stringent POPIA requirements, proceeding without such insight risks costly delays,

workflow disruption, low technology utilisation, and erosion of expected benefits (Adler-Milstein & Jha, 2017; Prasad, 2025). Conversely, a grounded understanding of local adoption factors can unlock substantial value, such as improved documentation accuracy, continuity of care, safer decision-making, and more efficient referrals, by informing targeted investments (infrastructure redundancies, interoperability, training design) and change-enablement intent.

This study was positioned to address the lack of context-specific, pre-implementation clarity regarding the factors influencing eHealth adoption within a semi-urban private healthcare hospital. While eHealth adoption models are well established in the literature, there remains a limited evidence-based understanding of how these factors manifest in semi-urban private hospital environments in South Africa prior to system implementation. This absence of contextual clarity constrains informed decision-making and increases the risk of misaligned digital health investments that overlook organisational readiness, infrastructural constraints, and staff preparedness. Addressing this problem is, therefore, essential to support the development of EHR adoption strategies that are both context-sensitive and sustainable, thereby contributing to organisational resilience and alignment with national digital health priorities.

1.5 Research aim

The aim of this study was to identify the key factors influencing the adoption potential of an EHR eHealth system to be implemented among healthcare professionals within a participating semi-urban private hospital in Soshanguve. This aim addressed the identified research problem by clarifying how technological, organisational, and human determinants shape pre-implementation readiness in a resource-constrained, semi-urban environment.

1.6 Research question

The main research question that guided this study was:

RQ_M: Which factors influence the adoption of an EHR eHealth system among healthcare practitioners in a private hospital in Soshanguve?

The main research question was supported by three sub-questions that structured the inquiry:

- RQ_1: What existing theories and models of eHealth adoption in hospitals can inform the identification of key factors relevant to the participating private hospital's pre-implementation context?
- RQ_2: What context-specific conceptual model can reflect the factors expected to influence EHR adoption potential in the participating hospital?
- RQ_3: What final set of key adoption factors is expected to influence the adoption potential of an EHR system among healthcare professionals in the participating hospital?

1.7 Research objectives

To meet the aim and address the research questions, the main research objective of this study was:

RO_M: To identify the factors that influence the adoption of an EHR eHealth system among healthcare practitioners in a private hospital in Soshanguve.

The main research objective was supported by three sub-objectives that structured the inquiry:

- RO_1: To identify existing theories and models of eHealth adoption and extract potential influencing factors that are relevant to the participating private hospital's pre-implementation context.
- RO_2: To develop a context-specific conceptual model reflecting the factors expected to influence eHealth adoption potential in the participating hospital, serving as a foundation for further validation in the context of EHR implementation.
- RO_3: To determine the final set of key adoption factors expected to influence the adoption potential of an EHR system among healthcare professionals in the participating hospital.

Taken together, the research aim, questions, and objectives created a clear pathway through the study. This alignment ensured methodological and theoretical coherence, with each research phase remaining conceptually integrated from the initial problem definition through to the formulation of actionable recommendations.

1.8 Limitations, delimitations, and research assumptions

This study was conducted in a single semi-urban private hospital in Soshanguve, focusing on a pre-implementation assessment of EHR adoption. The findings are context-specific and not intended for statistical generalisation. Usability testing and post-implementation evaluation were beyond the scope of the study, with emphasis placed on identifying factors influencing adoption readiness.

1.8.1 Limitations

The study's limitations should be considered when interpreting the results. The sample size was limited to n = 10 and drawn from one institution, which may limit applicability to other healthcare settings. The semi-urban private context may not reflect adoption dynamics in public or rural hospitals, where infrastructure and policy environments differ. The qualitative nature of the study relied on self-reported data, which may be influenced by personal or institutional bias. Although confidentiality protocols were implemented to encourage openness, subjective interpretation remains a consideration. In addition, infrastructure variability and a fixed data collection timeframe constrained the breadth of findings, precluding longitudinal analysis.

1.8.2 Delimitations

The study was deliberately bounded to ensure focus and feasibility. The study's delimitations include the exclusive focus on one private hospital, the exclusion of public-sector and rural or urban facilities, and the reliance on English-language academic sources.

1.8.3 Research assumptions

The study was based on the assumption that healthcare professionals are central to EHR adoption and that pre-implementation assessments can generate actionable insights for DT in resource-constrained environments. These assumptions guided the research design and interpretation of the findings, recognising that adoption outcomes are shaped by the interplay of technological, organisational, and human factors.

1.9 Research methodology

This study adopted an interpretivist stance, underpinning an exploratory qualitative design suited to understanding the context-specific determinants of eHealth adoption. A hybrid coding approach was employed, combining deductive and inductive elements. To inform the initial framing and interpretation of the study, concepts were extracted from established technology adoption and change theories and models. These included the technology acceptance model (TAM) developed by Davis (1989), the unified theory of acceptance and use of technology (UTAUT) developed by Venkatesh et al. (2003), the diffusion of innovation (DOI) theory developed by Rogers (1962; 2003), the telehealth readiness model (TRM) developed by Jennett et al., (2003) and the connected health model (CHM), developed by Caulfield & Donnelly (2013),

A single-site case study was conducted using semi-structured interviews with ten healthcare professionals, selected through purposive sampling to reflect role diversity. Data collection followed a cross-sectional time horizon, and analysis was guided by thematic analysis. This analysis process was broadly aligned with Braun and Clarke's (2006, 2019) six-phase framework for thematic analysis, while operationalising these phases through NVivo's structured features. Trustworthiness was strengthened through the use of an audit trail and peer debriefing, which enhanced credibility and dependability (Braun & Clarke, 2006; Ross et al., 2016). Figure 1.1 provides a diagram of the research onion that describes the underpinning philosophies of this study.

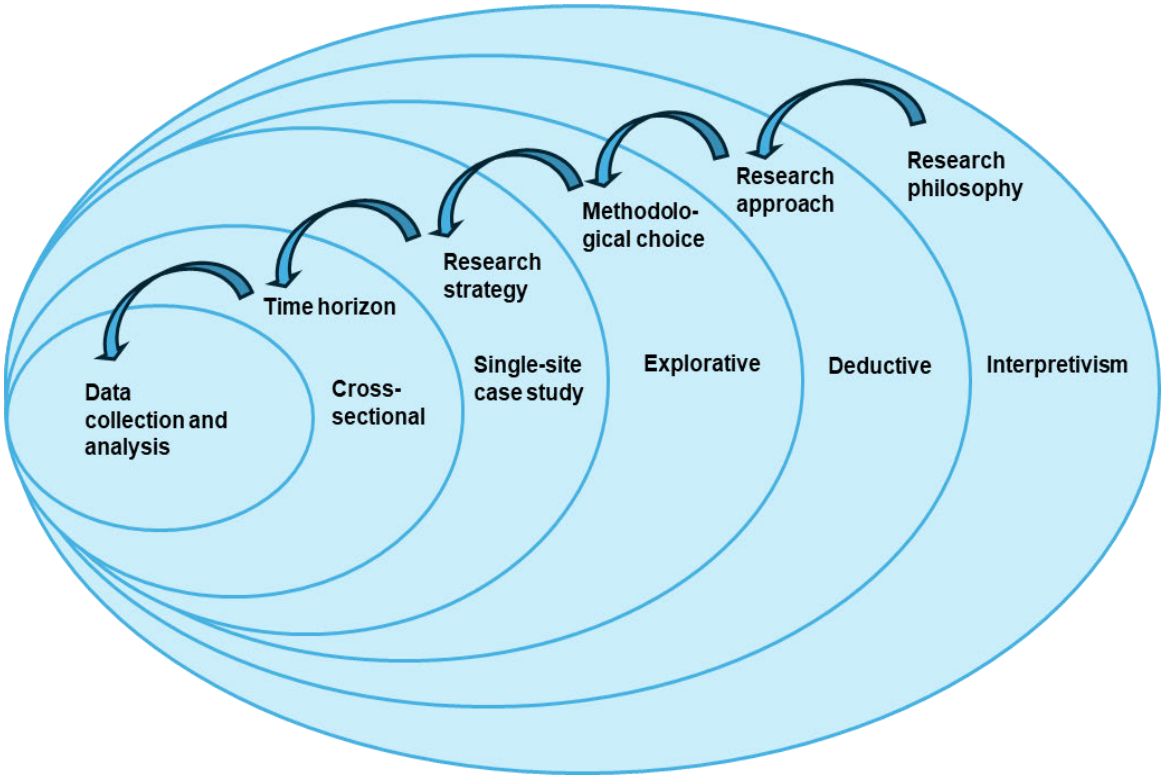


Figure 1.1 Research onion depicting the research philosophies and methodological approaches followed in this study

Adapted: Saunders, Lewis and Thornhill (2019, 2023)

1.10 Ethical considerations

This study followed established research ethics to protect participants and uphold academic integrity. Formal ethical clearance was obtained from the IIE MSA prior to data collection, under ethical clearance number M. 830325 (Appendix A). Gatekeeper permission was secured from the participating private hospital in line with institutional requirements (Appendix B). Participation was voluntary and based on written informed consent with the right to withdraw at any time without penalty (Bryman & Bell, 2007). Confidentiality and privacy were safeguarded through secure data and de-identification of responses in all outputs. Risk was minimised by avoiding sensitive personal topics. The study avoided deception, ensuring that the study purpose was communicated transparently and findings were reported accurately. Academic integrity was maintained through proper citation and referencing in the Harvard Anglia style (Bryman & Bell, 2007).

1.11 Chapter outline

This mini-dissertation comprises five chapters. Each chapter is briefly outlined as follows:

Chapter 1: Introduction and Background

In this chapter, the study is introduced by situating eHealth and EHR adoption within the broader context of South Africa's dual healthcare system and national digital health priorities. The research problem, aim, questions, and objectives are outlined, while the rationale for a pre-implementation focus is explained. The study's methodological approach, ethical considerations, and significance are summarised, and an overview of the dissertation structure is provided.

Chapter 2: Literature Review

In Chapter 2, local and international studies on eHealth, EHR adoption, and DT in healthcare are reviewed, while technology adoption, readiness, and sociotechnical models are critically examined. Furthermore, empirical findings identifying potential adoption factors relevant to semi-urban healthcare environments are synthesised. Finally, a conceptual model of eHealth adoption in the context of the participating hospital is developed.

Chapter 3: Research Methodology

The study's research methodologies the interpretivist research paradigm, qualitative case study design, sampling strategy, data collection methods, and analytical procedures are described in Chapter 3. The three-phase research process, namely factor identification, instrument development using scaled interview questions, and thematic analysis, is explained while considering trustworthiness and ethical considerations.

Chapter 4: Research Results

This study's empirical findings are presented in Chapter 4, reporting on the six contextualised adoption factors identified through thematic analysis, confirmed as the six key adoption factors relevant to the context of the participating hospital. Each factor is supported by participant quotations and summarised in relation to its perceived influence on EHR adoption potential.

Chapter 5: Discussion, Recommendations, and Conclusions

The findings in relation to the theoretical framework are synthesised in Chapter 5, while critical pre-adoption outcomes are consolidated, and practical recommendations for EHR implementation readiness are presented. The mini-dissertation concludes by outlining the study's theoretical contributions and limitations and providing directions for future research.

1.12 Significance of the study

This study addresses a pressing decision-making requirement within a semi-urban private South African hospital, providing evidence to support leaders in determining whether and how to proceed with EHR implementation. By diagnosing hospital-specific adoption determinants prior to procurement, the study offers actionable guidance for sequencing investments, tailoring training programmes, and designing context-appropriate change-management interventions.

Beyond its practical relevance, the study also carries scholarly significance by adapting and integrating established eHealth adoption frameworks into a pre-implementation assessment tailored to a low-resource private setting. In doing so, it contributes context-sensitive evidence to the South African eHealth literature, extending current debates on DT in healthcare and addressing gaps in research on semi-urban private institutions (Scott & Mars, 2015; Herselman & Ruxwana, 2019).

1.13 Summary

The adoption of eHealth presents a significant opportunity to enhance healthcare accessibility, operational efficiency, and the quality of patient care in South Africa. As DT accelerates across the healthcare sector, systems such as EHRs, telemedicine platforms, and mobile health applications are increasingly recognised as critical enablers of responsive, data-driven, and patient-centred care delivery. However, the successful realisation of these benefits depends on the adoption and sustained use of eHealth technologies by healthcare professionals. Their engagement is a decisive factor in overcoming implementation barriers and achieving institutional readiness for DT.

Despite growing national and international interest in eHealth, a notable gap remains in empirical research examining how healthcare professionals in South African semi-urban settings engage with these technologies. Addressing this gap is essential for informing

evidence-based strategies that support sustainable eHealth integration in comparable contexts. Building on the foundation established in Chapter 1, a comprehensive review of the relevant literature is presented in Chapter 2. It examines the South African healthcare environment, the determinants of EHR adoption, and established technology adoption and change theories and models, surfacing gaps specific to semi-urban private healthcare facilities that this study is intended to address.

Chapter 2
Literature Review

2.1 Introduction

Electronic health (eHealth) is broadly defined as the application of information and communication technologies (ICT) in health and associated sectors. In a time of accelerating digital transformation (DT), eHealth has become a central component of contemporary healthcare systems (Bahl et al., 2020; Ye, He & Beestrum, 2023). It is reshaping the delivery, access, and management of medical services by enabling more efficient, data-driven, and patient-centred approaches to care (Musakuro & Gie, 2025). Its growing importance reflects rapid technological innovation, global efforts to reduce healthcare inequalities, and the need for resilient systems in the face of public health crises such as the COVID-19 pandemic (Wallis et al., 2021). Yet despite its promise, the adoption and sustained integration of eHealth technologies remain uneven, underscoring the need to examine the organisational, technical, and human factors that shape successful implementation.

Although eHealth has the potential to enhance effectiveness, accessibility, and quality of care, its uptake is often constrained by a complex interplay of organisational readiness, technological infrastructure, and individual adaptability (Bashshur et al., 2016; Otto et al., 2023). Successful adoption, therefore, requires more than the availability of digital tools. It also depends on supportive institutional policies, adequate resources, and the active engagement of healthcare professionals in integrating these systems into clinical practice (Khan, 2025; Musakuro & Gie, 2025; Sampa et al., 2025). Without such alignment, implementation risks remain high, and the transformative potential of eHealth may not be fully realised (Cresswell et al., 2019; Musakuro & Gie, 2025). eHealth implementation challenges are particularly pronounced in South Africa's dual public–private healthcare system (Coovadia et al., 2009; Abbott & Sigamoney, 2024; Ogundaini & Mlitwa, 2024; Khumalo & Moloi, 2025). Within this system, disparities in infrastructure, resources, and policy environments shape the trajectory of DT.

A critical examination of existing eHealth literature is presented in this chapter, with particular attention to adoption in resource-constrained healthcare settings. The review considers the role and significance of eHealth technologies within the broader healthcare delivery framework, highlighting adoption challenges in South Africa's dual

public–private healthcare system. Specific focus is placed on the obstacles and opportunities associated with electronic health record (EHR) adoption in semi-urban private hospitals, such as those in Soshanguve, and on the contextual factors and implementation considerations that influence the success of DT initiatives in these environments.

2.2 eHealth and types of eHealth systems

In recent years, there has been a significant global shift toward the adoption of eHealth across both public and private healthcare sectors. Integrating eHealth into hospital systems has become essential for modern healthcare delivery in the digital era, particularly as health systems respond to rising patient demands, constrained resources, and evolving public health challenges (Ammenwerth, Iller & Mahler, 2006; Agarwal et al., 2015; Otto et al., 2023). This growing reliance on digital health reflects the need for more resilient, efficient, and patient-centred approaches to care.

eHealth broadly refers to the application of digital technologies, information systems, and telecommunication tools to enhance healthcare delivery, patient engagement, and clinical decision-making (Bahl et al., 2020; Ye, He & Beestrum, 2023). It encompasses a wide range of platforms and services that support clinical, administrative, and population health functions, including data exchange, remote care, and personalised health management (Eysenbach, 2001; Wallis et al., 2021). Key types of eHealth systems include:

- **EHRs** improve continuity of care and minimise duplication by enabling digital recording, storage, and secure exchange of patient data across time and care locations (Provenzano, 2024; Musakuro & Gie, 2025).
- **Telemedicine platforms** expand access to treatment in disadvantaged regions through remote consultations, diagnostics, and monitoring (Caulfield & Donnelly, 2013; Dorsey & Topol, 2020; WHO [World Health Organisation], 2023).
- **Mobile health (mHealth) applications** enhance patient engagement via mobile-based tools for self-care, chronic disease management, and health education (Agarwal et al., 2022; Li, et al., 2025).

- **Health information exchanges** facilitate the exchange of health information across institutions, improving coordination and reducing fragmentation (Dixon et al., 2022; Casanova, Villa-Garzon & Branch-Bedoya, 2025).

Among the range of digital technologies transforming healthcare, EHRs have emerged as the cornerstone of DT (Cresswell et al., 2019; Musakuro & Gie, 2025). Their successful adoption is widely recognised as a critical precursor to establishing digitally integrated and patient-oriented healthcare environments, since they provide longitudinal and accessible patient records that support informed clinical decision-making, reduce administrative burdens, and enable population-level analytics (Cresswell et al., 2019; Musakuro & Gie, 2025). Deployment models vary considerably, with some institutions opting for on-premises systems while others transition to cloud-based platforms, a trend highlighted in recent analyses of implementation strategies (WHO, 2023; Mohammed, 2024). Beyond these operational choices, EHRs underpin interoperability by linking laboratory, radiology, and billing systems, and they play a central role in ensuring compliance with data governance frameworks, including South Africa's Protection of Personal Information Act (POPIA) (Staunton et al., 2021).

2.3 eHealth and South Africa's healthcare system

South Africa's healthcare system is currently undergoing a transformative phase, driven by growing interest in eHealth technologies to improve patient outcomes, strengthen data management, and enhance service delivery (Ogundaini & Mlitwa, 2024; Musakuro & Gie, 2025). The public and private sectors, which collectively make up South Africa's healthcare system, play a crucial role in shaping the organisational, infrastructural, and human dimensions of eHealth adoption (Coovadia et al., 2009; Competition Commission, 2024). As national strategies increasingly promote interoperability and patient-centred care, understanding how eHealth technologies are adopted across healthcare settings has become essential (NDoH [National Department of Health], 2019; WHO, 2023).

2.3.1 eHealth in the South African healthcare context

South Africa's healthcare system is characterised by a dual structure comprising the public and private sectors. Approximately 80% of the population relies on the public sector, which is government-funded and faces persistent challenges, including

inadequate funding, shortages of medical personnel and medications, and long patient wait times (Botes, Cooke & Bruce, 2023; Health Systems Trust, 2024; World Bank, 2024a). By contrast, the private sector serves approximately 20% of the population with advanced services and cutting-edge medical technologies. However, access is largely restricted to individuals who can afford private health insurance or out-of-pocket payments (Econex, 2023; Council for Medical Schemes, 2024). This disparity has prompted debates on universal health coverage and initiatives such as the National Health Insurance (NHI) plan, which seeks to bridge the gap between public and private healthcare provision (Green Paper, 2011; National Treasury, 2024; WHO, 2025b).

Public healthcare is delivered through government-funded clinics and hospitals across rural, semi-urban, and urban areas. In rural settings, district hospitals and community clinics serve geographically dispersed and underserved populations, providing essential services such as maternal care, immunisations, and chronic disease management (Coovadia et al., 2009; NDoH, 2022; SAMRC [South African Medical Research Council], 2024). These facilities often represent the patient's first point of contact with the health system and are central to advancing national public health priorities and universal health coverage objectives (Kredo et al., 2022; Day & Grey, 2023). Yet they face persistent challenges, including underfunding, staff shortages, limited specialist availability, and inadequate infrastructure. Deficits in digital connectivity, diagnostic capacity, and reliable energy supply further hinder service quality and the effective adoption of eHealth solutions (African Development Bank Group, 2022; Nene & Hewitt, 2023). These constraints contribute to long wait times, fragmented care, and inconsistent service quality (Mayosi et al., 2012; Kredo et al., 2022; Ogundaini & Mlitwa, 2024). Therefore, while urban public hospitals are generally better resourced, they continue to struggle with high patient volumes and systemic inefficiencies, complicating DT initiatives.

In contrast, private healthcare in South Africa's urban regions is delivered through well-resourced hospitals and clinics, serving patients with private insurance or the ability to self-finance care (Expatica, 2025). These institutions, typically located in metropolitan areas, offer advanced medical technologies, skilled personnel, and streamlined administrative systems. Patients benefit from shorter waiting times, greater provider choice, and access to high-quality diagnostics and treatments (IOA [In On Africa], 2024;

Intercare, 2024). Many urban private facilities have adopted eHealth systems to enhance operational efficiency, meet accreditation standards, and improve patient experience, often integrating EHRs, telemedicine platforms, and mobile health applications into routine care (Competition Commission, 2024; Ogundaini & Mlitwa, 2024; Musakuro & Gie, 2025). However, despite their technological advancement, these services remain financially inaccessible to most South Africans (Van den Heever, 2012; Blecher, McLeod & Govender, 2019). This inaccessibility reinforces structural inequities in healthcare access and DT outcomes.

Semi-urban healthcare settings, such as peri-urban townships on the outskirts of metropolitan areas, exist as transitional spaces along the rural–urban continuum. Per-urban communities combine aspects of rural impoverishment with urban density (UN-Habitat, 2022; OECD, 2023; Statistics South Africa, 2023). They are typically characterised by rapid spatial development, mixed land use, and unequal access to infrastructure and services. Townships such as Soshanguve illustrate this transitional position, situated between well-equipped metropolitan centres and resource-limited rural areas (Harris et al., 2011; Competition Commission, 2024). They typically feature a mix of public hospitals, which reflect the structural and systemic limitations of the broader public healthcare system, and private facilities that may offer advanced medical technologies but remain financially inaccessible to many residents.

Public healthcare institutions in semi-urban areas frequently face challenges such as infrastructure instability, high patient volumes, and limited access to specialist services. These difficulties mirror broader capacity constraints within South Africa's public health system (Kredo et al., 2022; Ogundaini & Mlitwa, 2024). Private providers, meanwhile, contend with pressures related to balancing service quality, operational sustainability, and affordability (Day & Grey, 2023; Competition Commission, 2024). These must be navigated within the contexts of constrained local purchasing power and uneven medical insurance coverage.

Across both sectors, healthcare delivery is shaped by complex referral pathways and varied patient populations characterised by various levels of digital literacy, healthcare access, and socioeconomic vulnerability. These factors directly influence the adoption and effective use of eHealth technologies (Statistics South Africa, 2023; Simbini et al., 2025). While infrastructural and workforce constraints can hinder implementation,

tailored solutions could improve documentation accuracy, care continuity, and system integration (Mars, 2012; Scott & Mars, 2015; Staunton, Slokenberga & Mascalzoni, 2022). If adapted to local realities, these solutions can yield significant benefits for healthcare delivery and DT.

Readiness for eHealth adoption across rural, urban, and semi-urban settings is shaped not only by infrastructure and workforce capacity but also by the strategic orientation and resource base of healthcare institutions. In the public sector, initiatives are often supported by donor funding and guided by national frameworks such as the NHI and the National Digital Health Strategy, which emphasise interoperability, patient-centred care, and secure data exchange (NDoH, 2012; 2019). Private institutions, particularly in urban and semi-urban areas, tend to adopt eHealth systems to realise several advantages (Yi et al., 2024; Dömbekci et al., 2025; Jose et al., 2025). These include gaining a competitive edge, meeting accreditation standards, and enhancing patient experiences by integrating digital tools into routine care.

Despite these drivers, both public and private healthcare facilities face common challenges, including poor system interoperability, fragmented policy environments, and unequal access to digital tools (Greenhalgh et al., 2023; WHO, 2023; Ogundaini & Mlitwa, 2024). These issues are especially pronounced in semi-urban contexts, where infrastructure volatility and variable digital literacy complicate deployment. National initiatives have introduced data governance and exchange standards such as HL7 (Health Level Seven) and Fast Healthcare Interoperability Resources, alongside unique patient identifiers, to support eHealth implementation (HL7 International, 2023). Yet implementation remains uneven, limiting seamless interoperability and continuity of care (Zharima, Griffiths & Goudge, 2023; Ogundaini & Mlitwa, 2024; Musakuro & Gie, 2025). This inconsistency undermines data-driven decision-making and reduces the transformative potential of eHealth systems.

WHO (2023) and South Africa's NDoH (2019) emphasise sustainability, scalability, and institutionalisation as critical prerequisites for long-term success in eHealth implementation. Emerging evidence, including work by Benatar, Gill and Bakker (2022) and WHO (2023), suggests that digital health technologies can act as equalisers between the overburdened public sector and the more exclusive private sector when embedded within a coherent national framework. In the public sector, where

doctor-to-patient ratios can reach 1:3200 in rural areas, eHealth initiatives have already demonstrated measurable impact. For example, Barron, Pillay and Fernandes (2016) show that mobile platforms such as MomConnect achieved 98% antenatal care coverage among public-sector patients. Mbonane et al. (2024) further report that nurse-led telemedicine hubs reduced specialist wait times by 40% in Eastern Cape pilot programmes, while the NDoH (2023) highlights AI (artificial intelligence)-powered inventory systems that decreased medication stockouts by 58% across Gauteng clinics.

In the private sector, eHealth continues to drive innovation. Remote patient monitoring has reduced hospital readmissions by 22% in chronic disease programmes (Discovery Health, 2023), AI diagnostics have shortened imaging turnaround times by 35%, and blockchain-based health information exchanges have improved care coordination across private networks (Halamka, Tripathi & Hashimoto, 2022; Janneker, 2025). The robust integration of eHealth systems is, therefore, essential for bridging the gap between South Africa's public and private healthcare sectors and advancing DT.

2.3.2 National strategies for a South African digital health framework

The South African government introduced the National eHealth Strategy (2012/13–2016/17) in response to growing demand for a cohesive digital health framework. This strategy sought to establish foundational policies, standards, and governance mechanisms to integrate eHealth into the national healthcare system (NDoH, 2012). It was succeeded by the National Digital Health Strategy (2019–2024), which marked the second phase of the country's digital health agenda. This phase emphasised patient-centred digital health records, interoperability standards, and the creation of a national health information exchange framework (NDoH, 2019). Notable progress included the national expansion of mHealth platforms such as MomConnect, the rollout of the Health Patient Registration System, and initial steps toward unified digital health records in the public sector (NDoH, 2023a). However, adoption remained uneven across provinces and between public and private sectors, largely due to infrastructural and financial disparities.

South Africa has now entered the third phase of digital health development (2024–2029). This strategy positions digital health as a critical enabler for the success of the NHI. Strategic priorities include establishing POPIA-compliant cloud-based health data

exchange systems, integrated telemedicine portals linking public clinics to private specialists, and unified national dashboards for healthcare quality monitoring (NDoH, 2019). Through alignment with the strategy's vision of connected care, South Africa aims to transition from a historically fragmented healthcare system to a digitally integrated national ecosystem (NDoH, 2023b; WHO, 2023). While these strategies provide a clear roadmap for DT, their success depends on overcoming persistent barriers that continue to hinder eHealth adoption across the healthcare sector.

2.3.3 Challenges to the digital transformation of the healthcare sector

Despite numerous national and institutional initiatives, the adoption of eHealth solutions in South Africa has been gradual. Many healthcare institutions struggle to implement digital health technologies effectively (Zharima, Griffiths & Goudge, 2023; Ogundaini & Mlitwa, 2024). Common barriers include gaps in digital skills among healthcare providers and patients (Nguyen et al., 2024; Mabaso, Mokonyama & Mitonga-Monga, 2025), insufficient technological infrastructure (Cresswell et al., 2019; WHO, 2023), high initial mplementation costs, limited interoperability, resistance to change among healthcare professionals (Alzghaibi & Hutchings, 2024; Musakuro & Gie, 2025), and ongoing concerns around data security and privacy (Tsegaye & Flowerday, 2021; McGonigle & Mastrian, 2022). Staff resistance is often rooted in fears of increased workload or inadequate training, while limited interoperability between platforms further complicates system integration.

Recent policy reviews and health systems research highlight that South Africa's hospitals remain underprepared in several key areas. These areas include technological capacity, human capital, and organisational enablers, as noted by the NDoH (2019), WHO (2023), and Ogundaini & Mlitwa (2024). Only 29% of hospitals have the infrastructure required for effective EHR implementation, while interoperability challenges affect 73% of facilities attempting data sharing, according to the Health Systems Trust (2023). Proficiency in EHR usage is limited, with surveys showing that only 41% of healthcare workers are adequately trained. Moreover, the Health and Welfare Sector Education and Training Authority (2023) and Steenkamp, Peltonen and Chipps (2025) report that 68% of organisations lack comprehensive change-management strategies. Financial commitment is also low: just 22% of healthcare institutions allocate more than 5% of operational budgets to DT. Also, governance

remains a concern, with the Board of Healthcare Funders (2023) and the NDoH (2023) indicating that 55% of organisations lack formal structures for managing eHealth projects.

Contemporary literature emphasises that addressing structural, technological, and organisational challenges is essential for successful eHealth adoption. Greenhalgh et al. (2023) and Musakuro and Gie (2025), argue that developing digitally ready institutions and enabling environments is a prerequisite for sustainable implementation. Evidence from Steenkamp, Peltonen and Chipps (2025) shows that low levels of digital readiness, particularly in infrastructure, leadership, and workforce capability, are consistently associated with stalled or failed implementations in resource-constrained settings. Similarly, Herselman and Ruxwana (2019) and Ruxwana, Herselman and Conradie (2010) highlight that comprehensive institutional preparedness is central to ensuring that digital health technologies deliver long-term value.

2.3.4 Addressing eHealth adoption factors for implementation success

The successful adoption of eHealth technologies requires more than the installation of digital systems. It calls for the intentional design of healthcare environments that actively sustain high levels of adoption over time (NDoH, 2019; Greenhalgh et al., 2023; World Bank, 2024a). Achieving this goal depends not only on investment in technological infrastructure but also on critical human elements (Nilsen & Bernhardsson, 2019; Agarwal et al., 2024; Longhini, Rossettini & Palese, 2024). These elements include comprehensive training, digital literacy, leadership support, and fostering a culture that embraces technological change as integral to healthcare transformation.

For eHealth initiatives to realise their full potential, healthcare leaders must, therefore, take proactive strategic action on two critical fronts. Barriers to adoption must be meaningfully addressed while reinforcing enablers of adoption (Buchanan et al., 2013; Vial, 2021). Strengthening readiness across technological, organisational, financial, and human resource domains is crucial to ensure that eHealth implementations are not only completed but also succeed in delivering sustainable improvements in healthcare delivery (Seward, et al., 2021; Alotaibi, Wilson & Traynor, 2025; WHO, 2025). Achieving such readiness provides the foundation for long-term impact and resilience in digital health systems.

2.4 Implementing electronic health records in semi-urban healthcare environments

eHealth systems and strategies must be developed in alignment with the specific context of the healthcare institution. While advanced AI integration and mobile-first platforms may suit high-resource environments, semi-urban hospitals in South Africa are typically resource-constrained. They are, therefore, more likely to benefit from low-barrier EHR systems and gradually introduced virtual consultation tools, which require only moderate infrastructure and can be piloted with minimal disruption to existing workflows (Mars, 2012; Lovemore, 2024). Crucially, successful implementation depends on tailored policy guidance, targeted user training, and sustained financial support.

The strategic implementation of EHR systems has proven beneficial across several critical areas of healthcare delivery. First, in terms of clinical quality, EHRs have been shown to reduce medication errors by 20–30% and enhance adherence to standardised treatment protocols (Prasad, 2025). Second, regarding operational efficiency, automation of tasks such as billing, record retrieval, and appointment scheduling can lower administrative burdens by as much as 60% (Agarwal et al., 2022). Third, for public health surveillance, integrated EHRs enable real-time disease monitoring and predictive analytics, supporting proactive public health responses (Keesara, Jones & Schulman, 2020; Musakuro & Gie, 2025).

Within resource-constrained environments, EHR systems offer significant opportunities to enhance healthcare accessibility, particularly for patients in remote and underserved areas (Simbini et al., 2025; Sylla, Ismaila & Diallo, 2025). EHR systems reduce administrative burdens, improve digital record keeping, and enable healthcare professionals to devote more time to patient care (Cresswell et al., 2019; Ogundaini & Mlitwa, 2024). In addition, they strengthen the efficiency of clinical workflows and support the integration of diverse health services, thereby contributing to more coordinated care (Scott & Mars, 2015; NDoH, 2019). Taken together, these benefits position EHRs as a critical foundation for advancing equitable and sustainable healthcare delivery.

As the healthcare landscape continues to evolve with digital innovations, EHR solutions provide a pathway to more efficient, accessible, and sustainable healthcare for diverse

communities (WHO, 2023; Musakuro & Gie, 2025). Beyond digitising manual administrative processes, EHR adoption supports broader eHealth integration, helping to mitigate specialist shortages and strengthen the long-term management of chronic illnesses, such as diabetes and HIV, in which coordinated, continuous care is essential (Benatar, Gill & Bakker, 2022). The successful implementation of EHRs, therefore, acts as a strategic enabler for more responsive, equitable, and sustainable healthcare, particularly within resource-constrained private hospitals. This aligns directly with South Africa's National Digital Health Strategy (2019–2024), which emphasises interoperability, patient-centred care, and integrated digital health records (NDoH, 2019).

While EHRs offer transformative opportunities for improving healthcare delivery, their adoption in semi-urban hospitals is shaped by a range of contextual challenges. These challenges must be critically examined to understand how resource constraints, workforce readiness, and institutional dynamics influence the success of DT initiatives.

2.5 Contextual challenges to electronic health record adoption in semi-urban healthcare environments

Despite their potential, EHR adoption in semi-urban healthcare environments faces significant barriers. Financial constraints weigh heavily, with the NDoH (2022) estimating average implementation costs of R4.2 million per hospital. Integration issues, cybersecurity risks, and the continual need for staff training and technical support compound these challenges (WHO, 2023). Infrastructural challenges further hinder adoption (Zharima, Griffiths & Goudge, 2023; Khumalo & Moloi, 2025). These include limited and unstable internet connectivity, frequent power outages, and insufficient Information Technology (IT) infrastructure.

Technological infrastructure and digital readiness also remain significant obstacles. The Health Professions Council of South Africa (2023) reports that only 58% of South African private hospitals meet the connectivity standards necessary for cloud-based systems. System interoperability challenges and outdated digital platforms also impede adoption (Tsegaye & Flowerday, 2021; Casanova, Villa-Garzon & Branch-Bedoya, 2025). Workforce-related barriers include insufficient digital literacy among healthcare professionals, organisational resistance to change, and inadequate training, which often lead to workflow disruptions and hinder integration into routine clinical practice

(Bingham, Rossi & Truong, 2022; Otto et al., 2023; Longhini, Rossettini & Palese, 2024). Regulatory challenges add further complexity, particularly in institutions lacking adequate data governance structures to comply with POPIA (Staunton et al., 2021; Information Regulator of South Africa, 2023). Large-scale implementations are often impeded by standardisation difficulties and limited ICT capacity (World Bank, 2024b).

Five critical challenges consistently highlighted in the literature are particularly pertinent to semi-urban healthcare settings:

- **Technological infrastructure and readiness:** Digital systems often fail in environments where hardware, software, or internet connectivity are unreliable (Otto et al., 2023; Khumalo & Moloi, 2025).
- **Training and digital literacy:** A lack of staff training and limited digital competence remain key barriers to effective implementation (Nguyen et al., 2024; Mabaso, Mokonyama & Mitonga-Monga, 2025).
- **Regulatory and policy environment:** Fragmented regulatory frameworks and slow-moving policy reform hinder scalable integration (Ogundaini & Mlitwa, 2024).
- **Perceived value and acceptance:** Adoption often hinges on whether healthcare workers believe the technology will genuinely improve care delivery (Venkatesh et al., 2003; Musakuro & Gie, 2025).
- **Pre-implementation feasibility assessments:** Though limited in South Africa, such assessments are essential for evaluating organisational readiness and predicting adoption success (Seward, et al., 2021; Bingham, Rossi & Truong, 2022; Zharima, Griffiths & Goudge, 2023).

A thorough grasp of these factors is essential for effective eHealth implementation. If left unaddressed, they are likely to compromise the long-term viability of digital health technologies, limiting their impact on patient care and healthcare efficiency. Adoption readiness, therefore, becomes a critical determinant of success. Evidence from technology acceptance research shows that successful implementation hinges not only on technological deployment but also on user acceptance, organisational preparedness, and system usability, as demonstrated in studies of adoption models (Venkatesh et al., 2003) and usability frameworks (Otto et al., 2023). This highlights that readiness is as

much about people and institutions as it is about technology.

Although national policy momentum has grown, frameworks such as the National eHealth Strategy (2012/13–2016/17) and the National Digital Health Strategy (2019–2024) illustrate South Africa's commitment to DT (NDoH, 2012; 2019). Yet most published studies remain concentrated in public and rural settings. Research on semi-urban private hospitals is limited; existing work shows how infrastructure volatility and interoperability gaps intersect with mixed digital literacy and affordability pressures, as highlighted in empirical studies of adoption readiness (Seward, et al., 2021; Zharima, Griffiths & Goudge, 2023). Broader analyses of governance point to POPIA-related compliance requirements and fragmented regulatory frameworks (Ogundaini & Mlitwa, 2024), while evaluations of system readiness emphasise uneven digital capacity and organisational constraints (Staunton, Slokenberga & Mascalzoni, 2022; Khumalo & Moloi, 2025). These findings underscore the need for context-sensitive strategies that address semi-urban realities rather than relying solely on lessons from rural or metropolitan settings.

2.6 Theoretical Foundations of eHealth Adoption

The adoption of eHealth in healthcare settings requires a structured theoretical approach to understand the key influencing factors. In semi-urban private hospitals, where infrastructure limitations, financial constraints, and workforce readiness present significant challenges, applying established theoretical frameworks provides a foundation for developing effective adoption strategies.

The current study drew upon five well-established eHealth adoption theories and models that have proven empirically valuable in guiding the implementation of technology within healthcare systems. These theories and models were chosen based on their ability to support pre-implementation assessments and address various factors influencing adoption (technological, organisational, and individual), as well as their relevance in resource-constrained and semi-urban settings (Gagnon et al., 2012; Lovemore, 2024). The technology acceptance model (TAM) (Davis, 1989) and the unified theory of acceptance and use of technology (UTAUT) (Venkatesh et al., 2003) provide valuable insights into healthcare professionals' attitudes and intentions toward adopting digital systems. The diffusions of innovations (DOI) theory (Rogers, 2003)

explains how new technologies gain traction within institutions, while the telehealth readiness model (TRM) (Jennett et al., 2003) offers a framework for assessing the readiness of infrastructure and organisational structures. Finally, the connected health model (Caulfield & Donnelly, 2013) introduces a patient-centred perspective, emphasising the significance of interoperability and care integration. By combining these models, a context-sensitive framework was developed, tailored to the specific circumstances of the participating semi-urban private hospital in Soshanguve. This framework provides strategic guidance for effective eHealth adoption.

2.6.1 Technology acceptance model

TAM, developed by Davis (1989), suggests that two factors primarily influence technology adoption: perceived usefulness and perceived ease-of-use. Perceived usefulness refers to the extent to which healthcare professionals believe that eHealth enhances their ability to provide care efficiently and improve patient outcomes. Perceived ease-of-use relates to how effortless healthcare professionals perceive learning and integrating eHealth solutions into their daily workflows to be.

In the context of the participating semi-urban private hospital, TAM provided a useful framework for understanding healthcare professionals' willingness to adopt eHealth solutions. Positive past experiences with digital health tools can increase adoption rates. At the same time, limited usability, system complexity, and inadequate training may create resistance to adoption (Venkatesh et al., 2003; Gagnon et al., 2012). Ensuring that eHealth systems are user-friendly and supported by comprehensive training programmes can significantly improve uptake by reducing perceived difficulty.

Despite its usefulness, TAM has limitations as it focuses primarily on individual perceptions and overlooks broader institutional and external influences. Factors such as organisational leadership, regulatory policies, infrastructure readiness, and financial constraints are critical in semi-urban healthcare environments but are not adequately addressed by TAM alone (Rahimi et al., 2018). Additionally, studies indicate that TAM does not fully capture the influence of social and environmental factors, which are often essential for large-scale technology adoption in healthcare settings (Ross et al., 2016). Recognising these broader determinants highlights the need for more comprehensive frameworks when analysing adoption dynamics.

2.6.2 Unified theory of acceptance and use of technology

UTAUT, developed by Venkatesh et al. (2003), builds on TAM by introducing key factors that influence technology adoption: performance expectancy, effort expectancy, social influence, and facilitating conditions. Performance expectancy relates to how well eHealth improves patient care and efficiency, while effort expectancy refers to the ease of learning and using digital health tools (Venkatesh et al., 2003; Rahimi et al., 2018). Social influence emphasises the role of leadership, peer recommendations, and facilitating conditions such as infrastructure, training, and IT support (Gagnon et al., 2012; Ross et al., 2016). Ensuring these elements are in place can significantly strengthen adoption and long-term engagement with eHealth systems.

In the context of the participating private hospital, UTAUT was applied to assess how key factors shape eHealth adoption. The model suggests that healthcare professionals are more likely to embrace eHealth when they perceive clear and tangible benefits. Adoption, however, can be hindered by limited training, poor system usability, or weak institutional support (Venkatesh, Thong & Xu, 2012; Ghiwaa et al., 2023). These dynamics highlight the importance of aligning technological design with organisational capacity and user readiness to ensure sustainable implementation.

Despite its strengths, UTAUT has been primarily applied in urban healthcare settings, with limited research on semi-urban environments where challenges such as unstable internet access, funding limitations, and policy constraints are crucial (Bashshur et al., 2016; Otto et al., 2023). Given these limitations, integrating UTAUT with models, such as TRM, offered a more comprehensive framework for eHealth adoption in resource-limited settings.

2.6.3 Diffusion of innovation theory

The DOI theory, developed by Rogers (2003), explains how new technologies spread within organisations based on five attributes. The first attribute, relative advantage, refers to the perceived benefits of eHealth over traditional practices. The second attribute is compatibility, which assesses how well it aligns with existing workflows. Complexity is the third attribute and relates to the difficulty of implementation and maintenance, with greater complexity slowing adoption. The fourth attribute of trialability allows healthcare providers to test eHealth solutions before committing to full-scale adoption.

Observability, as the fifth attribute, highlights the visibility of positive outcomes and thereby encourages broader implementation (Rogers, 2003; Rahimi et al., 2018). Together, these attributes underscore how incremental testing and visible success can drive confidence in eHealth adoption.

In semi-urban private hospitals, such as the participating Soshanguve hospital, the DOI theory helps to explain why eHealth adoption varies. Adoption is more likely when healthcare professionals perceive clear advantages and minimal workflow disruptions (Bashshur et al., 2016; Ross et al., 2016). However, factors such as financial constraints, infrastructure limitations, and regulatory barriers can slow diffusion.

While the DOI theory effectively describes initial adoption trends, it does not address long-term sustainability, and many semi-urban private hospitals face challenges such as financial limitations, policy constraints, and digital literacy gaps, which the DOI theory does not fully consider (Gagnon et al., 2012; Otto et al., 2023). Integrating the DOI theory with models such as UTAUT or TRM provided a more comprehensive framework for understanding adoption and long-term eHealth integration in resource-limited settings.

2.6.4 Telehealth readiness model

TRM, developed by Jennett et al. (2003), evaluates an institution's preparedness for eHealth implementation across three key dimensions: technological readiness, human resource readiness, and organisational readiness. Technological readiness assesses the availability of secure internet connectivity, compatible devices, and system interoperability, which are critical for seamless digital integration (Otto et al., 2023). Human resource readiness focuses on healthcare professionals' digital literacy, willingness, and training levels, determining their capacity to adopt and effectively use eHealth technologies (Gagnon et al., 2012). Organisational readiness encompasses leadership commitment, policy frameworks, and investment in eHealth infrastructure (Ross et al., 2016). Ensuring these elements are in place provides the institutional support needed for long-term sustainability.

In the context of the participating semi-urban private hospital in Soshanguve, TRM provided a structured approach to assessing potential barriers to eHealth adoption. Evaluating staff digital competency helped to determine training requirements before

large-scale implementation. Additionally, leadership support and regulatory alignment are crucial to sustaining eHealth initiatives and ensuring compliance with healthcare standards (Bashshur et al., 2016; Wallis et al., 2021). Without institutional backing, adoption efforts may face resistance or inefficiencies.

While TRM provides a valuable framework for assessing institutional readiness, it does not fully address financial constraints and regulatory challenges, which are significant barriers in resource-limited healthcare environments (Praha et al., 2024). Many semi-urban hospitals face budget limitations, making it difficult to invest in infrastructure upgrades, ongoing training, and cybersecurity measures (Rahimi et al., 2018). Additionally, TRM does not consider policy misalignment and fragmented regulatory frameworks, which can slow adoption (Otto et al., 2023). Integrating TRM with models, such as UTAUT or the DOI theory, further supported a more holistic perspective by accounting for financial, policy, and behavioural influences on eHealth adoption.

2.6.5 Connected health model

CHM, developed by Caulfield and Donnelly (2013), emphasises the seamless integration of digital health technologies to enhance healthcare accessibility, efficiency, and patient engagement. The model focuses on three key elements: interoperability, remote patient engagement, and data-driven decision-making. Interoperability ensures that eHealth systems integrate effectively with EHRs, enabling a streamlined exchange of patient information across platforms. Remote patient engagement leverages mHealth applications, video consultations, and AI-powered diagnostics to facilitate virtual healthcare services. Data-driven decision-making incorporates big data analytics and automation to improve clinical outcomes, optimise resource allocation, and support evidence-based medical practices (Caulfield & Donnelly, 2013; Rahimi et al., 2018). By embedding these capabilities into healthcare systems, organisations can strengthen efficiency and enhance the quality of patient care.

In private semi-urban healthcare settings, such as the participating hospital in Soshanguve, CHM provides a scalable approach to improving digital healthcare infrastructure. However, its success depends on reliable internet connectivity, digital literacy among patients and providers, and supportive policies (Ross et al., 2016). While CHM offers a comprehensive vision for connected healthcare, its implementation in

semi-urban areas is often hindered by infrastructure limitations, low smartphone penetration, and digital literacy challenges (Wallis et al., 2021; Otto et al., 2023). Additionally, AI-driven healthcare solutions face concerns regarding data security, patient privacy, and regulatory compliance, which can slow adoption (Gagnon et al., 2012; Bashshur et al., 2016). Addressing these challenges requires targeted investments in network infrastructure, digital literacy programmes, and regulatory frameworks to ensure the sustainable integration of connected health technologies.

2.7 Conceptual model of eHealth adoption factors

To place the theoretical foundations of eHealth adoption (TAM, UTAUT, TRM, the DOI theory, and CHM) within the context of the participating hospital, a conceptual model of eHealth adoption factors was developed. The first step in developing the model was to consolidate the adoption factors identified in the literature into a list of 20 *theoretical adoption factors*. Table 2.1 reflects these factors, along with each factor's accepted definition.

Table 2.1 Summary of 20 theoretical adoption factors contained in the theoretical framework of the study

No.	Name of theory or model	Brief description of the theory or model	Theoretical adoption factors identified in the literature	Definition for each theoretical adoption factor	Reference
1.	TAM	Examines how user perceptions influence technology adoption.	• Perceived usefulness • Perceived ease-of-use	**Perceived usefulness:** The belief that using eHealth technologies will enhance job performance. **Perceived ease-of-use:** The belief that eHealth systems can be operated with minimal effort.	Davis (1989)
2.	UTAUT	Evaluates technology adoption based on expectations, effort, and external influences.	• Performance expectancy • Effort expectancy • Social influence • Facilitating conditions	**Performance expectancy:** The anticipated benefits of using eHealth technologies to enhance job performance **Effort expectancy:** The perceived ease associated with learning and using eHealth systems. **Social influence:** The extent to which individuals perceive that important stakeholders believe eHealth should be adopted. **Facilitating conditions:** The belief that adequate organisational and technical support is available to enable eHealth use.	Venkatesh et al. (2003)
3.	TRM	Assesses institutional readiness for telehealth services.	• Technological infrastructure • Digital health literacy • Organisational support • Policy and regulatory compliance • Financial resources • Staff training and competence	**Technological infrastructure:** The presence of essential digital tools and connectivity required for successful implementation. **Digital health literacy:** The ability of healthcare professionals to effectively navigate and utilise eHealth systems. **Organisational support:** Institutional commitment, including leadership engagement and strategic backing. **Policy and regulatory compliance:** Ensures that eHealth adoption aligns with existing laws, standards, and ethical requirements. **Financial resources:** The availability of funding necessary for acquiring, deploying, and sustaining digital health solutions. **Staff training and competence:** The provision of adequate training programmes to equip personnel with the necessary skills.	Jennett et al. (2003)

No.	Name of theory or model	Brief description of the theory or model	Theoretical adoption factors identified in the literature	Definition for each theoretical adoption factor	Reference
4.	The DOI theory	Explains how innovations spread within an organisation or community.	• Relative advantage • Compatibility • Complexity • Trialability	**Relative advantage:** The perceived improvements of eHealth over traditional practices. **Compatibility:** How well eHealth aligns with existing workflows and clinical routines. **Complexity:** The perceived level of difficulty in using and managing eHealth technologies. **Trialability:** The ability to test and evaluate eHealth systems before full-scale implementation.	Rogers (2003)
5.	CHM	Focuses on the integration of health information technology and system interoperability.	• Patient-centred care • Defined healthcare pathway • Health information technology • Health data sharing	**Patient-centred care:** Designing digital health services that prioritise individual patient needs and preferences. **Defined healthcare pathway:** A structured patient journey supported by digital interventions and tools. **Health information technology:** Encompasses digital systems, such as EHRs, used to support clinical care. **Health data sharing:** The secure exchange of patient information across digital platforms to facilitate coordinated care.	Caulfield and Donnelly (2013)

CHM: connected health model; DOI: diffusion of innovations; eHealth: electronic health; EHR: electronic health record; TAM: technology acceptance model; TRM: telehealth readiness model; UTAUT: unified theory of acceptance and use of technology

Following the extraction of an initial list of 20 *theoretical adoption factors* from the theoretical foundations of the study, each factor was systematically assessed to determine its relevance to the study context. To ensure contextual fit, the eHealth adoption factor evaluation and selection process applied three key criteria: 1) the factor must be appropriate for the realities of a semi-urban hospital; 2) the factor must be relevant to the pre-implementation phase of eHealth transformation; and 3) the factor must be observable or assessable by hospital leadership during the pre-implementation phase of an EHR system. Those factors deemed applicable to the participating hospital context were designated as *potential adoption factors*. This targeted selection process enabled the identification of context-specific barriers, resource requirements, and strategic considerations likely to influence the adoption and support of sustainable EHRs integration within the participating hospital. The rationale for the inclusion and exclusion of each *theoretical adoption factor* is summarised in Table 2.2.

Table 2.2 Evaluation results of the theoretical adoption factors, identifying six potential adoption factors relevant to the participating hospital

No.	Theoretical adoption factors from the theoretical foundation	Existing definition of each *theoretical adoption factor*	Is the factor relevant to context of this study?	Rationale for *theoretical adoption factor* inclusion/exclusion
1.	Perceived ease-of-use	The belief that eHealth systems can be operated with minimal effort.	No	The assessment cannot be conducted before the implementation of the EHR system.
2.	Perceived usefulness	The belief that using eHealth technologies will enhance job performance.	Yes	Factor can be meaningfully explored pre-implementation through staff expectations regarding efficiency, accuracy, and care quality improvements.
3.	Performance expectancy	The belief that the system will result in performance improvements.	No	Although theoretically measurable pre-implementation, the factor overlaps conceptually with perceived usefulness. To avoid redundancy, its explanatory role is captured through usefulness and staff training and competence.
4.	Effort expectancy	The belief that the system will be easy to learn and use.	No	The EHR system's user-friendliness cannot be assessed before its implementation.
5.	Social influence	The perception that colleagues, supervisors, or leadership figures encourage and support the adoption of a new system.	Yes	The influence of workplace relationships and leadership dynamics can be probed to understand the expected influence on potential adoption of an EHR system.

No.	Theoretical adoption factors from the theoretical foundation	Existing definition of each *theoretical adoption factor*	Is the factor relevant to context of this study?	Rationale for *theoretical adoption factor* inclusion/exclusion
6.	Facilitating conditions	The perception that the organisation provides sufficient technical infrastructure and support to enable successful system use.	Yes	Evaluating organisational and infrastructure readiness is crucial before deploying an EHR system.
7.	Technological infrastructure	The availability and reliability of digital tools, internet connectivity, and system compatibility within the hospital environment.	Yes	Identifying existing technical constraints is crucial for ensuring the successful implementation of an EHR system.
8.	Digital health literacy	To what extent can staff utilise digital health tools effectively.	No	The factor reflects current capability rather than adoption potential. Readiness for capability development is more appropriately captured through staff training and competence.
9.	Organisational support	Perceived support from hospital leadership and policies that promote the adoption of eHealth technologies.	No	Conceptually distinct from peer-related social influence, but largely overlaps with facilitating conditions at the institutional level.
10.	Policy and regulatory compliance	The ability to comply with data protection and health information technology legislation.	No	Regulatory compliance does not apply to study participants, rather it is relevant at the institutional and legal review levels.
11.	Financial resources	The availability of funding for acquiring, training, and maintaining the system.	No	Factor evaluation requires financial reporting beyond the scope of this study.

No.	Theoretical adoption factors from the theoretical foundation	Existing definition of each *theoretical adoption factor*	Is the factor relevant to context of this study?	Rationale for *theoretical adoption factor* inclusion/exclusion
12.	Staff training and competence	The extent to which staff feel adequately trained to use eHealth technologies effectively.	Yes	Directly shapes confidence and readiness and operationalises performance expectancy in a pre-implementation context.
13.	Relative advantage	The perceived improvements of eHealth over traditional practices.	No	Overlaps conceptually with perceived usefulness and is difficult to assess pre-implementation.
14.	Compatibility	How well eHealth aligns with existing workflows and clinical routines.	No	Cannot be reliably assessed before workflows are adapted or system design is finalised.
15.	Complexity	The perceived level of difficulty in using and managing eHealth technologies.	No	Complexity perceptions depend on hands-on interaction with the system, which is not yet implemented.
16.	Trialability	The ability to test and evaluate eHealth systems before full-scale implementation.	Yes	Trialability provides a practical mechanism to test system functionality, reduce uncertainty, and foster adoption readiness in the pre-implementation phase.
17.	Patient-centred care	The extent to which eHealth enhances the delivery of healthcare services and patient involvement.	No	Outcome-oriented, which makes it difficult to measure before the implementation of the EHR system.
18.	Defined healthcare	The system's clarity in patient processes is supported.	No	Challenging to evaluate before the EHR system design is shared with stakeholders.

19.	Health information technology	The scope of digital tools employed in healthcare delivery.	No	Beyond the scope of the pre-implementation phase.
20.	Health data sharing	The ability to exchange information between different departments or providers.	No	Beyond the scope of pre-implementation phase as heath data sharing depends on post-implementation technical capabilities.

EHR: electronic health record

Following the systematic inclusion or exclusion of *theoretical adoption factors* contained in the study's theoretical foundations, six *potential adoption factors* were identified. To align each of these factors to the context of the participating hospital, each *potential adoption factor* was renamed and redefined to develop six *contextualised adoption factors*, specifically tailored to the unique circumstances of this study. The *contextualised adoption factor* names and definitions are presented in Table 2.3.

Table 2.3 *Potential adoption factors* renamed and redefined to develop six *contextualised adoption factors*, tailored to the unique circumstances of this study

No.	*Potential adoption factor*	*Contextualised adoption factor* name	*Contextualised adoption factor* definition
1.	Perceived Usefulness	EHR eHealth system usefulness	The extent to which healthcare professionals perceive that the planned EHR eHealth system will improve efficiency, service quality, or ease of work in a semi-urban hospital context.
2.	Facilitating conditions	Facilitating conditions	The degree to which financial resources, infrastructure, and staff training are available to support the effective adoption of an EHR eHealth system.
3.	Social influence	EHR social factors	The influence of organisational leadership, peer support, and workplace culture on healthcare professionals' openness to adopting a new EHR system.
4.	Technological infrastructure	Technological infrastructure	The hospital's overall information technology readiness for an EHR system, which includes the availability and reliability of hardware, software, and network systems required for successful implementation.
5.	Staff training and competence	Staff training	The extent to which healthcare staff perceive that they can be adequately trained and supported to develop the skills and confidence needed to use an EHR system.
6.	Trialability	Trialability	The ability for staff or decision-makers to trial or test the EHR system before full implementation so that feasibility and fit can be assessed.

eHealth: electronic health; EHR: electronic health record

Finally, the six *contextualised adoption factors* were categorised into three influencing factors: system-centric, institution-centric, and people-centric. The system-centric category focused on how stakeholders perceive the eHealth solution. The institution-centric factors assessed the hospital's structural and operational capabilities. The people-centric factors captured the cultural and leadership dynamics that influence staff engagement. This categorisation further guided a targeted evaluation of the elements that can facilitate or hinder successful EHR implementation in the participating hospital. Table 2.4 presents the categories and assigned *contextualised adoption factors* for each category.

Table 2.4 Categorisation of contextualised adoption factors

No.	*Contextualised adoption factor* for Soshanguve context	*Contextualised adoption factor* definition in the context of this study	Categorisation of *contextualised adoption factors*
1.	EHR eHealth system usefulness	The extent to which healthcare professionals perceive that the planned EHR eHealth system will improve efficiency, service quality, or ease of work in a semi-urban private hospital context.	Category 1: System-centric factors influencing EHR adoption potential.
2.	Facilitating conditions	The degree to which financial resources, infrastructure, and staff training are available to support the effective adoption of an EHR eHealth system.	Category 2: Institution-centric factors influencing EHR adoption potential.
3.	EHR social factors	The influence of organisational leadership, peer support, and workplace culture on healthcare professionals' openness to adopting a new EHR system.	Category 3: People-centric factors influencing EHR adoption potential.
4.	Technological infrastructure	The hospital's overall information technology readiness for an EHR system, which includes the availability and reliability of hardware, software, and network systems required for successful implementation.	Category 2: Institution-centric factors influencing EHR adoption potential.
5.	Staff training	The extent to which healthcare staff perceive that they can be adequately trained and supported to develop the skills and confidence needed to use an EHR system.	Category 2: Institution-centric factors influencing EHR adoption potential.
6.	Trialability	The ability for staff or decision-makers to trial or test the EHR system before full implementation so that feasibility and fit can be assessed.	Category 1: System-centric factors influencing EHR adoption potential.

eHealth: electronic health; EHR: electronic health record

Category 1: System-centric adoption factors

System-centric factors pertain to the perception of the eHealth system's performance and value. This domain comprises two fundamental elements: the *usefulness* of the eHealth system and its *trialability*. Usefulness refers to the extent to which healthcare professionals believe that the system will enhance clinical efficiency, service quality, and workflow (Davis, 1989; Venkatesh et al., 2003). Trialability, on the other hand, encompasses the opportunity for staff to test the system before its full deployment, thereby increasing their confidence in its suitability and purpose fit (Rogers, 2003). These factors provide early indications of anticipated benefits and potential reservations, enabling targeted engagement before implementation.

Category 2: Institution-centric adoption factors

Institution-centric factors reflect the hospital's operational and infrastructural readiness to support DT. This encompasses *facilitating conditions*, *technological infrastructure*, and *staff training*. Facilitating conditions assess the availability of financial, managerial, and training support for the adoption of eHealth (Venkatesh et al., 2003). Technological infrastructure evaluates the adequacy of hardware, software, and network systems (Jennett et al., 2003). Staff training examines whether personnel have the digital skills necessary for successful system usage (Herselman & Ruxwana, 2019). These elements collectively assess the hospital's capacity to sustain the integration of eHealth.

Category 3: People-centric adoption factors

People-centric factors examine the social and behavioural environment that influences adoption. The primary focus is on *social factors influencing adoption potential*, which refers to the impact of leadership, peer support, and institutional culture on staff receptiveness to digital change. Interpersonal encouragement and supportive organisational culture are crucial for fostering engagement with new technologies (Greenhalgh et al., 2017; Topol, 2019). Analysing these factors provides valuable insights into morale, leadership dynamics, and social reinforcement mechanisms.

2.7.1 Conceptual model of electronic health records system adoption potential

Contextualising and categorising potential EHR adoption factors across system, institutional, and people domains enabled the development of a conceptual model for comprehensive assessment of pre-implementation eHealth adoption potential. By

considering adoption not only in terms of technology but also the hospital's organisational capacity and the willingness of healthcare professionals to embrace change, the model provided a contextually relevant basis for engaging staff from the participating semi-urban private hospital on the factors most likely to influence their adoption of a new EHR system. Figure 2.1 presents the conceptual model, considering the three categories of contextualised EHR adoption factors.

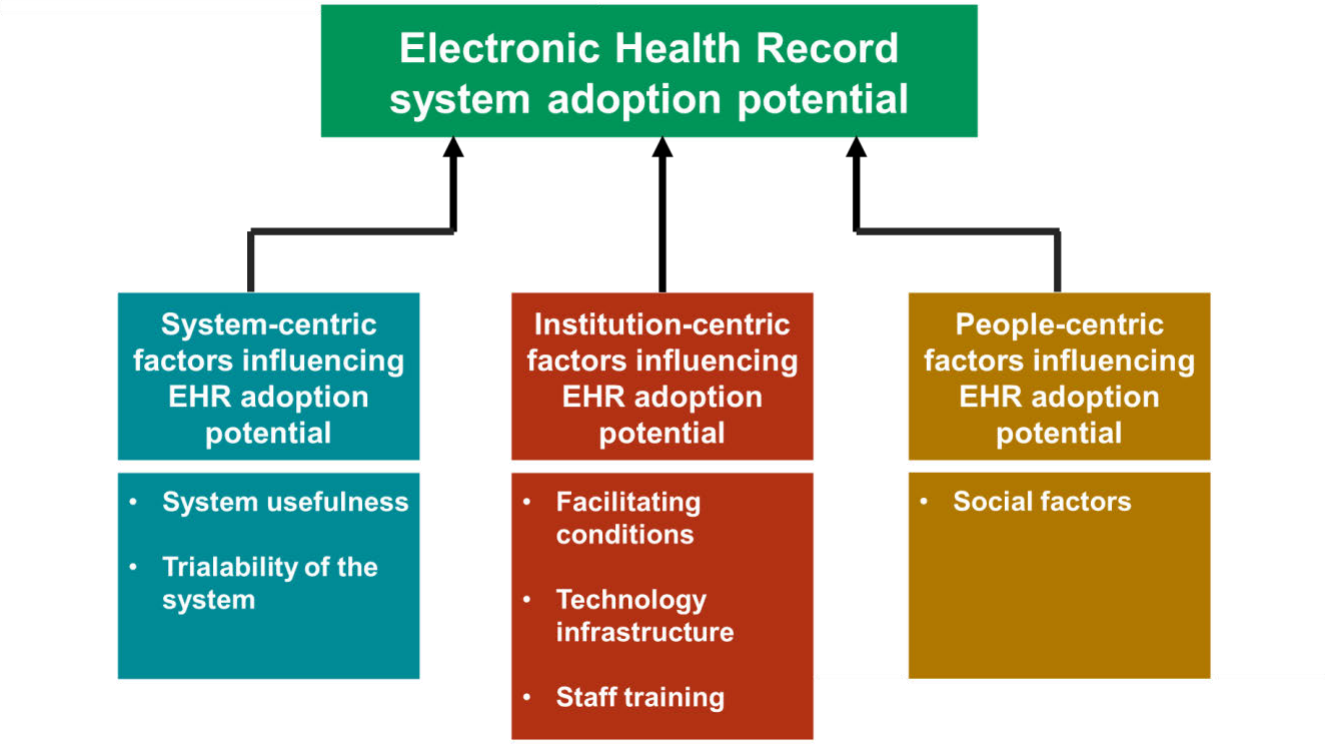


Figure 2.1 Conceptual model of contextualised adoption factors that may influence electronic health record adoption in a semi-urban private hospital in Soshanguve

EHR: electronic health record

This structured categorisation offered a context-sensitive foundation for empirical inquiry. The domains and their associated factors directly informed the design of the interview schedule used during data collection, ensuring that theoretical constructs were translated into practical prompts. As a result, each conversation with healthcare professionals in the participating semi-urban private hospital was firmly anchored in the conceptual model developed for the Soshanguve context. Aligning theory with method in this way enabled a focused exploration of the conditions, perceptions, and institutional

dynamics most likely to affect EHR adoption, thereby strengthening both the validity and the contextual relevance of the findings presented in Chapter 4.

2.8 Conclusion

This literature review has critically examined the multifaceted landscape of eHealth adoption, with particular emphasis on South Africa's semi-urban private healthcare sector. The review underscores that successful implementation of eHealth systems extends beyond technology deployment; it requires a nuanced understanding of local conditions, including infrastructural limitations, workforce preparedness, financial viability, and alignment with national policy frameworks. These factors are especially salient in semi-urban private contexts such as Soshanguve, where healthcare institutions operate within hybrid service environments marked by resource constraints and diverse patient needs.

To address these complexities, the study drew on five foundational models of technology adoption: TAM, UTAUT, the DOI theory, TRM, and CHM. Each framework contributes distinct insights into the technological, organisational, and human dimensions of eHealth adoption. Their combined application enabled the development of a robust, context-sensitive conceptual model tailored to the participating hospital. This model explicitly accounts for the institution's infrastructural volatility, financial constraints, workforce capacity, and patient engagement priorities, guiding the formulation of targeted adoption strategies.

The gap identified in the literature, namely the lack of context-specific, institution-level assessments of eHealth adoption readiness in semi-urban private hospitals, forms the basis for this study. In Chapter 3, the theoretical framework established here is expanded, positioning the selected models within the study design and demonstrating how they informed the investigation of EHR adoption determinants in Soshanguve. By linking theory to practice, how insights from the literature and conceptual models translate into actionable strategies for DT are outlined. Understanding these factors within the semi-urban private and resource-constrained environment of Soshanguve will enable hospital decision-makers to develop targeted, evidence-based interventions that support sustainable eHealth adoption and align with the broader goals of South Africa's healthcare system.

Chapter 3
Research Methodology

3.1 Introduction

The adoption of electronic health record (EHR) systems in healthcare settings has become a crucial focus due to their potential to enhance patient care, improve accessibility, and streamline clinical workflows. Despite these advantages, the adoption of such systems remains inconsistent, particularly in semi-urban private healthcare environments where factors such as technological infrastructure, digital literacy, and institutional readiness vary. The aim of this study was to identify key factors influencing EHR system adoption potential among healthcare professionals at a semi-urban private hospital in Soshanguve. Existing technology adoption theories and models provide valuable insights into strategies for improved levels of eHealth adoption among healthcare professionals (Greenhalgh et al., 2017, 2023). However, these measures do not, in isolation, fully address infrastructure limitations, financial constraints, regulatory barriers, or digital literacy gaps (Zharima, Griffiths & Goudge, 2023; Mabaso, Mokonyama & Mitonga-Monga, 2025; Musakuro & Gie, 2025). Such factors remain critical to the success of electronic health (eHealth) technology in a resource-limited semi-urban private hospital.

Driving the adoption of eHealth in the participating private hospital in Soshanguve required a structured theoretical approach to assess whether the institution had the necessary conditions to support successful implementation. In this study, influencing factors were identified in the context of eHealth adoption potential before system implementation. At this early stage, no specific software had been introduced, and the participants (nurses, doctors, allied healthcare workers, departmental managers, and hospital executives) were not evaluating an existing platform but rather contributing insights into potential adoption. The purpose was to assess implementation feasibility, gauge institutional and individual readiness, and identify the necessary support structures for successful integration. The application of established eHealth adoption theoretical foundations was, therefore, adjusted to the EHR pre-implementation phase in a semi-urban private hospital to provide a conceptual model that integrates and aligns key factors from these established eHealth adoption theories.

3.2 Philosophical foundation

Philosophical inquiry is grounded in three fundamental domains: epistemology, ontology, and axiology. These domains collectively shape understandings of knowledge, reality, and values (Guba & Lincoln, 2008). Epistemology, in particular, focuses on the nature and scope of knowledge, examining how knowledge is constructed, beliefs are justified, and the limits of human understanding (Cohen, Manion & Morrison, 2018). Ontology addresses questions of existence and reality by exploring the nature and structure of what entities exist and how they relate to one another within a given context. (Scotland, 2012; Grass, 2024). Axiology, meanwhile, focuses on values, encompassing both ethics and aesthetics, and considers what is good, right, or meaningful (Saunders, Lewis & Thornhill, 2019). These philosophical dimensions are not merely abstract (Creswell & Creswell, 2018; Creswell & Poth, 2018). Rather, they play a critical role in guiding research design, shaping methodological choices, informing ethical considerations, and framing the interpretation of findings.

This study adopted an interpretivist paradigm, aligned with a relativist ontology, a subjectivist epistemology, and a value-laden axiology. According to interpretivism, people's lived experiences and interpretations of occurrences are the greatest ways to comprehend reality, which is socially constructed (Crotty, 1998; Creswell & Poth, 2024; Saunders, Lewis & Thornhill, 2025). Within the context of eHealth adoption, this paradigm enabled the researcher to explore how healthcare professionals perceive, interpret, and respond to the introduction of EHR systems in their specific institutional and cultural environment (Chalmers, Manley & Wasserman, 2009; Wiesche, et al., 2017; Mogaji, Jain & Sharma, 2024). By prioritising subjective insights and contextual understanding, the study applied an interpretivist paradigm to explore the nuanced factors shaping adoption readiness in the semi-urban private hospital setting (Greenhalgh et al., 2023; Nilsen & Birken, 2025). This approach highlights how context-sensitive perspectives can reveal the complex dynamics influencing eHealth implementation.

Ontology

The ontological stance is relativist, recognising that multiple realities exist, shaped by individual experiences, roles, and contexts (Guba & Lincoln, 1994; Denzin & Lincoln, 2017). The study did not seek a singular, objective truth about eHealth adoption but

rather aimed to uncover diverse practitioner perspectives within a semi-urban private hospital environment.

Epistemology

A constructivist epistemological position asserts that knowledge is socially constructed through interaction, dialogue, and interpretation (Creswell & Poth, 2018; Denzin et al., 2024). By engaging with participants, the study co-constructed an understanding of the factors influencing EHR adoption, recognising that this knowledge is inherently context-dependent and shaped by the perspectives, experiences, and interactions of both the researcher and what is researched (Tracy, 2020; Braun & Clarke, 2022).

Axiology

Interpretivist research embraces the value-laden nature of inquiry, recognising that the researcher's background, interests, and ethical commitments influence the research process (Mertens, 2015; Saunders, Lewis & Thornhill, 2019). This study valued empathy, reflexivity, and respect for the participants' narratives, ensuring that the findings authentically reflect the voices of healthcare practitioners.

3.3 Methodological approach

Qualitative research generates predominantly unstructured, text-based data, such as interview transcripts, observation notes, diaries, or medical records, though it may also include images, audio, or video (Braun & Clarke, 2024; Creswell & Poth, 2024). Unlike quantitative research, which relies on statistical methods, qualitative inquiry seeks to explore values, meanings, beliefs, experiences, and feelings (Denzin et al., 2024; Saunders, Lewis & Thornhill, 2025). Qualitative analysis is a dynamic, inductive process of identifying patterns and building understanding rather than a purely technical exercise (Saldaña, 2021; Braun & Clarke, 2024). This approach emphasises interpretation and meaning-making as central to qualitative inquiry.

This study adopted a qualitative, interpretive case study design, well-suited for investigating complex, context-dependent phenomena such as technology adoption in healthcare settings. The semi-urban private hospital in Soshanguve served as the case through which practitioner experiences, institutional dynamics, and contextual constraints were examined. Case study methods allowed for a holistic investigation of

EHR adoption (Yin, 2018). These methods bring into consideration the interplay between individual perceptions, organisational structures, and technological readiness

An interpretivist paradigm guided the inquiry, foregrounding participants' subjective experiences, perceptions, and decision-making processes regarding eHealth adoption (Creswell & Poth, 2024; Mogaji, Jain & Sharma, 2024). Interpretivism emphasises the meanings people assign to their lived experiences and the social realities they construct, in contrast to positivist paradigms that seek generalisable facts through quantification (Denzin et al., 2024; Saunders, Lewis & Thornhill, 2025). Within this paradigm, the study engaged with complex and contextually embedded factors identified as potentially shaping adoption readiness in the participating hospital (Greenhalgh et al., 2023; Nilsen & Birken, 2025). This engagement provided deeper insight into how local conditions influence the trajectory of eHealth implementation.

The research design was further structured by a deductive reasoning approach, whereby existing technology adoption theories informed the development of research questions, interview protocols, and initial coding categories. This theoretical scaffolding provided coherence and direction, while the qualitative design retained flexibility to accommodate emergent themes and unexpected insights (Silverman, 2020). Balancing deductive and inductive reasoning ensured that the study remained grounded in established scholarship while remaining responsive to the participants' lived realities.

By capturing rich, context-specific data through semi-structured interviews, the study contributed to a deeper understanding of the institutional, technological, and human elements that affect EHR adoption in resource-limited healthcare environments (Greenhalgh et al., 2023; Musakuro & Gie, 2025). This methodological approach supported the identification of barriers and enablers that may not have been visible through quantitative surveys or experimental design contexts (Braun & Clarke, 2024; Nilsen & Birken, 2025). Practical insights could, therefore, be suggested for policy-makers, hospital administrators, and implementation teams seeking to advance digital transformation (DT) in a semi-urban private healthcare setting (WHO, 2025b; World Bank, 2024a). These insights will provide actionable guidance for strengthening readiness and driving the sustainable adoption of eHealth solutions.

Data analysis in qualitative research involves systematically organising transcripts and

other materials to reduce large volumes of information, identify significant themes, and construct a logical chain of evidence (Braun & Clarke, 2024; Creswell & Poth, 2024). Central to this process is coding, which assigns labels to segments of data to capture emerging concepts (Saldaña, 2021). While traditionally conducted manually, coding has been enhanced by computer-assisted qualitative data analysis software that improves efficiency in organising, retrieving, and managing data (Bryda & Costa, 2023; Chatzichristos, 2025). Interpretation and synthesis, however, remain the responsibility of the researcher (Denzin et al., 2024). This underscores the central role of researcher judgement in shaping meaning from qualitative data.

NVivo, developed by QSR International, was employed in this study to extend beyond simple coding and retrieval, enabling the linking, modelling, and visualisation of relationships among themes (Silver & Woolf, 2017; QSR International, 2024). Its tools supported the systematic management of complex qualitative datasets, ensuring rigorous and transparent analysis while preserving the richness of the data (Braun & Clarke, 2024). To further strengthen trustworthiness, the study employed strategies such as maintaining a detailed audit trail and engaging in peer debriefing (Noble & Smith, 2025; Saunders, Lewis & Thornhill, 2025). These measures enhanced credibility and dependability while ensuring transparency in the research process.

3.4 Conceptualisation of the study

To answer the main research question, research objectives guided the study's research process. These research objectives were addressed through three research phases, which were sequentially executed to achieve an understanding of the phenomenon of EHR adoption potential within the participating hospital. The three research phases are summarised in Table 3.1, after which, each of the phases is briefly described.

Table 3.1 Research phases, outcomes, and relevant chapters

Phase	Outcome	Chapter related to phase
Phase 1: Factor identification, contextualisation, and conceptual model design	Conceptual model of contextualised factors expected to influence EHR adoption potential among healthcare professionals in the participating private hospital	2
Phase 2: Data collection instrument development and data collection	Data collection instrument, collected interview data	4
Phase 3: Finalisation of factors influencing EHR adoption potential in the participating private hospital	Finalised set of factors influencing EHR adoption potential	5

EHR: electronic health record

3.4.1 Phase 1: Factor identification, contextualisation, and conceptual model design

In Phase 1 of the study, the theoretical foundations of eHealth discussed in Chapter 2 were applied to identify key eHealth adoption factors from the existing literature. This process resulted in 20 *theoretical adoption factors* being identified. In semi-urban private healthcare settings, various challenges such as technological limitations, financial constraints, and differing levels of digital literacy impact healthcare professionals' ability to adopt eHealth solutions (Gagnon et al., 2012; Bashshur et al., 2016). Therefore, to place the *theoretical adoption factors* within the context of the participating hospital, factors gleaned from these frameworks were considered using three guiding criteria. First, each factor needed to reflect the practical realities of a semi-urban private hospital environment. Second, it had to be pertinent to the pre-implementation stage of DT. Third, the factor was required to be visible or measurable by hospital leadership during the early phase of introducing an EHR system.

Following this inclusion or exclusion process, a list of six *potential adoption factors* was distilled, relevant to context of the participating hospital. The *potential adoption factors* were renamed and redefined to derive six *contextualised adoption* factors, each aligned specifically with the current study's context and aim. This process ensured that each factor was tailored to reflect the pre-implementation, semi-urban, and resource-

constrained healthcare setting of eHealth adoption at the participating hospital. Finally, the *contextualised adoption factors* were categorised into system-, institution-, and people-centric domains, and visualised in a conceptual model of *contextualised adoption factors* that may influence EHR adoption in the participating hospital.

3.4.2 Phase 2: Data collection instrument development, data collection, and sampling

a) Interview schedule development

In Phase 2, the conceptual model developed in Phase 1 was operationalised into a series of interview questions designed to explore healthcare professionals' perspectives of eHealth adoption across these domains. Each adoption factor was examined using five questions. The first four questions were open-ended and reflective, directly addressing the factor under consideration. The fifth question asked participants to assign a rating on a 1–10 scale (1 = weakest influence, 10 = strongest influence) to the expected impact of the factor, followed by a probe requiring participants to explain the rationale for their rating. The full set of interview questions is presented in Table 3.2.

Table 3.2 Interview questions per contextualised adoption factor

No.	*Contextualised adoption factor* for Soshanguve context	Interview questions
1.	EHR eHealth system usefulness	- To what extent, if any, do you think an EHR system could streamline your daily tasks? - In what ways, if any, do you think an EHR system could improve service quality in the hospital? - How important is ease-of-use in your willingness to adopt an EHR system? - Beyond efficiency and quality, what other features would make you more likely to use an EHR system? - On a scale of 1 to 10 (1 being the weakest and 10 being the strongest), how strongly does the perceived system usefulness of the EHR system influence your willingness to adopt it? Can you explain your rating?
2.	Trialability	- How important is it that you have the opportunity to trial the EHR system before deciding to adopt the system? - What are your expectations, if any, of what a successful test of the EHR system would entail? - Are there features specific to your hospital context that you would want to test before you decide to adopt the system?

No.	*Contextualised adoption factor* for Soshanguve context	Interview questions
		- On a scale of 1 to 10 (1 being the weakest and 10 being the strongest), how strongly would the ability to trial the EHR system influence your willingness to adopt it? Please explain your rating.
3.	Facilitating conditions	- What financial challenges, if any, do you foresee in adopting an EHR system? How could these challenges be addressed? - Does the hospital have the IT infrastructure, such as hardware and internet bandwidth, to support an EHR system? - What type of training would staff need, if any, to use the EHR system confidently? Is it feasible for the hospital to offer this type of training? - Beyond finances, infrastructure, and training, what other resources that are currently available or not available, do you know of that could influence your successful adoption of the system? (Examples could include dedicated IT support, workflows, and associated process design). - On a scale of 1 to 10 (1 being the weakest and 10 being the strongest), how prepared is the hospital to provide the resources needed for EHR adoption? What is missing?
4.	Technological infrastructure	- Are you aware of hardware limitations, if any, that would make it difficult to adopt an EHR system in your hospital? - Are you aware of any existing current software systems that would need to integrate with the new EHR system? How critical are these integrations? Are there challenges expected in achieving these integrations? - Do you know how reliable the current network infrastructure is (examples include wi-fi and wired connections) that would be needed to use the EHR system? - Other than hardware, software, and networks, do you know of any other technical infrastructures that would need to be in place to support EHR adoption? - On a scale of 1 to 10 (1 being the weakest and 10 being the strongest), how prepared is the hospital's current technological infrastructure to support a new EHR system? What is missing?
5.	Staff training	- How would access to structured training for skills development affect your openness to using an EHR system? - Are there any barriers that might prevent staff from accessing or completing EHR training? Please elaborate if barriers do exist. - How could the hospital best address varying levels of digital skills among staff when providing EHR training? - Is there additional support (e.g., mentorship, online resources, tech support) that would help you adopt an EHR system confidently? - On a scale of 1 to 10 (1 being the weakest and 10 being the strongest), how strongly does the quality of training within the hospital influence your willingness to adopt a new EHR system? Please explain your rating.

No.	*Contextualised adoption factor* for Soshanguve context	Interview questions
6.	EHR social factors	- How would you describe hospital leadership's current attitude toward EHR adoption? Can you explain what actions leadership is taking to lead you to this conclusion? - Does the hospital leadership's attitude toward digital systems affect your willingness to adopt a new EHR system? Please elaborate. - How influential are the opinions of your peers about an EHR system when deciding whether you are willing to adopt the system? - How would you describe the ways in which the hospital's culture typically responds to major changes such as new technology implementations? - Please rank these factors by how strongly each influences your adoption of a new system: leadership buy-in, peer support, cultural fit. Explain your ranking.

EHR: electronic health record, eHealth: electronic health, IT: Information Technology.

In line with Braun and Clarke's (2006, 2019) six-phase framework for thematic analysis, the use of scales in this qualitative study was not intended to produce quantitative measures but rather to structure discussion and stimulate reflection. For this reason, scale items in the interview schedule were deliberately embedded within broader open-ended questions. Participants were asked not only to provide a numerical rating but also to elaborate on the reasoning behind their choice. Across all adoption factors, scale questions were accompanied by probes such as "*What is missing?*", "*Please elaborate*", or "*Please explain your rating*", with the interviewer actively following up on responses to encourage reflection, provide examples, and explore contextual detail. This approach ensured that the scales served as entry points for generating nuanced data that extended beyond the numerical ratings, aligning the data collection instrument with the analytic framework guiding the study.

b) Data collection method

A semi-structured interview was completed with each participant to explore the six *contextualised adoption factors*, and whether the identified factors should be amended or expanded before being finalised in Phase 3. This approach facilitated an in-depth exploration of healthcare professionals' perspectives and experiences, while ensuring coherence across the central themes. Consistent with an interpretivist paradigm, it

provided the necessary flexibility for nuanced inquiry while maintaining focus on the guiding theoretical frameworks (Creswell & Poth, 2018; Silverman, 2020). Each interview lasted approximately 45 to 60 minutes. The participating hospital's management deemed this interview duration acceptable.

c) Sampling method

The unit of analysis for this study was individual healthcare professionals within the participating hospital who were directly involved in decision-making, implementation, or daily use of the envisaged EHR system (Patton, 2020). To identify suitable participants, a non-probability purposive sampling strategy was employed, focusing on professionals with prior experience or exposure to eHealth. This approach is widely recognised for selecting participants based on inclusion criteria that are directly relevant to the research objectives (Creswell & Poth, 2024). It was particularly appropriate for examining a complex and context-specific phenomenon such as the potential adoption of eHealth in semi-urban settings (Saunders, Lewis & Thornhill, 2025). By targeting individuals with specialised expertise and practical experience, purposive sampling ensured that the study captured insights most critical to understanding the factors influencing EHR adoption in the hospital context (Braun & Clarke, 2022). This approach strengthened the relevance and depth of the findings by drawing on participants' informed perspectives.

A sample of ten participants was selected to capture a range of perspectives across departments. This number represented 50% of the total population of healthcare professionals at the participating hospital, a proportion that enhances representativeness in small, bounded case study contexts (Marshall et al., 2013; Patton, 2015). Furthermore, given that this study was intended to provide analytical depth rather than statistical generalisability, data saturation in homogeneous groups can often be reached with as few as six to twelve interviews (Guest, Bunce & Johnson, 2006). The inclusion criteria for study participants were as follows:

- Participants must work in the participating hospital and have experience in eHealth-related processes, implementation, or both.
- Participants must hold decision-making, administrative, or clinical roles that are directly or indirectly involved in the adoption of eHealth.

- Participants must have varying levels of digital literacy to investigate how technical proficiency influences the usability and acceptance of eHealth solutions.

Selection was independent of demographic characteristics such as gender, age, or tenure, focusing instead on participants' experience with eHealth. Participants without exposure to eHealth systems or digital health technologies, or who work in unrelated departments with no role in healthcare delivery, administration, or IT, were excluded from this study. The composition of interviewees guaranteed balanced representation across strategic, managerial, operational, and clinical levels, providing a comprehensive understanding of eHealth adoption in the hospital. By concentrating on key stakeholders, this study ensured that data collection was relevant, context-specific, and reflective of the real-world challenges to eHealth adoption within the participating semi-urban hospital. The participant categories, number of participants, and relevant inclusion criteria are presented in Table 3.3.

Table 3.3 Sample categories of interviewees

Participant category	Number of participants	Reasons for including participant category
Hospital executives (chief executive officers, directors, or senior administrators)	2	To provide insights into strategic decision-making, financial investment, and institutional readiness for eHealth adoption.
Department managers (information technology, clinical, operations, and nursing heads)	3	To assess how eHealth integrates into hospital workflows, staff training, and policy alignment.
Nurses and allied healthcare professionals	3	To understand firsthand the challenges and benefits of eHealth in daily patient care.
Hospital administrators (human resources, records, and information technology staff	2	To evaluate digital literacy, system usability, and administrative support for eHealth solutions.

eHealth: electronic health

3.4.3 Phase 3: Data analysis and finalisation of factors influencing electronic health record adoption potential in the participating private hospital

Qualitative data analysis was conducted using NVivo 14 (QSR International), a specialised computer-assisted qualitative data analysis software (Silver & Woolf, 2017; QSR International, 2024). NVivo was selected for its ability to systematically manage, code, and analyse textual data while maintaining methodological rigour (Braun & Clarke, 2024; Chatzichristos, 2025). The software facilitated the organisation of interview transcripts, enabled coding against the conceptual model developed in Phase 1, and supported the identification of patterns and themes across respondents (Saldaña, 2021; Creswell & Poth, 2024). NVivo's word tree function was also employed to visualise how words and codes were linked, providing further insight into relationships among concepts (Silver & Woolf, 2017) (Appendix F).

All ten semi-structured interview recordings were professionally transcribed verbatim, yielding approximately 85 pages of textual data. Transcripts were reviewed for accuracy, anonymised, and respondents were identified as R1 to R10. These transcripts were imported into NVivo as internal sources, creating a project containing all textual data for analysis. Basic case classifications were created for each respondent, allowing comparative analysis across staff roles and departmental affiliations where metadata was available. Analysis was conducted independently of demographic variables such as gender, age, or tenure, with themes derived from professional experience and contextual relevance.

a) Hybrid coding process

A hybrid coding approach was employed, combining deductive and inductive elements. Deductive (a priori) coding was used to capture six parent nodes in NVivo, directly derived from the conceptual model of contextualised adoption factors established in Chapter 2. The a priori codes were: EHR eHealth system usefulness, facilitating conditions, EHR social factors, technological infrastructure, staff training, and EHR social factors. These parent nodes provided the primary organisational structure for the analysis, ensuring consistency with the research objectives.

Inductive (emergent) coding was then undertaken to allow themes to arise directly from the data. Within each parent node, child nodes were generated iteratively through close

reading of the transcripts, ensuring responsiveness to participants' perspectives and experiences. For example, under facilitating conditions, several child nodes emerged, including Financial barriers, IT infrastructure gaps, Training needs, Cybersecurity and compliance, and Workflow integration. These inductively derived categories provided a nuanced understanding of the contextual factors influencing eHealth adoption.

The coding process broadly aligned with Braun and Clarke's (2006, 2019) six-phase model, which progresses from familiarisation and initial coding to theme development, refinement, and reporting. This study followed a similar trajectory, beginning with familiarisation and broad descriptive coding, moving into detailed thematic coding, and culminating in refinement and consolidation. While Braun and Clarke (2006, 2019) emphasise reflexivity, flexibility, and the researcher's interpretive role in constructing meaning, the coding approach in this study represented a software-assisted adaptation of their thematic analysis. This adaptation combined their reflexive orientation with a more formalised, tool-driven process that enhanced traceability while preserving interpretive depth. The stages of coding were as follows:

- **Stage 1 - Initial familiarisation coding:** Each transcript was read in its entirety. Initial impressions and notable passages were documented using the memo feature, allowing reflections and observations to be captured alongside the text. Broad, descriptive coding was then applied, providing a foundation for subsequent, more detailed analysis.
- **Stage 2 - Detailed thematic coding:** Transcripts were re-examined line by line to ensure systematic analysis. Specific text segments were assigned to relevant nodes through drag-and-drop coding, with each action automatically recorded in NVivo's coding history to create a transparent audit trail. Nvivo coding was also employed when respondents' own words captured concepts with clarity or resonance, thereby preserving participants' voices within the thematic structure.
- **Stage 3 - Refinement and consolidation:** The coding framework was refined using NVivo's node hierarchy view. Similar codes were merged to reduce overlap, while redundant codes were eliminated to streamline the structure. Relationships between codes were examined, allowing connections and interdependencies to be mapped more clearly. This iterative process culminated in a final coding framework consisting of six parent nodes and thirty

child nodes, providing a coherent and comprehensive structure for the analysis.

b) Theme development and synthesis

Thematic development followed a systematic and iterative process within NVivo. Using coding query results, recurring concepts were identified within each factor, forming the foundation for deeper analysis. Related codes were grouped into candidate themes through NVivo's hierarchy and set features, allowing concepts to be organised into meaningful clusters. These themes were reviewed and refined against both coded extracts and the broader dataset, with coding stripes and text search functions ensuring consistency and accuracy. Clear definitions were established for each theme, and representative quotations were identified using NVivo's reference view to preserve respondents' voices. Finally, a concept map was generated to model the interrelationships among key themes.

3.5 Trustworthiness

Ensuring trustworthiness is essential in qualitative research, particularly within an interpretivist paradigm where findings are shaped by participants' subjective experiences and the researcher's interpretive lens. To enhance rigour, this study employed multiple strategies guided by Lincoln and Guba's (1985) criteria of credibility, transferability, dependability, and confirmability (Denzin et al., 2024; Noble & Smith, 2025; Saunders, Lewis & Thornhill, 2025). These measures reinforced the transparency and reliability of the research process.

Credibility was strengthened through prolonged engagement with the data, iterative theme analysis, and member verification. Transcripts were reviewed multiple times to ensure familiarity with participant narratives, and emerging themes were validated by returning to participants for clarification and confirmation (Braun & Clarke, 2024; Creswell & Poth, 2024). These processes helped ensure that interpretations accurately reflected participants' perspectives and reduced the risk of misrepresentation.

Transferability was addressed by providing detailed, contextual descriptions of the study setting, participant roles, and institutional dynamics. Although the findings are not statistically generalisable, the rich account of the semi-urban private hospital environment enables readers to assess the applicability of insights to similar contexts

(Braun & Clarke, 2022; Saunders, Lewis & Thornhill, 2025). This approach supported the broader relevance of the study while remaining grounded in its bounded context.

Dependability was supported by a transparent and systematic approach to data collection and analysis. An audit trail documented methodological decisions, coding iterations, and theme development, while peer debriefing challenged assumptions and enhanced analytical depth (Noble & Smith, 2025; Saunders, Lewis & Thornhill, 2025). Together, these strategies strengthened the consistency of the research process (Creswell & Poth, 2024). They also ensured that the analysis remained traceable and replicable, reinforcing methodological rigour.

Confirmability was achieved through reflexive practices, including ongoing reflection on positionality, potential biases, and the influence of prior knowledge (Braun & Clarke, 2024; Denzin et al., 2024). NVivo software further supported consistent coding and the traceability of analytic decisions. Triangulation, achieved by contrasting emerging ideas with published literature and theoretical frameworks, ensured that conclusions were both empirically grounded and theoretically coherent (Silver & Woolf, 2017; QSR International, 2024; Nilsen & Birken, 2025). These combined strategies reinforced the transparency and credibility of the analytic process.

3.6 Ethical considerations

This study adhered to recognised ethical guidelines to maintain academic integrity and safeguard participant protection throughout the research process (Bryman & Bell, 2007; Creswell & Poth, 2024; Saunders, Lewis & Thornhill, 2025):

1. **Voluntary participation and informed consent:** Participants were made aware of the objectives and intent of the study, how their data would be utilised, and that they could withdraw from the study at any time without repercussions. Written informed consent was obtained before participation.
2. **Confidentiality and privacy:** Participant identities were kept confidential. Data were securely stored and accessible only to the research team. Responses were de-identified in all reports to protect participants' privacy.
3. **Protection from harm:** The study minimised any psychological, professional, or reputational risks to participants. Questions focused on professional experiences and avoided personal or sensitive topics.

4. **Transparency and avoidance of deception:** The research did not mislead participants about its purpose. Findings were reported accurately, ensuring that interpretations remained faithful to participants' perspectives.
5. **Academic integrity:** All external sources, theories, and frameworks are properly cited and referenced to uphold academic standards.

3.7 Conclusion

Implementing eHealth in a semi-urban private hospital, particularly in a resource-limited setting such as Soshanguve, demands a context-aware and nuanced strategy. Simply introducing digital systems is insufficient without considering the intricate relationship between technological infrastructure, organisational capacity, staff readiness, and broader environmental factors. In pre-implementation contexts, where no system is yet in place, feasibility assessments and predictive modelling are crucial for guiding informed and strategic decisions. While established frameworks, such as TAM, UTAUT, the DOI theory, TRM, and CHM, offer valuable theoretical foundations, they fail to fully capture the complexities of semi-urban healthcare environments where adoption is still under consideration. These models help explain user perceptions and institutional dynamics but often overlook the contextual barriers unique to under-resourced private hospitals.

In this chapter, the methodology of the three phases of the research study was described, bringing together critical pre-implementation factors. This approach was designed to provide a targeted lens for assessing readiness and identifying key areas where EHR investment and support would be most impactful. Building on this methodological foundation, the following chapter presents the findings derived from the three research phases. By foregrounding participant perspectives, lived experiences, contextualised adoption readiness explanation, and verbatim quotations to capture meaning-making processes, the results reflect the interpretivist stance adopted in the study, providing grounded insight into the nuanced realities of eHealth pre-implementation planning. This ensures alignment between the philosophical positioning of the study and the empirical evidence presented in Chapter 4.

Chapter 4
Research Results

4.1 Introduction

This study was conducted in three distinct phases, each designed to build a contextually grounded understanding of electronic health record (EHR) adoption readiness at a semi-urban private hospital. Phase 1 focused on identifying and contextualising the key factors influencing EHR adoption, drawing from existing literature, national policy frameworks, and the operational realities of South African healthcare. This phase culminated in the development of a conceptual model tailored to the pre-implementation environment of the participating hospital, integrating organisational, technological, and individual dimensions of readiness.

Phase 2 involved the design and refinement of a data collection instrument aligned with the conceptual model. Semi-structured interviews were developed to explore stakeholder perspectives on six predefined factors, allowing for both confirmation and expansion of the model's components. Phase 3 centred on thematic data analysis, synthesising participant insights to finalise the factors most relevant to EHR adoption in the study setting. Together, these phases provided a structured yet flexible approach to understanding adoption dynamics, offering both theoretical depth and practical relevance for digital transformation in semi-urban healthcare environments.

EHR implementation success depends on more than technical readiness, system design, and infrastructure. It is deeply influenced by organisational culture, leadership dynamics, and user engagement, which shape adoption in practice (Rogers, 2003; Venkatesh et al., 2003; Rahimi et al., 2018). By situating the findings within this wider context, the study contributes to a deeper understanding of adoption readiness in resource-constrained healthcare environments and offers practical insights for future implementation strategies.

4.2 Factors influencing electronic health record adoption in a private hospital in Soshanguve

In the sections that follow, key themes and illustrative quotations are presented for each factor, offering insight into the nuanced dynamics that inform DT in the resource-constrained healthcare environments of the participating hospital. Table 4.1

summarises the interviewee coding structure and their corresponding managerial roles within the participating hospital. This illustrates the diverse range of operational, clinical, technical, and executive perspectives represented in the study.

Table 4.1 Coding structure of interviewees

Interviewee coding number	Interviewee role within the participating hospital
R1	Finance Manager
R2	General Manager
R3	Executive Finance Director
R4	Human Resources Manager
R5	Pharmacy Manager
R6	Nursing Services Manager
R7	Patient Administration Manager
R8	Information Technology Manager
R9	Technical Manager
R10	Chief Operating Officer

The six parent nodes or a priori codes (EHR system usefulness, facilitating conditions, social factors, technological infrastructure, staff training, and leadership support) were each confirmed as *key adoption factors* influencing eHealth adoption within the participating private hospital in Soshanguve. Significant themes (child nodes or emergent codes) emerged during the thematic analysis of interviews, addressing each of these factors.

4.2.1 Key adoption Factor 1: Electronic health record eHealth system usefulness

The analysis of Factor 1 highlighted that respondents consistently rated system usefulness as a strong driver of adoption, with nine out of 10 participants giving scores ≥8/10. This confirms that EHR system usefulness is a decisive factor in shaping willingness to adopt the system. Table 4.2 presents the key themes, the number of respondents supporting each theme (reference count), and the associated detail, supporting quotations, and suggested implications for EHR system implementation.

Table 4.2 Factor 1: Key themes, reference count, supporting quotations, and implications for EHR system implementation

Key theme	Reference count	Detail	Supporting quotations	Implications for EHR system implementation
Perceived efficiency gains	8	Respondents associated EHRs with streamlined workflows, reduced manual tasks, and faster communication.	**R2**: *"If you have a proper system, it can help a lot... You must have a proper system in place where they submit that information that will go into the system at a certain stage."* **R5**: *"It would increase efficiency... turnaround time for everything would [improve]. We won't have to wait for the doctor to come and prescribe."* **R8**: *"It's already doing that... The paper usage could be greatly reduced."*	Implementation teams should prioritise demonstrating efficiency gains early to build confidence and justify adoption efforts.
Improved service quality	7	EHRs were seen as tools to enhance patient care through accuracy, accessibility, and care coordination.	**R3**: *"The more data you have, the more history you have, the more accurate that is, the better you can serve the patient."* **R4**: *"The system will force us to be more accurate... easy continuation [of care]."* **R10**: *"It will improve service quality... ease of communication between healthcare professionals."*	Highlight clinical benefits in training programmes, such as reduced errors and better care continuity, to align EHR adoption with staff's intrinsic motivation to improve patient outcomes.
Ease-of-use as a critical adoption driver	6	User-friendliness was a recurring prerequisite, especially for non-tech-savvy staff.	**R4**: *"The user-friendliness... is very, very crucial because there are other challenges [like staff age]."* **R7**: *"It needs to work. If it's not working, then am I trying to fight a losing battle?"* **R8**: *"It must be a no-brainer for a user to adopt the system."*	Invest in intuitive user interface design and role-based training (e.g., simplified interfaces for older staff) to reduce resistance. Pilot testing with end-users can identify usability gaps before full rollout.
Data-driven decision-making	5	EHRs were valued for enabling cost management and providing	**R2**: *"If we can find innovative ways by managing our costs better... we are in a cost management business."* **R6**: *"Going paperless... will*	Use data analytics to show return on investment and to secure leadership buy-in and justify

Key theme	Reference count	Detail	Supporting quotations	Implications for EHR system implementation
		strategic insights.	*reduce cost and make [processes] easier."* **R9**: *"It will help... integration [for] planning services or breakdowns."*	budgetary allocations for EHR implementation.
Resistance to change-management challenges	5	Generational resistance and fear of change emerged as barriers.	**R1**: *"It depends on the ability of the system... change management is key."* **R4**: *"27% of my nurses are above 50... training them on technology as a whole is a challenge."* **R5**: *"Older generations don't want change... they still want to see paper."*	Tailor change-management strategies to address generational disparities. Emphasise peer support and incremental transitions to ease anxiety.
Additional desired features	4	Respondents requested cost savings, security, and real-time alerts.	**R4/R6/R9**: *"Paperless would cut costs."* **R10**: *"Cybersecurity [is] a top requirement."* **R4**: *"Doctors get immediate notifications for patient alarms."*	Address security concerns proactively and prioritise features with tangible benefits to incentivise adoption.

EHR: electronic health record

As shown in Table 4.2, respondents identified both motivators and barriers to adoption. The following synthesis highlights how these themes collectively shape perceptions of system usefulness. The most prominent motivators were efficiency gains and service quality improvements, with respondents emphasising streamlined workflows, reduced paperwork, faster communication, and enhanced accuracy in patient care. Ease-of-use (R4, R8) and reliability (R7) also emerged as pivotal adoption drivers, particularly for staff with limited digital skills.

Conversely, generational resistance (R4) and concerns about cybersecurity (R10) were noted as barriers that must be proactively managed. Other themes included the potential for data-driven decision-making, with respondents valuing EHRs for enabling cost management and strategic planning, and requests for additional features such as real-time alerts and robust security safeguards. Among respondents, there was consensus that EHR eHealth system usefulness is a key adoption factor, but it must be paired with

adequate training and interoperability to ensure success.

It could, therefore, be concluded that successful eHealth adoption hinges on demonstrating system usefulness early and mitigating resistance through tailored support. Equally important is aligning the EHR system with both clinical and operational goals. As respondent R2 captured succinctly with regards to Factor 1: *"If you get a system that's helping... for sure you will adopt it*." To consolidate these insights and connect them to the study's conceptual model, the overall conclusion for Factor 1 is presented below.

Overall conclusion for Factor 1

The findings show that perceived system usefulness is the primary factor influencing eHealth adoption within the participating hospital. However, its value must be demonstrated in practice through efficiency gains, improved patient care, and ease-of-use, with cost savings reinforcing its strategic relevance. eHealth adoption within the participating hospital will, therefore, be strengthened by:

- Proving system usefulness early in implementation
- Ensuring ease-of-use and reliability
- Addressing generational resistance with tailored support
- Aligning system features with both clinical and operational priorities

These findings reinforce the relevance of the system-centric dimension of the conceptual model developed in Phase 1 of the study. They confirm that system usefulness is not only a theoretical construct but also a lived priority for healthcare professionals in the Soshanguve context.

4.2.2 Key adoption Factor 2: Trialability

Trialability refers to the ability for staff and decision-makers to test the EHR system before full implementation, allowing them to assess feasibility, fit, and readiness. The analysis revealed trialability as a critical bridge between scepticism and adoption, with all respondents rating it highly (7–10/10) and the majority (7/10) giving the maximum score of 10. This unanimity underscores that trialability is viewed as non-negotiable for building trust and reducing risk. Table 4.3 presents the key themes, the number of respondents supporting each theme (reference count), and the associated detail,

supporting quotations, and suggested implications for EHR system implementation related to Factor 2.

Table 4.3 Factor 2: Key themes, reference count, supporting quotations, and implications for EHR system implementation

Key theme	Reference count	Detail	Supporting quotes	Implications for EHR system implementation
Critical importance of trialling before adoption	10	All respondents (R1–R10) emphasised that Trialability is non-negotiable for adoption.	**R1**: *"100% important... I think all future decisions about systems must involve trialling."* **R8**: "*It's a deal breaker. Without trialling, we can't even talk about adoption."* **R10**: "*Important to see if it works in your practice... and integrates with billing systems."*	Conduct pilot phases in high-impact units to demonstrate value and build trust. Avoid "big bang" rollouts.
Expectations for a successful trial	10	Respondents defined success as accuracy, workflow integration, and problem-solving during testing.	**R3**: *"A positive outcome... comparison of physical vs electronic data accuracy."* **R7**: *"Must work from admission to discharge verification. If it fails mid-process, adoption fails."* **R4**: *"Staff must operate it efficiently... with on-site IT [Information Technology] support to fix glitches immediately."*	Design trials to mirror real workflows (e.g., end-to-end patient journeys) and include on-site technical support to address issues in real time.
Context-specific testing needs	8	Respondents demanded tests tailored to hospital-specific needs, such as: • Integration with external labs/radiology (R4, R5).	**R4**: *"How will it integrate with labs and blood banks? These are independent businesses."* **R9**: *"Security is critical... patient data must be secure on the server."* **R5**: *"Doctors, billing,*	Prioritise interoperability testing with external partners and validate compliance requirements during trials.

Key theme	Reference count	Detail	Supporting quotes	Implications for EHR system implementation
		• Security/compliance checks (R9, R10). • Departmental collaboration (e.g., doctors, billing, nursing) (R5, R9).	*and case management features must be tested together."*	
Influence of Trialability on willingness to adopt	7	The ability to trial directly correlated with adoption willingness (average rating: 9/10).	**R2**: *"If we see it working, we'll adopt it. Benefits must reduce risk and improve efficiency."* **R6**: *"Trial identifies training needs... staff must adapt before full rollout."* **R9**: *"trialling polishes the system. Without it, we risk unresolved hiccups."*	Use trial feedback to co-design solutions with end-users (e.g., nurses, doctors) to increase buy-in.

As shown in Table 4.3, respondents highlighted both universal and context-specific requirements for trialability. The following synthesis illustrates how these themes collectively shape perceptions of system fit and readiness. Respondents emphasised that trials are essential for mitigating risk (R1, R4, R5) and identifying practical gaps (R6, R9). Context-specific needs were highlighted, with intensive care (R2), billing (R7), and laboratory integration (R4) identified as top priorities for testing. Compliance requirements, including regulatory checks (R5) and security validation (R9), were also considered indispensable components of trial phases.

Expectations for successful trials included accuracy, workflow integration, and problem-solving during testing. Respondents stressed that trials must mirror real workflows, such as end-to-end patient journeys, and be supported by on-site Information Technology (IT) staff to resolve issues immediately. The ability to trial was directly correlated with adoption willingness (average rating: 9/10), with respondents noting that trialling identifies training needs and allows staff to adapt before full rollout.

It could, therefore, be concluded that successful adoption hinges on proving system fit

through real-world testing, integrating user feedback, and making iterative improvements before full-scale implementation. Respondent R8 characterised this need by stating: *"A system you can't trial is a system you can't adopt."* To consolidate these insights and connect them to the study's conceptual model, the overall conclusion for Factor 2 is presented below.

Overall conclusion for Factor 2

The findings show that trialability is a decisive factor for adoption readiness. Staff view Factor 2 as the safeguard that ensures the system fits their workflows, meets compliance standards, and delivers promised benefits. Adoption will be strengthened by:

- Conducting pilot phases in high-impact units
- Designing trials to replicate real workflows and provide immediate technical support
- Validating interoperability and compliance requirements during testing
- Using trial feedback to co-design solutions with end-users, increasing buy-in and confidence

These findings reinforce the relevance of the system-centric dimension of the conceptual model developed in Phase 1 of the study, confirming that trialability is not only a theoretical construct but a practical mechanism for translating readiness into real-world adoption.

4.2.3 Key adoption Factor 3: Facilitating conditions

Facilitating conditions refer to the organisational, technical, and resource supports required to enable successful EHR adoption. The analysis revealed that the hospital's readiness to support adoption was moderate (average rating: 6.4/10), with critical gaps in funding, IT infrastructure, and staff preparedness. While some departments (e.g., R5, R8) reported robust IT systems, others faced severe resource shortages (R4, R6) or hidden compatibility issues (R8). Table 4.4 presents the key themes, reference count and associated detail, supporting quotations, and suggested implications.

Table 4.4 Factor 3: Key themes, reference count, supporting quotations, and implications for EHR system implementation

Key theme	Reference count	Detail	Supporting quotes	Implications for EHR system implementation
Financial barriers	9	High costs and competing priorities (e.g., medical equipment) delay adoption.	**R4**: "A system costs 2M ZAR [South African rand] ... but theatre machines are income-generators." **R6**: *"Financially, this might not be our first priority."* **R10**: *"Initial capital outlay is high, but long-term benefits justify it."*	Develop phased funding plans and highlight return on investment to secure leadership buy-in.
IT infrastructure gaps	8	Hardware, bandwidth, and cybersecurity readiness vary widely.	**R4**: *"No, we lack infrastructure... gaps must be addressed."* **R5**: *"Our IT is agile, but nurses need tablets."* **R8**: *"Hidden compatibility issues (e.g., printers) emerge during testing."*	Pre-implementation audits of IT infrastructure and pilot testing to uncover hidden gaps.
Training needs	7	Staff training must address tech literacy (especially for older/non-tech-savvy staff).	**R2**: *"Train 'champions' to cascade knowledge; avoid contractor dependency."* **R4**: *"Nurses over 50 struggle with tech... need ongoing training."* **R7**: *"Training must cover end-to-end workflows to ensure confidence."*	Tiered training programmes: ○ Basic tech skills for older staff. ○ Role-specific EHR workflows (e.g., nurses vs admins). ○ "Super-user" champions (R2's model) for peer support.
Cybersecurity and compliance	7	Data security (POPIA compliance) and backup systems are critical.	**R4**: *"We lost everything in a hack... need backups of backups."* **R9**: *"Patient data security is the first thing to test."* **R3**: *"Compliance offices must ensure data protection."*	Partner with cybersecurity experts to design protocols and test breach responses during trials.

Key theme	Reference count	Detail	Supporting quotes	Implications for EHR system implementation
Workflow integration	7	EHRs must align with existing clinical/billing workflows.	**R5**: *"Doctors must see the importance... or they'll resist."* **R7**: *"Slow systems delay accounts... bandwidth is vital."* **R8**: *"Train staff to accomplish tasks within the EHR, not just navigate it."*	Map current workflows pre-implementation and customise EHR configurations to minimise disruption.

EHR: electronic health record; IT: Information Technology; POPIA: Protection of Personal Information Act.

As can be seen in Table 4.4, respondents highlighted both universal and context-specific requirements for trialability. The following synthesis illustrates how these themes collectively shape perceptions of system fit and readiness. The most pressing challenges included financial barriers, where high costs competed with other priorities such as medical equipment, and infrastructure gaps, with outdated hardware, limited bandwidth, and insufficient devices for frontline staff. Respondent R4 captured the urgency of these issues: *"Absolutely no infrastructure... cyberattacks are a nightmare."*

Personnel limits also emerged as a barrier, with staff lacking adequate training and the absence of IT "champions" to drive adoption. Respondent R2 emphasised: *"Without trained on-site IT champions, adoption fails the moment contractors leave."* Cybersecurity and compliance concerns were equally critical, with respondents citing past breaches and the need for robust backup systems and POPIA compliance. Finally, workflow integration was highlighted as essential, with respondents stressing that EHRs must align with existing clinical and billing processes to avoid disruption.

Based on this analysis, it could be concluded that successful EHR adoption hinges on addressing resource gaps early, aligning technology with workflows, and prioritising staff empowerment. The hospital's readiness scores reveal urgent needs for financing, infrastructure upgrades, and comprehensive training programmes. To consolidate these insights and connect them to the study's conceptual model, the overall conclusion for Factor 3 is presented below.

Overall conclusion for Factor 3

The findings show that facilitating conditions are a foundational enabler of EHR adoption. Adoption will be strengthened by:

- Developing phased funding plans and demonstrating return on investment to secure leadership buy-in
- Conducting pre-implementation audits of IT infrastructure and pilot testing to uncover hidden gaps
- Implementing tiered training programmes, including “super-user” champions to cascade knowledge
- Partnering with cybersecurity experts to design protocols and test breach responses
- Mapping current workflows and customising EHR configurations to minimise disruption

These findings reinforce the relevance of the institution-centric dimension of the conceptual model developed in Phase 1, confirming that financial resources, infrastructure readiness, training, and workflow alignment are not peripheral but central to enabling adoption in resource-constrained healthcare environments.

4.2.4 Key adoption Factor 4: Technological infrastructure

Technological infrastructure refers to the hardware, networks, and system integration capabilities that underpin EHR adoption. The analysis revealed that the hospital’s IT readiness was moderate (average rating: 6.7/10), with integration challenges and ward-level infrastructure gaps identified as the most significant barriers. Success requires targeted funding for hardware and network upgrades, cross-functional collaboration between IT staff and clinicians, and robust downtime protocols to maintain trust during outages. Table 4.5 presents the key themes, reference count and associated detail, supporting quotations, and suggested implications.

Table 4.5 Factor 4: Key themes, reference count, supporting quotations, and implications for EHR system implementation

Key theme	Reference count	Detail	Supporting quotes	Implication
Hardware and device gaps	8	Inconsistent readiness, especially in clinical areas (e.g., tablets for nurses).	**R5**: *"Wards need tablets... current IT staff can't support expansion."* **R6**: *"Entry-level systems won't suffice... full upgrades needed."* **R4**: *"No space for workstations; theft risks for devices."*	Conduct a device audit and budget forward-specific hardware. Prioritise secure storage solutions.
Network reliability	7	Wi-Fi/bandwidth issues in critical zones (intensive care units, theatres) and during outages.	**R2**: *"Wi-Fi fails in ICUs [intensive care units] due to lit walls... boosters aren't enough."* **R10**: *"Backup Wi-Fi exists, but generators are essential for outages."* **R3**: *"Low confidence in current network stability."*	Test network coverage in high-priority areas and invest in hardwired backups (e.g., Ethernet in intensive care units).
System integration challenges	7	Legacy software (e.g., SAP) must integrate seamlessly with new EHRs.	**R2**: *"Systems must 'talk' to each other... poor integration frustrates users."* **R10:** *"SAP integration is critical but requires change management."* **R5**: *"IT [Information Technology] and clinicians speak different languages... integration specialists needed."*	Pre-implementation application programming interface testing and hire integration experts to bridge IT–clinical divides.

Key theme	Reference count	Detail	Supporting quotes	Implication
Cybersecurity and data storage	7	Concerns about data breaches, POPIA compliance, and backup systems.	**R4**: *"We lost everything in a hack... need backups of backups."* **R9**: *"UPS [uninterruptible power supply] systems are critical to prevent downtime."* **R10**: *"Cloud storage helps, but power outages risk data loss."*	Partner with cybersecurity firms to design protocols and test breach responses. Implement redundant storage (cloud and on-site).
Space and workflow design	6	Physical layout conflicts with digital workflows (e.g., no private charting areas).	**R6**: *"Nursing stations expose patient data... need hidden workstations."* **R4**: *"No space for new hardware in cramped wards."*	Redesign clinical spaces to include secure EHR workstations and prototype layouts during trials.

EHR: electronic health record, POPIA: Protection of Personal Information Act; SAP: Systems, Application and Products in Data Processing software

As shown in Table 4.5, respondents identified multiple technological barriers and enablers. At the organisational level, budget constraints (R4, R6) and competing priorities were delaying IT investments. Technological barriers included hardware shortages (R5), unreliable networks (R2, R3), and poor system integration (R2, R10). At the individual level, clinicians expressed concerns about workflow disruptions (R6) and the lack of IT support (R5). Respondent R2 captured the importance of integration expertise: *"A system is stupid – it only does what you programme it to do. Without integration experts, adoption fails."*

The most prominent themes included hardware and device gaps, with wards lacking tablets and secure storage solutions; network reliability, particularly in intensive care units and theatres; and system integration challenges, where legacy systems such as SAP needed seamless interoperability with new EHR platforms. Concerns about cybersecurity and data storage were also critical, with respondents citing past breaches and the need for redundant backups. Finally, space and workflow design emerged as a

practical barrier, as cramped wards lacked private charting areas and secure workstation layouts.

It can, therefore, be concluded that successful EHR adoption hinges on strengthening the hospital's technological foundation. Without reliable infrastructure, even well-designed systems risk failure due to workflow disruptions, data insecurity, or integration breakdowns. To consolidate these insights and connect them to the study's conceptual model, the overall conclusion for Factor 4 is presented below.

Overall conclusion for Factor 4

The findings show that technological infrastructure is a core enabler of EHR adoption. Adoption will be strengthened by:

- Conducting device audits and budgeting for hardware upgrades, with secure storage solutions
- Testing network coverage in high-priority areas and investing in hardwired backups
- Hiring integration experts and conducting Application Programming Interface (API) testing to ensure interoperability
- Partnering with cybersecurity firms to design protocols and implement redundant storage
- Redesigning clinical spaces to accommodate secure EHR workstations and minimise workflow disruption

These findings reinforce the relevance of the institution-centric dimension of the conceptual model developed in Phase 1, confirming that reliable hardware, robust networks, secure data systems, and workflow-aligned layouts are indispensable for sustainable EHR adoption in resource-constrained healthcare environments.

4.2.5 Key adoption Factor 5: Staff training

Staff training emerged as a pivotal factor for EHR adoption within the participating hospital, with unanimous agreement on its importance. All participants rated the need for training above 8/10, underscoring its central role in building confidence and willingness to adopt the system. Key concerns included workload barriers, disparities in digital skills, and the need for continuous support. High-quality, role-specific training was

consistently linked to higher adoption readiness. Table 4.6 presents key themes, reference counts and detail, supporting quotes, and suggested implications of Factor 5.

Table 4.6 Factor 5: Key themes, reference count, supporting quotations, and implications for EHR system implementation

Key theme	Reference count	Detail	Supporting quotes	Implication
Structured training necessity	9	Structured training is essential for EHR adoption, as it builds confidence and the willingness to use the system.	**R9**: *"Training is more important than everything... if your end user is not aware of how to use the system, you will not have the full perfect results."*	Hospitals must allocate sufficient time and resources for comprehensive training programmes. Training should be mandatory and integrated into workflow planning to ensure participation.
Barriers to training access	8	High workloads, staffing shortages, and a lack of relief staff were cited as major obstacles to training completion.	**R4:** *"The biggest challenge is ensuring staff are available for training without compromising patient care."*	Hospitals should implement staggered training schedules to minimise disruptions. Temporary staffing or workload adjustments may be necessary to facilitate attendance.
Addressing varying digital skills	7	Staff have differing levels of digital literacy, requiring customised training approaches.	**R10**: *"A need analysis is required to assess digital understanding levels."*	Conduct a pre-training skills assessment to tailor sessions (e.g., basic vs advanced modules). Offer one-on-one coaching for less tech-savvy employees (e.g., older staff or nurses).
Need for ongoing support	7	Training should not end at implementation – ongoing mentorship and troubleshooting are critical.	**R8**: *"Hand-holding and mentorship are crucial... someone must be there to guide."*	Assign "EHR champions" in each department for peer support. Provide 24/7 tech support and easily accessible resources (e.g., manuals, video tutorials).
Quality of training influences adoption	8	Poor training quality leads to resistance, while effective training increases adoption rates.	**R7**: *"Training needs to be 100%... not just reading off a note."*	Use interactive, hands-on training methods (e.g., simulations) instead of passive lectures. Regularly evaluate training effectiveness through feedback and adjust accordingly.

EHR: electronic health record

As shown in Table 4.6, respondents identified multiple training requirements and barriers. Respondents emphasised the necessity of structured training programmes (R9), noting that without comprehensive preparation, staff would lack the confidence to use the system effectively. Barriers to training access were also highlighted, with high workloads and staffing shortages making it difficult to release staff for training without compromising patient care (R4).

Another recurring theme was the need to address varying digital skills, particularly among nurses and older staff, who were identified as the least digitally skilled group. Respondents recommended tiered training programmes, ranging from basic digital literacy to advanced modules for IT staff, supported by one-on-one coaching where necessary (R10). The importance of ongoing support was also stressed, with respondents calling for departmental "EHR champions", mentorship, and accessible resources such as manuals and video tutorials (R8). Finally, the quality of training was seen as a decisive factor: poor training led to resistance, while interactive, hands-on methods such as simulations increased adoption rates (R7).

As a result of this analysis, it could be concluded that successful EHR adoption hinges on structured, high-quality training that is continuous, accessible, and role-specific. Hospitals must proactively address staffing constraints and skill gaps during pre-implementation to ensure buy-in and confidence among staff. As respondent R2 noted: *"If you have the system and quality training to tell people how to get outcomes, then your system will work."* To consolidate these insights and connect them to the study's conceptual model, the overall conclusion for Factor 5 is presented below.

Overall conclusion for Factor 5

The findings show that staff training is a **critical enabler** of EHR adoption. Adoption will be strengthened by:

- Allocating sufficient time and resources for structured, mandatory training programmes
- Implementing staggered schedules and relief staffing to mitigate workload barriers
- Conducting pre-training skills assessments and tailoring content to varying digital literacy levels

- Embedding ongoing support through departmental champions, mentorship, and accessible resources
- Ensuring training quality through interactive, hands-on methods and continuous evaluation

These findings reinforce the relevance of the institution-centric dimension of the conceptual model developed in Phase 1, confirming that staff training is not a peripheral activity but a central determinant of adoption success in resource-constrained healthcare environments.

4.2.6 Key adoption Factor 6: Electronic health record social factors

Social factors, including leadership buy-in, peer influence, and organisational culture, emerged as pivotal in shaping EHR adoption. Leadership commitment was consistently identified as the strongest predictor of success, while peer support and cultural readiness acted as accelerators or barriers. Resistance was often tied to fear of change and a lack of visible benefits.

The analysis revealed that successful EHR adoption requires top-down leadership commitment combined with bottom-up peer support, with cultural readiness fostered through transparent communication and demonstrable benefits. Table 4.7 presents the key themes, reference counts and associated detail, supporting quotes, and suggested implications.

Table 4.7 Factor 6: Key themes, reference count, supporting quotations, and implications for EHR system implementation

Key theme	Reference count	Detail	Supporting quotes	Implication
Leadership buy-in as a critical driver	10	Leadership support strongly influences staff willingness to adopt EHRs. Visible commitment and resource allocation from leadership builds confidence.	**R2**: *"If the benefits are there and people can see what they get from the system, it will be a 10. But if it's just another burden, it's going to be a null."*	Hospital executives must actively champion EHR adoption through clear communication and participation in training. Leadership should allocate budgets for training and change management to demonstrate commitment.

Peer influence and social proof	9	Staff are heavily influenced by peers' opinions, especially those with firsthand EHR experience. Negative peer feedback can derail adoption.	**R2**: *"If my nurse manager says this won't work, it will influence me... but if it's a genuine system, peer opinions matter less."*	Identify and train "EHR champions" (early adopters) to model positive attitudes and assist colleagues. Share success stories from other hospitals to build credibility.
Organisational culture and resistance to change	7	Hospitals with cultures resistant to change face higher barriers. Staff prefer proven systems ("if it's not broken, don't fix it").	**R8**: *"People have muscle memory... you must prove the new system is worth it."*	Conduct pre-implementation change-management campaigns to address fears (e.g., workshops, Q&A sessions). Pilot EHRs in small departments first to demonstrate benefits before hospital-wide rollout.
Perceived benefits as a motivator	6	Staff are more willing to adopt EHRs if they see tangible benefits (e.g., reduced duplication, improved efficiency).	**R2**: *"If we see benefits, the culture responds positively... like our new payroll system, which everyone now welcomes."*	Highlight EHR advantages (e.g., faster access to records, reduced errors) during training. Use data from pilot tests to show measurable improvements.
Hierarchy of influence in adoption	4	Leadership buy-in ranks highest in driving adoption, followed by peer support and cultural fit.	**R8**: *"Leadership is gold, peer support silver, cultural fit bronze."*	Prioritise securing leadership endorsement before addressing peer or cultural factors. Align EHR rollout with cultural readiness (e.g., gradual implementation for resistant teams).

EHR: electronic health record; Q&A: question and answer

As shown in Table 4.7, respondents identified multiple social drivers and barriers. The following synthesis illustrates how these themes collectively shape perceptions of leadership, peer influence, and cultural readiness. Leadership buy-in was highlighted

as a critical driver, with visible executive support and resource allocation building staff confidence (R2). Peer influence and social proof also played a significant role, as staff were heavily influenced by colleagues' opinions, particularly those with firsthand EHR experience. Respondents noted that negative peer feedback could derail adoption, while positive champions could accelerate it.

Organisational culture was another important factor, with resistance to change linked to entrenched habits and scepticism about new systems. Respondent R8 observed: *"People have muscle memory... you must prove the new system is worth it."* Perceived benefits were seen as strong motivators, with staff more willing to adopt EHRs when tangible improvements such as reduced duplication and efficiency gains were evident. Finally, a hierarchy of influence was identified: leadership buy-in ranked highest, followed by peer support and cultural fit. Respondent R8 summarised this dynamic: *"Leadership is gold, peer support silver, cultural fit bronze."*

It could, therefore, be concluded that successful adoption hinges on securing visible leadership support, leveraging peer networks, addressing cultural resistance, and communicating benefits early. As respondent R8 noted: *"Leadership is willing, but the system must instil confidence, not despair."* To consolidate these insights and connect them to the study's conceptual model, the overall conclusion for Factor 6 is presented below.

Overall conclusion for Factor 6

The findings for Factor 6 show that social factors are a decisive contextual enabler of EHR adoption. Adoption will be strengthened by:

- Securing leadership endorsement through visible commitment, funding, and participation in training
- Identifying and training peer champions to mentor colleagues and counteract negativity
- Conducting change-management campaigns and pilot tests to address cultural resistance
- Communicating benefits early, highlighting efficiency gains and patient care improvements

- Aligning rollout strategies with cultural readiness, using gradual implementation where resistance is high

These findings reinforce the relevance of the people-centric dimension of the conceptual model developed in Phase 1, confirming that leadership, peer influence, and organisational culture are not peripheral but central to shaping adoption attitudes.

4.3 Conclusion

This chapter examined the factors influencing the adoption potential of an EHR system in the participating semi-urban private hospital. Through thematic analysis of healthcare professionals' perspectives, six contextualised adoption factors were identified: EHR eHealth system usefulness, trialability, facilitating conditions, technological infrastructure, staff training and competence, and social influence.

Collectively, the findings indicate that EHR adoption potential is shaped not by any single factor, but by the interaction between system-level value, organisational readiness, and human capability. System usefulness and trialability emerged as the most influential system-centric factors, confirming prior adoption research that emphasises anticipated value and experiential learning as drivers of readiness (Davis, 1989; Rogers, 2003).

Institution-centric factors, particularly facilitating conditions and technological infrastructure, were shown to function as gatekeeping conditions that either enable or constrain adoption, consistent with readiness-oriented frameworks in the eHealth literature. At the people-centric level, staff training and social influence were critical in shaping confidence, legitimacy, and willingness to engage with the proposed system.

These findings confirm the relevance of established adoption theories while extending them by demonstrating how adoption readiness manifests in a semi-urban private hospital context characterised by infrastructural constraints and uneven resource distribution. The synthesis of findings provides a foundation for the integrative discussion and recommendations presented in Chapter 5.

Chapter 5
Discussion, Recommendations, and Conclusions

5.1 Introduction

The adoption of electronic health record (EHR) systems is shaped by a constellation of interdependent factors, including perceived usefulness, sociotechnical alignment, infrastructure adequacy, workforce readiness, leadership influence, and regulatory compliance (Venkatesh, Thong & Xu, 2012; Ross et al., 2020; Scott & Mars, 2021). Within the context of a semi-urban private hospital in Soshanguve, a township north of Pretoria characterised by a diverse population and proximity to key educational and healthcare institutions, these factors assume heightened significance due to infrastructural constraints, uneven digital capability, and evolving regulatory demands (Coovadia et al., 2009; Nene & Hewitt, 2023).

Despite the hospital's strategic intent to implement an EHR system as a cornerstone of its eHealth transformation, leadership lacked a context-specific, pre-implementation appraisal of the technological, organisational, and human determinants that would influence uptake among healthcare professionals (Benatar, Gill & Bakker, 2022). In an environment characterised by intermittent connectivity, variable digital literacy, and strict compliance requirements under the Protection of Personal Information Act (POPIA), overlooking these determinants risks undermining the very benefits EHR systems are intended to deliver (Staunton et al., 2021). Conversely, a grounded understanding of local adoption dynamics enables more targeted investment, sequencing, and enablement strategies that support improvements in documentation quality, care continuity, decision support, and referral efficiency (Agarwal et al., 2022).

This chapter explicitly reconnects the study's findings to the research problem, aim, and objectives outlined in Chapter 1. The study was positioned to address the lack of context-specific, pre-implementation evidence on the factors influencing EHR adoption potential in a semi-urban private hospital setting. Drawing on the empirical findings presented in Chapter 4, this chapter synthesises the identified adoption factors to develop an integrated understanding of EHR adoption readiness within the participating hospital. The discussion links the findings to the theoretical frameworks reviewed in Chapter 2, consolidates critical pre-adoption outcomes, and translates these insights

into actionable recommendations. In doing so, the chapter integrates the theoretical, empirical, and contextual strands of the study and articulates both its practical and theoretical contributions to eHealth (electronic health) adoption literature in a pre-implementation, semi-urban private healthcare context.

5.2 Validation of a priori factors influencing eHealth adoption within the participating hospital in Soshanguve

This study's findings provide empirical support for the six *contextualised adoption factors* identified as potential influencers of EHR adoption during the pre-implementation phase of eHealth transformation. Through thematic analysis of ten semi-structured interviews, each factor (system usefulness, trialability, facilitating conditions, technological infrastructure, staff training, and social factors) emerged as a distinct and meaningful *key adoption factor* influencing eHealth adoption within the participating semi-urban hospital. These factors align closely with the theoretical foundations drawn from the technology acceptance model (TAM) (Davis, 1989), the unified theory of acceptance and use of technology (UTAUT) (Venkatesh et al., 2003), the diffusion of innovation (DOI) theory (Rogers, 2003), the telehealth readiness model (TRM) (Jennett et al., 2003), and the connected health model (CHM) (Caulfield & Donnelly, 2013), while extending these frameworks into a pre-implementation, semi-urban private healthcare context.

The conceptual map shown in Figure 5.1 illustrates the six *key adoption factors* influencing eHealth adoption in the participating private hospital in Soshanguve. Each *key adoption factor* branches into associated key adoption themes, making 30 themes. The structure provides a visual representation of how the factors and key adoption factors and themes interconnect. Branch length reflects the relative prevalence of each theme among the ten interviewees, based on reference counts, thereby offering a visual perspective on the strength and distribution of responses. This mapping not only highlights the breadth of themes but also conveys their comparative significance within the dataset, enabling a deeper understanding of the factors influencing eHealth adoption.

Figure 5.1 Conceptual map providing a visual representation of how the factors and themes are interconnected

IT: Information Technology

System usefulness was consistently rated as the most influential factor, with nine out of 10 respondents scoring it at or above 8/10. Participants emphasised efficiency gains, improved service quality, and data-driven decision-making as core motivators. However, usefulness alone was considered insufficient; respondents indicated that it needed to be paired with ease-of-use, system reliability, and interoperability to translate into meaningful adoption. Participants interpreted system usefulness not as an abstract

performance construct, but as a practical judgement shaped by prior experiences with paper-based systems, workload pressures, and expectations of how the EHR would alter day-to-day clinical practice.

This finding directly reflects the theoretical foundations of TAM (Davis, 1989) and UTAUT (Venkatesh et al., 2003), which identify perceived usefulness and ease-of-use as the strongest predictors of behavioural intention to adopt healthcare technologies. Participants' emphasis on efficiency, service quality, and interoperability mirrors these theoretical predictors and also extends them by highlighting the importance of interoperability in semi-urban hospital settings, where fragmented systems and infrastructural constraints can hinder adoption even when usefulness is recognised. From a CHM perspective (Caulfield & Donnelly, 2013), this highlights that usefulness is contingent on system connectedness and integration across clinical and administrative functions, rather than isolated functionality.

Trialability was strongly endorsed, with all respondents rating it between 7 and 10, and 70% assigning the maximum score. The ability to test the system in context-specific environments (e.g., intensive care units, billing departments, and laboratories) was seen as essential for building trust and identifying practical gaps. Trial phases were, therefore, perceived not only as technical evaluations but also as strategic tools for staff engagement and change management. Respondents made sense of trialability as a mechanism for reducing uncertainty and building trust, reflecting their need for reassurance.

This emphasis on trial phases is strongly supported by DOI research (Rogers, 2003; Rahimi et al., 2018), which shows that experimentation reduces uncertainty and fosters confidence in adoption. The findings also align with TRM (Jennett et al., 2003), which emphasises phased readiness development and institutional preparedness prior to implementation. From a CHM perspective (Caulfield & Donnelly, 2013), trialability enables interaction between people, processes, and technology, reinforcing adoption readiness through experiential learning rather than abstract assurance. Participants' accounts, therefore, reinforce eHealth adoption's theoretical foundations and extend them by emphasising trialability as a tool for organisational learning and cultural readiness in resource-constrained hospital contexts.

Facilitating conditions revealed mixed readiness across departments, with an average rating of 6.4/10. Financial constraints, infrastructure disparities, and personnel limitations were cited as barriers. Despite these challenges, respondents linked successful adoption to early resource alignment, visible leadership support, and the presence of trained IT champions. Participants understood facilitating conditions as signals of organisational commitment and credibility, interpreting the availability of resources and leadership support as indicators of whether the EHR initiative was likely to succeed.

These findings resonate strongly with readiness-oriented frameworks such as the TRM (Jennett et al., 2003), conceptualising facilitating conditions as both enablers and gatekeepers in the adoption process. Findings also align with broader adoption literature, in which organisational support, adequate infrastructure, and leadership involvement are consistently identified as prerequisites for sustaining technology-enabled healthcare change (Agarwal et al., 2022; Benatar, Gill & Bakker, 2022). The participants' emphasis on resource alignment and IT champions mirrors this literature, while also extending it by highlighting the acute impact of departmental disparities and resource constraints in semi-urban South African contexts.

Technological infrastructure was rated 6.7/10, with respondents highlighting hardware gaps, network instability, and integration challenges as persistent concerns. The need for targeted investment, cross-functional collaboration, and robust downtime protocols emerged as critical themes. Infrastructure readiness was viewed not merely as a technical issue but as a strategic imperative influencing staff confidence and system reliability. For example, participants pointed to shortages of tablets in wards, unreliable Wi-Fi in intensive care units, and difficulties integrating legacy systems such as Systems, Applications, and Products in Data Processing (SAP) software. Adoption readiness was understood by participants as contingent on infrastructure reliability, with technological shortcomings interpreted as risks to professional accountability, patient safety, and workflow continuity.

These findings align with broader digital health literature emphasising interoperability, cybersecurity, and system integration as central to effective digital transformation (DT) in hospitals (Halamka, Tripathi & Hashimoto, 2022; Prasad, 2025). From a TRM perspective (Jennett et al., 2003), infrastructure readiness represents a core institutional

condition for adoption, while from a CHM perspective (Caulfield & Donnelly, 2013), failures in connectivity and integration disrupt alignment between technological systems and clinical practice, undermining adoption even when perceived usefulness is high.

Staff training was unanimously rated as essential, with all participants scoring it above 8/10. Structured, role-specific training, particularly for nurses and older staff, was viewed as pivotal. Barriers such as workload pressures and digital literacy disparities were acknowledged, but respondents emphasised that ongoing support, mentorship, and tailored content could mitigate these issues. Participants interpreted training not simply as skills acquisition, but as a source of confidence and legitimacy, shaping their sense of readiness to engage with the EHR and their expectations of future performance.

The strong link between training quality and adoption willingness reflects existing literature demonstrating that effective, context-specific training fosters digital confidence and reduces resistance to change among healthcare professionals (Jennett et al., 2003; Rahimi et al., 2018). Participants' insistence on continuous rather than one-off training extends this work by highlighting the importance of sustained mentorship and departmental champions in resource-constrained hospital contexts. Continuous training also supports sociotechnical integration of staff into new digital workflows by aligning human capability with system functionality, consistent with CHM principles (Caulfield & Donnelly, 2013).

Finally, **social factors,** including leadership buy-in, peer influence, and organisational culture, emerged as powerful drivers of adoption. Respondents consistently ranked leadership commitment as the most decisive influence, noting that visible executive support, resource allocation, and participation in training enhanced staff confidence. Peer networks also played a significant role, with negative feedback capable of derailing adoption and positive champions accelerating it. Cultural readiness was another determinant shaping adoption, as entrenched habits and scepticism required deliberate change management and pilot demonstrations to prove value. Respondents made sense of leadership behaviour, peer attitudes, and organisational culture as cues for acceptable engagement with the EHR, interpreting visible support or resistance as shaping the collective legitimacy of the system.

These dynamics mirror findings in prior studies, which show that visible leadership support and a positive organisational culture enhance technology acceptance and collective readiness for eHealth systems (Benatar, Gill & Bakker, 2022; Van Zyl, Mentz & Goosen, 2023). They also closely align with CHM (Caulfield & Donnelly, 2013), which conceptualises adoption as a sociotechnical process shaped by leadership structures, professional relationships, and cultural norms. The layered influence described by respondents and summarised by respondent R8's observation of "*leadership as gold, peer support silver, cultural fit bronze*" illustrates how social hierarchies of influence shape adoption attitudes. In doing so, the findings extend prior work by foregrounding the layered interplay of leadership, peer endorsement, and cultural fit in a semi-urban private hospital setting.

5.3 Critical pre-adoption readiness outcomes

To move beyond isolated factor analysis and toward actionable insight, the thematic results were examined holistically to identify higher-order pre-adoption readiness conditions. This synthesis focused on patterns that emerged across the six *key adoption factors*, revealing five *critical pre-adoption readiness outcomes* that reflect the organisational, technological, and cultural conditions required for successful EHR implementation in the participating hospital. These *critical pre-adoption readiness outcomes*, presented in Table 5.1 and supported by illustrative respondent quotations, represent the convergence of multiple adoption factors identified in Chapter 4. Rather than constituting new or independent findings, these outcomes function as a diagnostic framework for assessing organisational readiness and guiding EHR implementation planning within the participating hospital.

Table 5.1 Critical pre-adoption readiness outcomes of the qualitative analysis of interviews

No.	Critical pre-adoption outcome	Supporting quotes
1	Success hinges on leadership and culture	**R8**: *"Leadership is willing, but the system must instil confidence, not despair."* **R2**: *"If the benefits are visible, adoption will follow. Otherwise, it's just another burden."*
2	Staff training and support are non-negotiable	**R9**: *"Training is more important than everything... without it, you won't get perfect results."* **R4**: *"The biggest challenge is freeing staff for training without compromising patient care."*
3	Prove value early through pilot testing	**R1**: *"100% important – no adoption without trailing."* **R6**: *"Test first to adapt and make the system fluent."*
4	Address technological and financial barriers	**R4**: *"We lack infrastructure... cyberattacks are a nightmare."* **R10**: *"Long-term efficiency gains justify the high initial costs."*
5	Leverage peer influence	**R2**: *"If my nurse manager says it won't work, it influences me, but a genuine system speaks for itself."*

Collectively, these critical outcomes highlight the interplay between leadership, infrastructure, training, and workplace culture, underscoring what must be in place before implementation can proceed effectively. As respondent R8 succinctly observed, "*A system you can't trial is a system you can't adopt*". This statement encapsulates a recurring pattern across the interview data: trialability is not merely a desirable feature but a foundational prerequisite for adoption. More broadly, the synthesis confirms that readiness is shaped by demonstrable value, contextual fit, and user confidence established through real-world testing rather than abstract assurances.

5.4 Recommendations

Several recommendations were derived from the thematic analysis of the six *contextualised adoption factors* and the five *critical pre-adoption readiness outcomes*. Each recommendation corresponds to one or more *critical pre-adoption readiness outcomes* and is further supported by relevant eHealth adoption and implementation literature. Collectively, the recommendations translate empirical readiness conditions

into actionable guidance for hospital leadership, implementation teams, and policy-makers seeking to enhance EHR adoption in semi-urban private healthcare settings.

5.4.1 Leadership and cultural readiness

Visible leadership commitment consistently emerged as a decisive readiness condition, reinforcing its role as a key driver of technology adoption in healthcare. Leaders must not only endorse the EHR initiative but also actively participate in training, strategic messaging, and budget allocation to build trust and legitimacy during DT initiatives (Benatar, Gill & Bakker, 2022). Structured change-management programmes are equally critical, as organisational culture often resists disruption (Van Zyl, Mentz & Goosen, 2023). Pilot demonstrations, staff forums, and transparent communication can help challenge the 'if it's not broken, don't fix it' mindset, showing that cultural readiness accelerates adoption when change is visibly supported and normalised by leadership.

5.4.2 Staff training and support infrastructure

Staff training and support emerged as non-negotiable readiness conditions, with respondents emphasising both the importance of training quality and the practical challenge of releasing staff without compromising patient care. This aligns with literature showing that tiered, role-specific training reduces anxiety, builds confidence, and mitigates resistance to digital health systems (Jennett et al., 2003; Rahimi et al., 2018). Foundational training should, therefore, be prioritised for nurses and staff with limited prior digital exposure, while scenario-based learning ensures clinical relevance and practical transfer. Accessibility must also be safeguarded: staggered sessions and relief staffing directly address operational constraints and reflect evidence that integrating training into routine operations improves uptake (Agarwal et al., 2022). Beyond the initial rollout, ongoing support mechanisms, including departmental EHR champions, accessible helpdesks, and digital resource libraries, are essential for sustaining adoption (Ross et al., 2020). This recommendation for ongoing support mechanisms after the initial rollout of the EHR system reflects best practice in continuous enablement, reinforcing confidence and supporting long-term system use.

5.4.3 Pilot testing and iterative rollout

Pilot testing was consistently identified as a prerequisite for adoption, with respondents viewing the ability to trial the system as essential for building confidence and

demonstrating value. Phased pilot implementations in high-impact units (e.g., intensive care, billing, and laboratories) allow hospitals to refine workflows, address concerns, and demonstrate system benefits before full-scale deployment. This approach avoids "big bang" rollouts that risk overwhelming staff and infrastructure, a strategy strongly supported by the DOI theory, which positions trialability as a key confidence-building mechanism (Rogers, 2003). Moreover, using pilot feedback to co-design system configurations with end-users enhances usability and ownership (Rahimi et al., 2018). This approach reflects participatory design principles that have been shown to strengthen adoption in healthcare settings.

5.4.4 Technological and financial preparedness

Technological and financial preparedness emerged as interdependent readiness conditions, with respondents expressing concern about infrastructure limitations, cybersecurity risks, and the affordability of long-term system maintenance. These concerns support the recommendation for comprehensive IT audits to assess hardware adequacy, network reliability, and system integration capabilities prior to implementation. Infrastructure gaps are widely recognised as barriers to DT in healthcare, particularly in semi-urban private contexts (Mittermaier, Venkatesh & Kvedar, 2023), and proactively addressing them reduces the likelihood of system failure and adoption fatigue. Phased funding strategies, aligned with hospital priorities and supported by transparent communication of anticipated efficiency gains, such as cost savings from paperless workflows, can further strengthen leadership buy-in (Prasad, 2025). Cybersecurity preparedness is equally critical: partnering with specialists to design response protocols, conduct resilience testing, and ensure compliance with POPIA reflects global best practice in health information security (Staunton et al., 2021). Redundant storage systems to safeguard patient data further reinforce resilience and directly address participant concerns regarding data protection.

5.4.5 Social dynamics and peer influence

Social dynamics and peer influence were highlighted as powerful accelerators or barriers to adoption, reinforcing the critical role of normative pressures identified in the findings. Identifying and training peer champions to model positive engagement and mentor colleagues can counteract scepticism and build collective confidence, consistent with evidence that peer networks shape readiness and normalise new practices within

healthcare teams (Scott & Mars, 2021). Leveraging success stories from pilot departments or comparable institutions further enhances credibility (Nene & Hewitt, 2023). Storytelling and peer-led demonstrations have been shown to normalise EHR use, reduce fear of change, and reinforce perceived value (Ganguly et al., 2023; The Beryl Institute, 2024).

5.4.6 Strategic integration and workflow alignment

Strategic workflow alignment emerged implicitly through participant concerns relating to training burden, system fit, and operational disruption. These findings support the recommendation that existing clinical and administrative workflows be mapped prior to implementation to ensure EHR configurations minimise disruption. Literature emphasises that workflow alignment is critical to usability and adoption, particularly in complex clinical environments (Agarwal et al., 2024). Including cross-functional teams (e.g., clinicians, IT staff, administrators) in system design and testing addresses integration challenges holistically and ensures the system reflects real-world needs (Ross et al., 2020). This approach is consistent with sociotechnical alignment frameworks that link system success to organisational fit.

5.4.7 Summary

These recommendations reflect a holistic understanding of the organisational, technological, and individual factors influencing EHR adoption in semi-urban private hospital settings. By addressing leadership, training, infrastructure, pilot testing, and social dynamics in tandem, hospitals can move beyond readiness assessments toward actionable transformation, operationalising EHR adoption in resource-constrained environments. The study is concluded in the following section with a synthesis of key findings, articulation of theoretical contribution, and identification of directions for future research.

5.5 Concluding remarks

This study contributes to the eHealth literature by addressing a critical gap: the absence of context-specific, pre-implementation evidence from semi-urban private hospitals in South Africa. Through the thematic synthesis of six validated *key adoption factors*, namely system usefulness, trialability, facilitating conditions, technological infrastructure, staff training, and social factors, together with the identification of five

critical pre-adoption readiness outcomes, the research provides essential insights into the conditions required for successful EHR implementation in resource-constrained, semi-urban private contexts. These findings were translated into actionable recommendations that address the interdependent technological, organisational, and human dimensions of adoption (Zharima, Griffiths & Goudge, 2023; Finnegan & Mountford, 2025; Mugauri et al., 2025; Musakuro & Gie, 2025; Simbini et al., 2025). By highlighting what must be in place before implementation, the study offers a practical roadmap for hospital leadership and implementation teams, grounded in local realities and shaped by healthcare professionals' lived experiences. In doing so, the research contributes both applied guidance and conceptual clarity to ongoing efforts to strengthen digital health transformation in South Africa.

5.5.1 Realisation of research aim, questions, and objectives

This section demonstrates how the research aim, questions, and objectives introduced in Chapter 1 have been realised through the study's design, data analysis, and synthesis of the findings. The overarching aim of the study was to generate evidence-based insight into the conditions necessary for successful EHR implementation in a semi-urban private hospital context. This aim was addressed by translating the research problem into a structured inquiry grounded in established technology adoption literature and contextual analysis. The research questions guided the empirical exploration of how adoption readiness is shaped by system-centric, institution-centric, and people-centric domains, while the research objectives operationalised this inquiry through systematic factor identification, thematic synthesis, and contextual modelling.

The interpretivist paradigm adopted in this study enabled an in-depth exploration of how healthcare professionals made sense of EHR adoption within their organisational and cultural context. Rather than treating adoption factors as fixed variables, the findings reflect participants' interpretations of leadership credibility, system value, and organisational readiness, shaped by prior experiences, professional norms, and contextual constraints. Through qualitative analysis of healthcare professionals' perspectives, the study identified key adoption factors, explored barriers and enablers, synthesised critical readiness outcomes, and translated these insights into actionable, context-sensitive recommendations.

The achievement of these objectives ensured methodological coherence, with each phase of the study logically building on the previous one. By integrating theory, empirical evidence, and practical application, the study not only fulfilled its stated aim but also demonstrated how global technology adoption models can be meaningfully adapted to local healthcare realities. The resulting framework links theory to practice by showing how adoption readiness emerges from the alignment of organisational capacity, infrastructural adequacy, and social dynamics.

In conclusion, the study demonstrates that while the anticipated benefits of EHRs, such as efficiency, improved patient care, and cost savings, are widely recognised, this study demonstrates that their realisation is conditional on organisational readiness, infrastructural adequacy, cultural alignment, and deliberate sequencing through pilot testing and training. By explicitly linking the empirical findings to the original research problem, aim, and objectives, internal coherence of the study and the realisation of the study's intended purpose have been demonstrated. This study, therefore, provides a sound foundation for both future scholarship and practical transformation in semi-urban private healthcare settings.

5.5.2 Theoretical contribution

Beyond its practical implications, this study makes an explicit theoretical contribution to the eHealth adoption literature by extending established technology adoption and readiness models into a pre-implementation, semi-urban private healthcare context in South Africa. While theories and models, such as TAM (Davis, 1989), UTAUT (Venkatesh et al., 2003), and the DOI theory (Rogers, 2003), have predominantly been applied to explain post-adoption behaviour, this study reframes their core constructs as indicators of adoption potential and readiness prior to system implementation.

The study further contributes theoretically by drawing on TRM (Jennett et al., 2003) and CHM (Caulfield & Donnelly, 2013) as integrative readiness lenses. Constructs relating to institutional preparedness, infrastructure, human capability, and sociotechnical alignment were incorporated into the analytical framework to complement individual-level adoption constructs. This approach enabled the study to account for organisational and system-level readiness conditions while remaining appropriate to a pre-implementation inquiry centred on healthcare professionals' perspectives.

By integrating system-centric factors (EHR eHealth system usefulness and trialability), institution-centric conditions (facilitating conditions, technological infrastructure, and resource availability), and people-centric dynamics (staff training and competence, leadership influence, peer support, and cultural readiness) into a single contextualised diagnostic framework, the study demonstrates how theoretically established constructs interact under conditions of infrastructural constraint, regulatory compliance, and variable digital capability. Consistent with the readiness orientation of TRM (Jennett et al., 2003) and the sociotechnical emphasis of CHM (Caulfield & Donnelly, 2013), the findings show that adoption readiness does not arise from isolated individual perceptions alone, but emerges from the alignment between organisational capacity, social dynamics, and system affordances within semi-urban private hospital environments.

In doing so, the study contextualises global adoption models within local healthcare realities. It contributes a pre-implementation readiness perspective that extends their explanatory scope without overstating model validation or generalisability.

5.5.3 Limitations of the study

This study has four key limitations that should be considered when interpreting the findings. First, the research was conducted within a single semi-urban private hospital, which limits the generalisability of the findings to other healthcare contexts. While this focus enhanced contextual depth and internal coherence, the results may not be directly transferable to public hospitals or urban healthcare settings.

Second, the study adopted a pre-implementation perspective, focusing on healthcare professionals' perceptions of EHR adoption potential rather than observed system use. Although this aligns with the study's aim of assessing adoption factors prior to implementation, perceptions may evolve once the system is deployed and actual usage experience is gained.

Third, the qualitative case study design prioritised depth of understanding over breadth, with data collected from a purposive sample of healthcare professionals. While this approach yielded rich contextual insight, it does not allow for statistical generalisation. Finally, although scaled prompts were used within interviews to support reflection on relative importance, these ratings were not intended as quantitative measures and

should be interpreted accordingly.

5.5.4 Future research directions

Future studies should extend this pre-implementation analysis into the post-implementation phase to assess outcomes such as user satisfaction, system sustainability, and measurable efficiency gains following EHR deployment. Such research would enable examination of how pre-adoption readiness conditions identified in this study translate into sustained system use and performance outcomes.

Comparative research across multiple hospital settings—public and private, urban and rural—would further enhance generalisability and support refinement of the adoption framework across diverse healthcare contexts. In addition, longitudinal research designs could capture how healthcare professionals' perceptions evolve over time, particularly as training initiatives, infrastructure upgrades, and leadership engagement mature.

References

Abbott, S.G. and Sigamoney, C. 2024. The current healthcare industry in South Africa. *International Journal of Health and Psychology Research*, 12(3), pp. 11-36. https://doi.org/10.37745/ijhpr.13

Adegoke, K., Adegoke, A., Dawodu, D., Adekoya, A., Bayowa, A., Kayode, T. and Singh, M. 2025. Interoperability as a catalyst for digital health and therapeutics: A scoping review of emerging technologies and standards (2015–2025). *International Journal of Environmental Research and Public Health*, 22(10), article no:1535. https://doi.org/10.3390/ijerph22101535

Adler-Milstein, J. and Jha, A.K. 2017. HITECH act drove large gains in hospital electronic health record adoption. *Health Affairs*, 36(8), pp. 1416-1422. https://doi.org/10.1377/hlthaff.2016.1651

African Development Bank Group. 2022. *Strategy for quality health infrastructure in Africa 2022–2030: Revised version*. Abidjan: African Development Bank. Available at: https://www.afdb.org/en/documents/strategy-quality-health-infrastructure-africa-2022-2030 [Accessed 03 January 2026].

Agarwal, S., Perry, H.B., Long, L.A. and Labrique, A.B. 2015. Evidence on feasibility and effective use of mHealth strategies by frontline health workers in low-resource settings: A systematic review. *Tropical Medicine and International Health*, 20(8), pp. 1003-1014. https://doi.org/10.1111/tmi.12525

Agarwal, S., LeFevre, A.E., Lee, J., Oh, C., Labrique, A.B. and Mehl, G. 2022. Digital health systems strengthening: A systematic review of evidence from low- and middle-income countries. *Bulletin of the World Health Organization*, 100(10), pp. 639–650. https://doi.org/10.2471/BLT.21.287074

Agarwal, R., Guodong, G., DesRoches, C. and Jha, A.K. 2024. The digital transformation of healthcare: Current evidence and future directions. *Health Affairs*, 43(1), pp. 34-41.

Alobayli, F., O'Connor, S., Holloway, A. and Cresswell, K. 2023. Electronic health record stress and burnout among clinicians in hospital settings: A systematic review. *Digital Health*, 9. https://doi.org/10.1177/20552076231220241

Alomar, D., Almashmoum, M., Eleftheriou, I., Whelan, P. and Ainsworth, J. 2024. The impact of patient access to electronic health records on health care engagement: Systematic review. *Journal of Medical Internet Research*, 26(1),

article no: e56473. https://doi.org/10.2196/56473

Alotaibi, N., Wilson, C.B. and Traynor, M. 2025. Enhancing digital readiness and capability in healthcare: A systematic review of interventions, barriers, and facilitators. *BMC Health Services Research*, 25(1), 500. https://doi.org/10.1186/s12913-025-12663-3

Alzghaibi, H. and Hutchings, H.A. 2024. The impact of leadership and management on the implementation of electronic health record systems in primary healthcare centres. *Healthcare (Basel)*, 12(20), article no: 2013. https://doi.org/10.3390/healthcare12202013

Ammenwerth, E., Iller, C. and Mahler, C. 2006. IT-adoption and the interaction of task, technology and individuals: A fit framework and a case study. *BMC Medical Informatics and Decision Making*, 6(1), article no: 3. https://doi.org/10.1186/1472-6947-6-3

Bahl, S., Singh, R.P., Javaid, M., Khan, I.H., Vaishya, R. and Suman, R. 2020. Telemedicine technologies for confronting COVID-19 pandemic: A review. *Journal of Industrial Integration and Management*, 5(4), pp. 547-561. https://doi.org/10.1142/S2424862220300057

Barron, P., Pillay, Y., Fernandes, A., Sebidi, J. and Allen, R. 2016. The MomConnect mHealth initiative in South Africa: Early impact on the supply side of MCH services. *Journal of Public Health Policy*, 37(Suppl 2), pp. 201-212. https://doi.org/10.1057/s41271-016-0015-2

Bashshur, R., Howell, J.D., Krupinski, E., Harm, K.M., Bashshur, N. and Doarn, C.R. 2016. The empirical foundations of telemedicine interventions in primary care. *Telemedicine Journal and e-Health*, 22(5), pp. 342-375. https://doi.org/10.1089/tmj.2016.0045

Benatar, S., Gill, S. and Bakker, I. 2022. Addressing health inequities in South Africa through digital health. *Lancet Digital Health*, 5(3), pp. e142-e149.

Bingham, J.M., Rossi, M.A. and Truong, H.A. 2022. Addressing the need for a telehealth readiness assessment tool as a digital health strategy. *Journal of the American Pharmacists Association*, 62(5), pp. 1524-1527. https://doi.org/10.1016/j.japh.2022.04.016

Black, A.D., Car, J., Pagliari, C., Anandan, C., Cresswell, K., Bokun, T., McKinstry, B., Procter, R., Majeed, A. and Sheikh, A. 2011. The impact of eHealth on the

quality and safety of healthcare: A systematic overview. *PLoS Medicine*, 8(1), article no: e1000387. https://doi.org/10.1371/journal.pmed.1000387

Blumenthal, D. 2010. Launching HITECH. *New England Journal of Medicine*, 362(5), pp. 382-385. https://doi.org/10.1056/NEJMp0912825

Board of Healthcare Funders, 2023. *South African health journal. Solutions for change*. Johannesburg: BHF. https://bhfglobal.com/media/BHF-HealthJournal-2023.pdf [Accessed 23 January 2026].

Bostan, S., Johnson, O.A., Jaspersen, L.J. and Randell, R. 2024. Contextual barriers to implementing open-source electronic health record systems for low- and lower-middle-income countries: Scoping review. *Journal of Medical Internet Research*, 26, article no: e45242. https://doi.org/10.2196/45242

Botes, M., Cooke, R. and Bruce, J. 2023. Experiences of primary health care practitioners dealing with emergencies – "We are on our own". *African Journal of Primary Health Care & Family Medicine*, 15(1), a3775. https://doi.org/10.4102/phcfm.v15i1.3775

Braun, V. and Clarke, V. 2006. Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), pp. 77-101. https://doi.org/10.1191/1478088706qp063oa

Braun, V. and Clarke, V. 2019. Reflecting on reflexive thematic analysis. *Qualitative Research in Sport, Exercise and Health*, 11(4), pp. 589–597. https://doi.org/10.1080/2159676X.2019.1628806

Braun, V. and Clarke, V. 2022. *Thematic analysis: A practical guide*. London: SAGE Publications.

Braun, V. and Clarke, V. 2024. *Thematic analysis: A practical guide*. 2nd ed. London: Sage.

Bryda, G. and Costa, A.P. 2023. Qualitative research in digital era: innovations, methodologies and collaborations. *Social Sciences*, 12(10), p. 570. https://doi.org/10.3390/socsci12100570

Bryman, A. and Bell, E. 2007. *Business research methods*. 2nd ed. Oxford: Oxford University Press.

Buchanan, D., Denyer, D., Jaina, J., Kelliher, C., Moore, C., Parry, E. and Pilbeam, C. 2013. *How do they manage? A qualitative study of the realities of middle and front-line management work in health care*. Southampton (UK): NIHR Journals

Library.

Casanova, R., Villa-Garzon, F.A. and Branch-Bedoya, J.W. 2025. Architectural patterns for health information systems: A systematic review. *Frontiers in Digital Health*, 7, article no: 1694839. https://doi.org/10.3389/fdgth.2025.1694839

Caulfield, B.M. and Donnelly, S.C. 2013. What is connected health and why will it change your practice? *QJM: An International Journal of Medicine*, 106(8), pp. 703-707. https://doi.or/10.1093/qjmed/hct114

Chalmers, D.J., Manley, D. and Wasserman, R. eds. 2009. *Metametaphysics: New essays on the foundations of ontology*. Oxford, GB: Oxford University Press.

Chatzichristos, G. 2025. Qualitative research in the era of AI: A return to positivism or a new paradigm? *International Journal of Qualitative Methods*, 24. https://doi.org/10.1177/16094069251337583

Cho, H., Nguyen, O.T., Weaver, M., Pruitt, J., Marcelle, C., Salloum, R.G. and Keenan, G. 2024. Electronic health record system use and documentation burden of acute and critical care nurse clinicians: A mixed methods study. *Journal of the American Medical Informatics Association*, 31(11), pp. 2540–2549. Available at: https://academic.oup.com/jamia/article/31/11/2540/7755390 [Accessed 15 January 2026]

City of Tshwane Metropolitan Municipality. 2022. Integrated Development Plan (IDP): 2022/2023 – 2026/2027 (5-Year Plan). Available at: https://lg.treasury.gov.za/supportingdocs/TSH/TSH_IDP%20Final_2023_Y_20221020T132356Z_jonathanp.pdf [Accessed 23 January 2026].

Cohen, L., Manion, L. and Morrison, K. 2018. *Research methods in education*. 8th ed. New York: Routledge. https://doi.org/10.4324/9781315456539

Competition Commission. 2024. *Health Market Inquiry: Findings and recommendations*. Pretoria: Competition Commission of South Africa. Available at: https://www.thedtic.gov.za/wp-content/uploads/CCSA-Health-Market-Inquiry-Aug-2024.pdf [Accessed 23 January 2026].

Coovadia, H., Jewkes, R., Barron, P., Sanders, D. and McIntyre, D. 2009. The health and health system of South Africa: Historical roots of current public health challenges. *The Lancet*, 374(9692), pp. 817-834. https://doi.org/10.1016/S0140-6736(09)60951-X

Council for Medical Schemes 2024. *Annual report 2023/24*. Pretoria: CMS. Available

at: https://www.medicalschemes.co.za/cms-annual-report-2023-24/ [Accessed 23 January 2026].

Craig, A., Lawford, H., Miller, M., Chen-Cao, L., Woods, L., Liaw, S.T. and Godinho, M.A. 2025. Use of technology to support health care providers delivering care in low- and lower-middle-income countries: Systematic umbrella review. *Journal of Medical Internet Research*, 27, e66288. https://doi.org/10.2196/66288

Creswell, J.W. and Creswell, J.D. 2018. *Research design: Qualitative, quantitative, and mixed methods approaches.* 5th ed. Los Angeles: Sage Publications.

Creswell, J.W. and Poth, C.N. 2018. *Qualitative inquiry and research design: Choosing among five approaches*. 4th ed. Thousand Oaks: Sage Publications.

Cresswell, J.W. and Poth, C.N. 2024. *Qualitative inquiry and research design: Choosing among five approaches*. 5th ed. Thousand Oaks, CA: Sage Publications.

Cresswell, K.M., Sheikh, A., Krasuska, M., Heeney, C., Franklin, B.D., Lane, W., Mozaffar, H., Mason, K., Eason, S., Hinder, S., Potts, H. and Williams, R. 2019. Reconceptualising the digital maturity of health systems. *The Lancet Digital Health*, 1(5), pp. e200-e201. https://doi.org/10.1016/S2589-7500(19)30083-4

Crotty, M. 1998. *The foundations of social research: Meaning and perspective in the research process*. London: Routledge. https://doi.org/10.4324/9781003115700

Cuadros, D.F., Kiragga, A., Tu, L., Awad, S., Bwanika, J.M. and Musuka, G. 2025. Unpacking social and digital determinants of health in Africa: A narrative review on challenges and opportunities. *Mhealth*, 11, article no: 41. https://doi.org/10.21037/mhealth-24-73

Davis, F.D. 1989. Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), pp. 319-340. https://doi.org/10.2307/249008

Day, C. and Gray, A. 2023. Health and related indicators. In: South African Health Review 2022/23. Durban: Health Systems Trust, pp. 1–18.

Deloitte. 2025. *Global health care outlook*. *Investing in healthcare infrastructure*. Available at: https://www.deloitte.com/us/en/insights/industry/health-care/life-sciences-and-health-care-industry-outlooks/2025-global-health-care-executive-outlook.html [Accessed 23 January 2026].

Denzin, N.K. and Lincoln, Y.S. 2017. *The SAGE handbook of qualitative research*. 5th

ed. Los Angeles: Sage Publications.

Denzin, N.K., Lincoln, Y.S., Giardina, M.D. and Cannella, G.S. eds. 2024. *The SAGE handbook of qualitative research*. 6th ed. Thousand Oaks, CA: Sage.

de Villiers, D., Mokoena, T., Naidoo, P., Jacobs, L., Sithole, R. and Daniels, K. 2025. The usability of an electronic health record in a public healthcare facility in South Africa. *South African Medical Journal*, 115(11). https://www.scielo.org.za/scielo.php?script=sci_arttext&pid=S0256-95742025001200011 [Accessed 10 January 2026].

Discovery Health. 2023. Remote monitoring outcomes: Chronic disease management in South African private healthcare. Johannesburg: Discovery Health. Available at: https://www.discovery.co.za/wcm/discoverycoza/assets/medical-aid/benefit-information/2023/connected-care-benefit-guide.pdf [Accessed 23 January 2026].

Dixon, B.E., Holmgren, A.J., Adler-Milstein, J. and Grannis, S.J. 2022. Health information exchange and interoperability. In: J.T. Finnell, and B.E. Dixon, eds. *Clinical informatics study guide*. Cham: Springer. https://doi.org/10.1007/978-3-030-93765-2_14

Dömbekci, H.A., Güzel, Ş., Sağlam, Ş. and Ege, K. 2025. The role of digital health technologies in the healthcare marketing process. *Journal of Mehmet Akif Ersoy University Economics and Administrative Sciences Faculty*, 12(2), pp. 705-723. https://doi.org/10.30798/makuiibf.1608914

Dorsey, E.R. and Topol, E.J. 2020. Telemedicine 2020 and the next decade. *The Lancet*, 395(10227), pp. 859-860. https://doi.org/10.1016/S0140-6736(20)30424-4

Douma, M.C., Ben Rejeb, M., Zardou, N., Brahami, A., Chouchene, H., Bouallegue, O. and Latiri, H.S. 2024. Impact of implementing electronic nursing records on quality and safety indicators in care. *Libyan Journal of Medicine*, 19, 2421625. https://doi.org/10.1080/19932820.2024.2421625

Econex. 2023. *South Africa's private healthcare market: Structure, costs and access*. Pretoria: Econex.

Erku, D.A., Khatri, R., Endalamaw, A., Wolka, E., Nigatu, F., Zewdie, A. and Assefa, Y. 2023. Digital health interventions to improve access to and quality to primary health care services: A scoping review. *International Journal of Environmental*

Research and Public Health, 20(19), article no: 6854. https://doi.org/10.3390/ijerph20196854

Expatica. 2025. The healthcare system in South Africa. Updated 25 June 2025. Available at: https://www.expatica.com/za/healthcare/healthcare-basics/healthcare-in-south-africa-105896/ [Accessed 10 January 2026].

Eysenbach, G. 2001. What is e-health? *Journal of Medical Internet Research*, 3(2), article no: 20. https://doi.org/10.2196/jmir.3.2.e20

Finnegan, H. and Mountford, N. 2025. 25 years of electronic health record implementation processes: Scoping review. *Journal of Medical Internet Research*, 27(1), article no: e60077. https://doi.org/10.2196/60077

Gagnon, M.P., Orruño, E., Asua, J., Abdeljelil, A.B. and Emparanza, J. 2012. Using a modified technology acceptance model to evaluate healthcare professionals' adoption of a new telemonitoring system. *Telemedicine and e-Health*, 18(1), pp. 54-59. https://doi.org/10.1089/tmj.2011.0066

Ganguly, S., Zeichner, E.H., Reuter, S., Castellano, C., Liu Lam, O. and Gooding, H.C. 2023. No Fear, Near Peer; A Student Led Introduction to EMR. Available at: https://jintersections.org/wp-content/uploads/2023/12/12.12.23-Gooding.Final_.pdf [Accessed 16 January 2026].

Garner-Jones, L.K. 2025. Electronic health records and clinical decision support. In: *Nursing informatics and communication essentials. The impact on patient outcomes*. Ogden, UT: Weber State University.

Gartner. (2024). Predicts 2024: Healthcare delivery, AI's proving grounds. Stamford, CT: Gartner, Inc. Retrieved from Gartner Research Portal. https://persivia.com/gartners-prediction-for-ai-in-healthcare-2024/

Ghiwaa, T., Khan, I., White, M. and Beloff, N. 2023. Telemedicine adoption for healthcare delivery: A systematic review. *International Journal of Advanced Computer Science and Applications*, 14(11), pp. 1230-1243. https://dx.doi.org/10.14569/IJACSA.2023.01411125

Graber, M.L., Siegal, D., Riah, H., Johnston, D. and Kenyon, K. 2019. Electronic health record–related events in medical malpractice claims. *Journal of Patient Safety*, 15(2), pp. 77-85. https://doi.org/10.1097/PTS.0000000000000240 [Accessed 23 January 2026].

Grass, K. 2024. The three logics of qualitative research: Epistemology, ontology, and

methodology in political science. *American Journal of Qualitative Research*, 8(1), pp. 42–56. Available at: https://doi.org/10.29333/ajqr/14083

Green Paper. 2011. *National Health Act: National Health Insurance Policy: Towards Universal Health Coverage*. Pretoria: Government Printer. Available at: https://www.gov.za/documents/national-health-act-national-health-insurance-policy-towards-universal-health-coverage-30 [Accessed 24 January 2026].

Greenhalgh, T., Wherton, J., Papoutsi, C., Lynch, J., Hughes, G., Hinder, S., Fahy, N., Procter, R. and Shaw, S. 2017. Beyond adoption: A new framework for theorising and evaluating non-adoption, abandonment, and challenges to the scale-up, spread, and sustainability of health and care technologies. *Journal of Medical Internet Research*, 19(11), article no: e367. https://doi.org/10.2196/jmir.8775

Greenhalgh, T., Wherton, J., Papoutsi, C., Lynch, J. and Hughes, G. 2023. Beyond adoption: A new framework for theorising sustainability of digital health innovations. *The Lancet Digital Health*, 5(6), pp. e364–e372. https://doi.org/10.1016/S2589-7500(23)00094-9

Guba, E.G. and Lincoln, Y.S. 1994. Competing paradigms in qualitative research. In: N.K. Denzin and Y.S. Lincoln, eds. *Handbook of qualitative research*. Thousand Oaks: Sage Publications, pp. 105-117.

Guba, E.G. and Lincoln, Y.S. 2008. Paradigmatic controversies, contradictions and emerging confluences. In: N.K. Denzin and Y.S. Lincoln, eds. *The landscape of qualitative research.* 3rd ed. London: Sage Publications, Inc. pp. 255-286.

Guest, G., Bunce, A. and Johnson, L. 2006. How many interviews are enough? An experiment with data saturation and variability. *Field Methods*, 18(1), pp. 59-82. https://doi.org/10.1177/1525822X05279903

Halamka, J.D., Tripathi, M. and Hashimoto, D.A. 2022. Blockchain for health data: The implementation challenge. *NEJM Catalyst*, 4(2).

Hamad, M.M.E. and Bah, S. 2022. Impact of implementing electronic health records on medication safety at an HIMSS Stage 6 hospital: The pharmacist's perspective. *Canadian Journal of Hospital Pharmacy*, 75(4), pp. 267–275. https://doi.org/10.4212/cjhp.3223

Harerimana, A., Wicking, K., Biedermann, N., Yates, K., Pillay, J.D. and Mchunu, G. 2025. Adoption of electronic health records by nurses in Africa: A scoping

review. Digital Health, 11, article no: 20552076251357401. https://doi.org/10.1177/20552076251357401

Harris, B., Goudge, J., Ataguba, J.E., McIntyre, D., Nxumalo, N., Jikwana, S. and Chersich, M. 2011. Inequities in access to health care in South Africa. *Journal of Public Health Policy*, 32(S1), pp. S102-S123. https://doi.org/10.1057/jphp.2011.35

Health and Welfare Sector Education and Training Authority. 2023. *Digital skills audit of South African healthcare workforce*. Pretoria: HWSETA. Available at: https://www.hwseta.org.za/# [Accessed 26 January 2026].

Health Professions Council of South Africa. 2023. *Ethical guidelines on the use of artificial intelligence in healthcare: Booklet 20*. Pretoria: HPCSA. Available at: https://www.hpcsa.co.za/Uploads/editor/UserFiles/downloads/publications/Booklet%2020.pdf [Accessed 26 January 2026].

Health Systems Trust. 2023. *National health facility assessment report*. Durban: HST. Available at: https://www.hst.org.za/publications/Annual%20Reports/HST%20AR%202022%202 023%20Final.pdf [Accessed 26 January 2026].

Health Systems Trust. 2024. *South African Health Review 2023/24*. Durban: Health Systems Trust. Available at: https://www.hst.org.za/sahr [Accessed 25 January 2026].

Herselman, M. and Ruxwana, N. 2019. Building an enabling environment for eHealth in South Africa. In: M. Mars and R. Scott, eds. *Digital health in South Africa*. Cham: Springer, pp. 37-52.

HL7 International. 2023. HL7 FHIR Release 5 (v5.0.0). Available at: https://hl7.org/fhir/R5/ [Accessed on 11 January 2026].

Information Regulator of South Africa. 2023 *Guidance note on the processing of health and special personal information under POPIA*. Johannesburg: Information Regulator. Available at: https://inforegulator.org.za/wp-content/uploads/2020/07/PAIA-Manual-NOV-2023-English-Updated.docx.pdf [Accessed 25 January 2026].

In On Africa (IOA). 2024. *South Africa's healthcare industry 2024*. Johannesburg: IOA. Available at: https://cisp.cachefly.net/assets/articles/attachments/93824_south-africas-healthcare-industry-2024.pdf [Accessed 03 January 2026].

Intercare. 2024. Intercare Medical & Dental Centres – Private Healthcare Services. Available at: https://www.intercare.co.za/

International Citizens Insurance. 2025. *The healthcare system in South Africa*. Available at: https://www.internationalinsurance.com/countries/south-africa/healthcare/?srsltid=AfmBOooO-Vr5nI-QXhsg5fxog0UXF-paT5-THejsFtJQI9SXolekwAy4 [Accessed 25 January 2026].

Janneker, W. 2025. The role of AI in transforming healthcare in South Africa. *South African Medical Journal*, 115(5b), e3672. https://doi.org/10.7196/SAMJ.2025.v115i5b.3672

Jennett, P., Jackson, A., Healy, T., Ho, K., Kazanjian, A., Woollard, R., Haydt, S. and Bates, J. 2003. A study of a rural community's readiness for telehealth. *Journal of Telemedicine and Telecare*, 9(5), pp. 259-263. https://doi.org/10.1258/135763303769211265

Jose, A., Mac Cawley, A., Gaete, L.E., Tortorella, G.L., Vassolo, R., Kumar, M., Rich, N. and Kumar, M. 2025. Determinants of ICT adoption and performance in healthcare: The role of organizational and contextual factors. *IEEE Access*, 13, pp. 22535-22550. https://doi.org/10.1109/ACCESS.2025.3536089

Kaswa, R. and von Pressentin, K. 2025. Primary health care strengthening through the lens of healthcare system thinking. *South African Family Practice*, 67(1), article no. a6039. https://doi.org/10.4102/safp.v67i1.6039

Keesara, S., Jonas, A. and Schulman, K. 2020. Covid-19 and health care's digital revolution. *The New England Journal of Medicine*, 382(23), article no: e82. https://oi.org/10.1056/NEJMp2005835

Khan, R., Khan, S., Almohaimeed, H.M., Almars, A.I. and Pari, B. 2025. Utilisation, challenges, and training needs of digital health technologies: Perspectives from healthcare professionals. *International Journal of Medical Informatics*, 197, article no: 105833. https://doi.org/10.1016/j.ijmedinf.2025.105833

Khoja, S., Durrani, H., Scott, R.E., Sajwani, A. and Piryani, U. 2013. Conceptual framework for development of comprehensive e-health evaluation tool. *Telemedicine and e-Health*, 19(1), pp. 48-53. https://doi.org/10.1089/tmj.2012.0073

Khumalo, M.H. and Moloi, T.S. 2025. Barriers to digital transformation in Gauteng's municipal healthcare: the case of electronic health records. *Journal of Local*

Government Research and Innovation, 6, article no: a282. https://doi.org/10.4102/jolgri.v6i0.282

Kredo, T., et al. 2022. Health technology assessment in support of national health insurance in South Africa. *International Journal of Technology Assessment in Health Care*, 38(1), e44. Available at: https://doi:10.1017/S0266462322000265

Kruse, C.S., Kothman, K., Anerobi, K. and Abanaka, L. 2016. Adoption factors of the electronic health record: A systematic review. *JMIR Medical Informatics*, 4(2), article no: e19. https://doi.org/10.2196/medinform.5525

Li, S., Zhou, Y., Tang, Y., Ma, H., Zhang, Y., Wang, A., Tang, X., Pei, R. and Piao, M. 2025. Behavior change resources used in mobile app–based interventions addressing weight, behavioral, and metabolic outcomes in adults with overweight and obesity: Systematic review and meta-analysis of randomized controlled trials. *JMIR mHealth and uHealth*, 13, article no. e63313. https://doi.org/10.2196/63313

Lincoln, Y.S. and Guba, E.G. 1985. *Naturalistic inquiry*. Thousand Oaks: Sage Publications.

Longhini, J., Rossettini, G. and Palese, A. 2024. Digital health competencies and affecting factors among healthcare professionals: Additional findings from a systematic review. *Journal of Research in Nursing*, 29(2), pp. 156–176. https://doi.org/10.1177/17449871241226899

Lovemore, M. 2024. Electronic health records model to improve the quality of healthcare in South African public hospitals. *Health SA Gesondheid*, 29, article no: a2414. https://doi.org/10.4102/hsag.v29i0.2414

Mabaso, C., Mokonyama, R. and Mitonga-Monga, J. 2025. Attitudes and readiness of nurses towards digitalisation in resource-constrained health settings. *Curationis*, 48(1), article no: a2706. https://doi.org/10.4102/curationis.v48i1.2706

Maphumulo, W.T. and Bhengu, B.R. 2019. Challenges of quality improvement in the healthcare of South Africa post-apartheid: A critical review. *Curationis*, 42(1), a1901. https://doi.org/10.4102/curationis.v42i1.1901

Mars, M. 2012. Building the capacity to build capacity in e-health in sub-Saharan Africa: The KwaZulu-Natal experience. *Telemedicine Journal and e-Health*, 18(1), pp. 32-37. https://doi.org/10.1089/tmj.2011.0146

Mayosi, B.M., Lawn, J.E., van Niekerk, A., Bradshaw, D., Abdool Karim, S.S. and Coovadia, H.M. 2012. Health in South Africa: changes and challenges since 2009. *The Lancet*, 380(9858), pp. 2029-2043. https://doi.org/10.1016/S0140-6736(12)61814-5

Mbonane, H., Sibanda, M., Godman, B., Meyer, J.C. and Matlala, M. 2024. Knowledge, attitudes and practices of healthcare professionals on the use of an electronic stock visibility and management tool in a middle-income country: Implications for access to medicines. *Scientific African*, 23, e02045. https://doi.org/10.1016/j.sciaf.2024.e02045

McGonigle, D. and Mastrian, K.G. 2022. *Nursing informatics and the foundation of knowledge*. 5th ed. Burlington, MA: Jones & Bartlett Learning.

Mertens, D.M. 2015. *Research and evaluation in education and psychology: Integrating diversity with quantitative, qualitative, and mixed methods*. 4th ed. Thousand Oaks, CA: Sage Publications.

Mills, A., Ataguba, J.E., Akazili, J., Borghi, J., Garshong, B., Makawia, S., Mtei, G., Harris, B., Macha, J., Meheus, F. and McIntyre, D. 2012. Equity in financing and use of health care in Ghana, South Africa, and Tanzania: Implications for paths to universal coverage. *The Lancet*, 380(9837), pp. 126–133. https://doi.org/10.1016/S0140-6736(12)60357-2

Mittermaier, M., Venkatesh, K.P. and Kvedar, J.C. 2023. Digital health technology in clinical trials. *npj Digital Medicine*, 6, article no: 88. https://doi.org/10.1038/s41746-023-00841-8

Mogaji, E., Jain, V. and Sharma, H. 2024. *Qualitative research for a digital world*. London: SAGE Publications.

Mohammed, S. 2024. Cloud infrastructure transformation in healthcare: A comprehensive analysis of applications, benefits, and implementation challenges. *International Journal of Scientific Research in Computer Science, Engineering and Information Technology*, 10, pp. 1402–1409. https://doi.org/10.32628/CSEIT241061182

Mugauri, H.D., Chimsimbe, M., Shambira, G., Shamhu, S., Nyamasve, J. and Munyanyi, M. 2025. A decade of designing and implementing electronic health records in Sub-Saharan Africa: A scoping review. *Global Health Action*, 18(1), article no: 2492913. https://doi.org/10.1080/16549716.2025.2492913

Musakuro, R.N. and Gie, L. 2025. Strategies for sustainable adoption of e-health tools for digital mental health services. *South African Journal of Human Resource Management*, 23, article no: a3053. https://doi.org/10.4102/sajhrm.v23i0.3053

Mwansa, G., Ngandu, M.R. and Mkwambi, Z. 2025. Bridging the digital divide: exploring the challenges and solutions for digital exclusion in rural South Africa. *Discover Global Society*, 3, article no: 54. https://doi.org/10.1007/s44282-025-00189-2

National Treasury 2024. *Budget review 2024: Health sector expenditure*. Pretoria: National Treasury, Republic of South Africa. Available at: https://www.treasury.gov.za/documents/national%20budget/2024/review/FullBR.pdf [Accessed 26 January 2026].

NDoH [National Department of Health]. 2012. *National eHealth Strategy for South Africa 2012/13–2016/17*. Pretoria: Government Printer. Available at: https://caasanwebsitestorage.blob.core.windows.net/aviation-medicine-general-information/DOH%20-%20South-Africa%20eHealth%20Strategy.pdf [Accessed 26 January 2026].

NDoH [National Department of Health]. 2019. *National digital health strategy for South Africa 2019–2024*. Pretoria: National Department of Health. Available at: https://www.health.gov.za/wp-content/uploads/2020/11/national-digital-strategy-for-south-africa-2019-2024-b.pdf [Accessed 26 January 2026].

NDoH [National Department of Health]. 2022. Annual Report 2021/22. Government of South Africa. Available at https://www.gov.za/sites/default/files/gcis_document/202210/healthannualreport202122.pdf

NDoH [National Department of Health]. 2023a. *Annual report on digital health implementation*. Pretoria: Government Printer. Available at: https://knowledgehub.health.gov.za/elibrary/national-digital-health-strategy-south-africa-2019-2024 [Accessed 23 January 2026].

NDoH [National Department of Health]. 2023b. *National digital health strategy 2024–2029: Implementation framework*. Pretoria: National Department of Health. Available at: https://www.health.gov.za/wp-content/uploads/2024/10/NDoH-Annual-Report-2023-24.pdf [Accessed 26 January 2026].

NDoH [National Department of Health]. 2024. *National Digital Health Strategy for*

South Africa 2019–2024 (updated priorities). Pretoria: NDoH. Available at: https://www.health.gov.za/wp-content/uploads/2020/11/national-digital-strategy-for-south-africa-2019-2024-b.pdf [Accessed 26 January 2026].

Nene, S.E. and Hewitt, L.M. 2023. Implementing artificial intelligence in South African public hospitals: A conceptual framework. *Acta Commercii*, 23(1), a1173. https://doi.org/10.4102/ac.v23i1.1173

Nguyen, O.T., Vo, S.D., Lee, T., Cato, K.D. and Cho, H. 2024. Implementation and delivery of electronic health records training programs for nurses working in inpatient settings: a scoping review. *Journal of the American Medical Informatics Association*, 31(11), pp. 2740-2748. https://doi.org/10.1093/jamia/ocae228

Nilsen, P. and Bernhardsson, S. 2019. Context matters in implementation science: A scoping review of determinant frameworks that describe contextual determinants for implementation outcomes. *BMC Health Services Research*, 19(1), article no: 89. https://doi.org/10.1186/s12913-019-4015-3

Nilsen, P. and Birken, S.A. eds. 2025. *Handbook on implementation science*. Northampton: Edward Elgar Publishing.

Noble, H. and Smith, J. 2025. Ensuring validity and reliability in qualitative research. *Evidence-Based Nursing*, 28(4), pp. 206–208. https://doi.org/10.1136/ebnurs-2024-104232

Ogundaini, O.O. and Mlitwa, N.B.W. 2024. A situational review of national digital health strategy implementation in sub-Saharan Africa. *The Journal for Transdisciplinary Research in Southern Africa*, 20(1), a1476. https://doi.org/10.4102/td.v20i1.1476

Otto, L., Schlieter, H., Harst, L., Whitehouse, D. and Maeder, A. 2023. The telemedicine community readiness model—Successful telemedicine implementation and scale-up. *Frontiers in Digital Health*, 5, article no: 1057347. https://doi.org/10.3389/fdgth.2023.1057347

Patton, M.Q. 2015. *Qualitative research & evaluation methods: Integrating theory and practice*. 4th ed. Thousand Oaks: Sage Publications.

Patton, M.Q. 2020. *Qualitative research & evaluation methods*. 5th ed. Thousand Oaks, CA: Sage Publications.

Praha, N., Sriyuktasuth, A., Puwarawuttipanit, W., Chuengsaman, P. and

Kusakunniran, W. 2024. Factors influencing telehealth service use and health outcomes in patients undergoing continuous ambulatory peritoneal dialysis: Cross-sectional study. *JMIR Nursing*, 7, e54407

Prasad, P. 2025. Fusing AI and clinicians: Next-gen clinical decision support: Merging AI with human expertise. *University of Mysore Research Repository*, June.

Provenzano, M., Cillara, N., Curcio, F., Pisu, M.O., González, C.A. and Jiménez-Herrera, M.F. 2024. Electronic health record adoption and its effects on healthcare staff: A qualitative study of well-being and workplace stress. *International Journal of Environmental Research and Public Health*, 21(11), article no: 1430. https://doi.org/10.3390/ijerph21111430

QSR International. 2024. *NVivo 14 user guide*. Melbourne: QSR International. Available at: https://www.qsrinterna-tional.com/nvivo-qualitative-data-analysis-software/home [Accessed 26 January 2026].

Rahimi, B., Nadri, H., Lotfnezhad Afshar, H. and Timpka, T. 2018. A systematic review of the technology acceptance model in health informatics. *Applied Clinical Informatics*, 9(3), pp. 604-634 https://doi.org/10.1055/s-0038-1668091

Rangachari, P., Al Arkoubi, K., Shindi, R. 2025. A multi-level framework for advancing digital health equity in learning health systems: Aligning practice and theory with the Quintuple Aim. *International Journal for Equity in Health*, 24(1), article no: 253. https://doi.org/10.1186/s12939-025-02663-4

ResearchAndMarkets. 2025. *South Africa Healthcare Sector Report 2025*. Available at: https://www.researchandmarkets.com/reports/5781185/healthcare-services-market-report [Accessed 26 January 2026].

Rogers, E.M. 2003. *Diffusion of innovations*. 5th ed. New York: Free Press.

Ross, J., Stevenson, F., Lau, R. and Murray, E. 2016. Factors that influence the implementation of e-health: A systematic review of systematic reviews (an update). *Implementation Science*, 11(1), article no: 146. https://doi.org/10.1186/s13012-016-0510-7

Ruxwana, N.L., Herselman, M.E. and Conradie, D.P. 2010. ICT applications as e-health solutions in rural healthcare in the Eastern Cape Province of South Africa: A case study. *Health Information Management Journal*, 39(1), pp.17-29.

Saldaña, J. 2021. *The coding manual for qualitative researchers*. 4th ed. London: Sage Publications.

Sampa, M.B., Aziz, N.H.A., Rahman, M.S., Hasan, M. and Aziz, N.A.A. 2025. Factors influencing the adoption and acceptance of e-health in Malaysia: A systematic review. *Critical Public Health*, 35(1), article no: 2519780. https://doi.org/10.1080/09581596.2025.2519780

Saunders, M., Lewis, P. and Thornhill, A. 2019. *Research methods for business students*. 8th ed. New York: Pearson Education.

Saunders, M., Lewis, P. and Thornhill, A. 2023. *Research methods for business students*. 9th ed. New York: Pearson Education.

Saunders, M., Lewis, P. and Thornhill, A. 2025. *Research methods for business students*. Harlow: Pearson Education.

Schwandt, T.A. 1994. Constructivist, interpretivist approaches to human inquiry. In: N.K. Denzin and Y.S. Lincoln, eds. *Handbook of qualitative research*. Thousand Oaks: Sage Publications, pp. 118-137.

Scotland, J. 2012. Exploring the philosophical underpinnings of research: Relating ontology and epistemology to the methodology and methods of the scientific, interpretive, and critical research paradigms. English Language Teaching, 5(9), pp. 9–16. https://doi.org/10.5539/elt.v5n9p9

Scott, R.E. and Mars, M. 2015. Telehealth in the developing world: Current status and future prospects. *Smart Homecare Technology and TeleHealth*, 3, pp. 25-37. https://doi.org/10.2147/SHTT.S75184

Scott, R.E. and Mars, M. 2021. COVID-19 and eHealth: A promise or peril paradox?. *Journal of the International Society for Telemedicine and EHealth*, 9, article no: e1 (1-2). https://doi.org/10.29086/JISfTeH.9.e1

Seward, N., Murdoch, J., Hanlon, C., Araya, R., Gao, W., Harding, R., Lund, C., Hinrichs-Krapels, S., Mayston, R., Kartha, M., Prince, M., Sandall, J., Thornicroft, G., Verhey, R. and Sevdalis, N. 2021. Implementation science protocol for a participatory, theory-informed implementation research programme in the context of health system strengthening in sub-Saharan Africa (ASSET-ImplementER). *BMJ Open*, 11(7), e048742. https://doi.org/10.1136/bmjopen-2021-048742

Silver, C. and Woolf, N.H. 2017. *Qualitative analysis using NVivo: The five-level QDA® method*. 1st ed. New York: Routledge.

Silverman, D. 2020. *Interpreting qualitative data*. 6th ed. London: Sage Publications.

Simbini, T., Adimado, E., Adjorlolo, S., Guerrero-Torres, L., Srinivas, P.N., Zizhou, S. and Zerfu, T.A. 2025. Digital health interventions (DHIs) for health systems strengthening in sub-Saharan Africa: Insights from Ethiopia, Ghana, and Zimbabwe. *medRxiv* [Preprint]. https://doi.org/10.1101/2025.04.22.25326213

Solomon, J., Dauber-Decker, K., Richardson, S., Levy, S., Khan, S., Coleman, B., Persaud, R., Chelico, J., King, D.A., Spyropoulos, A. and McGinn, T. 2023. Integrating clinical decision support into electronic health record systems using a novel platform (EvidencePoint): Developmental study. *Journal of Medical Internet Research, Formative Research*, 7, article no: e44065. https://doi.org/10.2196/44065

South African Medical Research Council (SAMRC). 2024. Annual Report 2023–2024. SAMRC, Cape Town. Available at: https://www.health.gov.za/wp-content/uploads/2024/10/South-African-Medical-Research-Council-Annual-Report.pdf [Accessed 20 January 2026].

Statistics South Africa. 2023. Mid-year population estimates 2023 (Statistical Release P0302). Available at: https://www.statssa.gov.za › P0302 › P03022024 [Accessed 26 January 2026].

Staunton, C., Adams, R., Botes, M. and Dove, E.S. 2021. POPIA and health research in South Africa. *South African Journal of Science*, 119(3/4).

Staunton, C., Slokenberga, S. and Mascalzoni, D. 2022. Appropriate safeguards and article 89 of the GDPR: Considerations for biobank, databank and genetic research. *Frontiers in Genetics*, 13, article no: 719317. https://doi.org/10.3389/fgene.2022.719317

Steenkamp, I., Peltonen, L.M. and Chipps, J. 2025. Digital health readiness – insights from healthcare leaders in operational management: A cross-sectional survey. *BMC Health Services Research, 25(1)*, article no: 240. https://doi.org/10.1186/s12913-024-12129-y

Sylla, B., Ismaila, O. and Diallo, G. 2025. Twenty-five years of digital health toward universal health coverage in low- and middle-income countries: A rapid systematic review. *Journal of Medical Internet Research*, 27, article no: e59042. https://doi.org/10.2196/59042

The Beryl Institute. 2024. Stories that transform: A guide to storytelling in healthcare. Available at: https://theberylinstitute.org/wp-

content/uploads/2024/10/TBI_Storytelling_Guidebook.pdf> [Accessed 26 January 2026].

Topol, E.J. 2019. Deep medicine: How artificial intelligence can make healthcare human again. New York: Basic Books.

Torab Miandoab, A., Basiri, M., Dabbagh Moghaddam, A. and Gholamhosseini, L. 2025. Electronic health record in military healthcare systems: A systematic review. PLOS ONE, 20(2), e0313641. https://doi.org/10.1371/journal.pone.0313641

Tsai, C.H., Eghdam, A., Davoody, N., Wright, G., Flowerday, S. and Koch, S. 2020. Effects of electronic health record implementation and barriers to adoption and use: A scoping review and qualitative analysis of the content. *Life*, 10(12), article no: 327. https://doi.org/10.3390/life10120327

Tsegaye, T. and Flowerday, S. 2021. A system architecture for ensuring interoperability in a South African national electronic health record system. *South African Computer Journal*, 33(1), pp. 79-110. https://doi.org/10.18489/sacj.v33i1.838

Van den Heever, A. 1998. Private sector health reform in South Africa. *Health Economics*, 7(4), pp. 281-289. https://doi.org/10.1002/(sici)1099-1050(199806)7:4<281::aid-hec355>3.0.co;2-z

Venkatesh, V., Morris, M.G., Davis, G.B. and Davis, F.D. 2003. User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 27(3), pp. 425-478. https://doi.org/10.2307/30036540

Venkatesh, V., Thong, J.Y. and Xu, X. 2012. Consumer acceptance and use of information technology: Extending the unified theory of acceptance and use of technology. *MIS Quarterly*, 36(1), pp. 157–178. https://doi.org/10.2307/41410412

Vial, G. (2021). Understanding digital transformation: A review and a research agenda. In A. Hinterhuber, T. Vescovi & F. Checchinato (Eds.), Managing digital transformation: Understanding the strategic process (pp. 13–66). Routledge.

Wallis, L., Blessing, P., Dalwai, M. and Shin, S.D. 2021. Integrating mHealth at point of care in low- and middle-income settings: The system perspective. *Global Health Action*, 10(sup3), article no: 1327686. https://doi.org/10.1080/16549716.2017.1327686

Wang, M., Huang, K., Li, X., Zhao, X., Downey, L., Hassounah, S., Liu, X., Jin, Y. and Ren, M. 2024. Health workers' adoption of digital health technology in low- and middle-income countries: A systematic review and meta-analysis. *Bulletin of the World Health Organization* (Online First). Available at: https://cdn.who.int/media/docs/default-source/bulletin/online-first/blt.24.292157.pdf [Accessed on 20 December 2025].

WHO [World Health Organisation]. 2023. *Global strategy on digital health 2020–2025: Implementation update*. Geneva: World Health Organisation. Available at: https://www.who.int/docs/default-source/documents/gs4dhdaa2a9f352b0445bafbc79ca799dce4d.pdf [Accessed 26 January 2026].

WHO [World Health Organisation]. 2025. *Digital health and health systems resilience: Global policy update*. Geneva: World Health Organisation. Available at: https://www.who.int/health-topics/digital-health#tab=tab_1 [Accessed 26 January 2026].

WHO [World Health Organisation]. 2025b. *Universal health coverage country profile: South Africa*. Geneva: World Health Organisation. Available at: https://www.who.int/news-room/fact-sheets/detail/universal-health-coverage-(uhc) [Accessed 26 January 2026].

Wiesche, M., Jurisch, M.C., Yetton, P.W. and Krcmar, H. 2017. Grounded theory methodology in information systems research. *MIS Quarterly*, 41(3), pp. 685–701. https://doi.org/10.25300/MISQ/2017/41.3.02

World Bank 2024a. *Digital transformation in health: Enablers, governance and workforce readiness*. Washington, DC: World Bank. Available at https://www.worldbank.org/en/topic/digital/overview [Accessed 26 January 2026].

World Bank 2024b. *South Africa public expenditure review: Health sector update*. Estimates of National Expenditure 2023. Washington, DC: World Bank. Available at: https://www.treasury.gov.za/documents/national%20budget/2023/ene/Vote%2018%20Health.pdf [Accessed 26 January 2026].

Ye, J., He, L. and Beestrum, M. 2023. Implications for implementation and adoption of telehealth in developing countries: A systematic review of China's practices and

experiences. N74. *Digital Medicine*, 6, article no: 174. https://doi.org/10.1038/s41746-023-00908-6

Yi, S., Yam, E.L.Y., Cheruvettolil, K., Linos, E., Gupta, A., Palaniappan, L., Rajeshuni, N., Vaska, K.G., Schulman, K. and Eggleston, K.N. 2024. Perspectives of digital health innovations in low- and middle-income health care systems from South and Southeast Asia. *Journal of Medical Internet Research*, 26, article no: e57612. https://doi.org/10.2196/57612

Zharima, C., Griffiths, F. and Goudge, J. 2023. Exploring the barriers and facilitators to implementing electronic health records in a middle-income country: a qualitative study from South Africa. *Frontiers in Digital Health*, 5, article no: 1207602. https://doi.org/10.3389/fdgth.2023.1207602

Appendix A: Ethical Clearance Letter

THE INDEPENDENT INSTITUTE OF EDUCATION

Our Ref: M. 1180625
Enquiries: research@iie.ac.za

03 June 2025

Outcome of Ethical Clearance for Master of Business Administration.

Student name: Thabiso Masilo Rampedi
Student number: [redacted]
Brand and campus: IIEMSA

Dear Thabiso,

Thank you for submitting ethics clearance for the study titled: ***Factors Influencing eHealth Adoption Potential in a Private Hospital in Soshanguve.***

We are pleased to inform you that the IIE's Higher Degrees Committee considered and granted conditional ethical clearance with minor revisions.

Please note that due to the high similarity index reflected in both the Turnitin report and AI report, the supervisor must sign off on the revised proposal and submit a motivation to the HDC for the acceptance of the high AI score similarity report before you may proceed with data collection.

You are reminded to inform the IIE's Higher Degrees Committee of any changes made to the research methodology or title of the research prior to examination. Kindly ensure that all ethical considerations are duly applied whilst collecting, analysing and interpreting the data for the completion of your research.

If you have any questions, please feel free to contact your programme team or supervisor directly

All the best with your research studies.

[redacted]

Dr Reza Hosseini

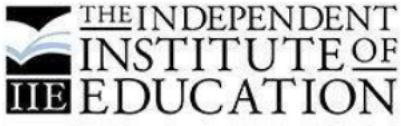
Chair: Higher Degrees Committee

Appendix B: Gatekeeper Permission Letter

Annexure O – Gatekeeper's letter (institutional consent form) 2025

Consent form to conduct research at company/organisation/association	
I [redacted] in my capacity as [redacted] grant permission Thabiso Masilo Rampedi to conduct research at the [redacted] pending the outcome of the ethics committee of the IIE on the envisaged research. The student may only engage with members of the organisation/ company/ association if they can produce the Ethics Letter from the IIE. This research has been explained to me and I understand what participation in this research will involve for the people I represent. I also reserve the right to remind the people I represent that their participation in this study is completely voluntary and that this permission does not imply their participation. I reserve the right to withdraw this permission at any time. I also understand that research reports are made available in IIE Libraries as well as on the IIE Repository. The below conditions must be applied whilst writing up the research report:	
Conditions concerning the anonymity of the company/organisation/association:	
The company/organisation/association must be kept anonymous in the research report.	☒
The company/organisation/association may be identified in the research report.	☐
Conditions concerning the publication of the research report:	
The research report will be made available on the IIE Repository...	
Immediately after completion.	☐
After a specified number of months has elapsed.	☒
Number of months, if selected:	6 months
[redacted]	29/8/2025
Signature	Date

Appendix C: Participant's Consent Template



Annexure H – PARTICIPANT OR RESPONDENT INFORMED CONSENT FORM

Explanatory information sheet and consent form for participants
To whom it may concern, My name is Thabiso Masilo Rampedi, and I am a student at The IIE's Monash South Africa (MSA). I am currently conducting research under the supervision of Ms. Dominique Nupen about the factors influencing the adoption potential among healthcare professionals in a semi-urban private hospital in Soshanguve, with a focus on the possible implementation of an Electronic Health Records (EHRs) eHealth system. I hope that this research will enhance our understanding of context-specific factors influencing successful eHealth implementation, specifically Electronic Health Records, in resource-limited hospital settings. I would like to invite you to participate in my study. In order to explain to you what your participation in my study will involve, I have formulated questions that I will try to fully answer so that you can make an informed decision about whether or not to participate. If you have any additional questions that you feel are not addressed or explained in this information sheet, please do not hesitate to ask me for more information. Once you have read and understood all the information contained in this sheet and are willing to participate, please complete and sign the consent form below.
What will I be doing if I participate in your study?
I would like to invite you to participate in this research because you are a healthcare professional working at a private hospital in Soshanguve where an EHRs eHealth system is being considered for future implementation. If you decide to participate in this research, you will take part in a semi-structured interview. The interview will focus on your perceptions of digital systems, current readiness, and potential factors that may influence your adoption potential, should the EHRs eHealth system be implemented. You can decide whether or not to participate in this research. If you decide to participate, you can choose to withdraw at any time or to decide not to answer particular interview questions.
Are there any risks/ or discomforts involved in participating in this study?

Whether or not you decide to participate in this research, there will be no negative impact on you. There are no direct risks or benefits to you if you participate in this study. You might, however, indirectly find that it is helpful to talk about your experiences and perceptions related to the implementation of new healthcare technologies. If you find at any stage that you are not comfortable with the line of questioning, you may withdraw or refrain from participating.

Detail the potential risks and how it will be managed by the researcher. Indicate how the ethical considerations will be applied in the context of the study.

Do I have to participate in the study?
• Your inclusion in this study is completely voluntary; • If you do not wish to participate in this study, you have every right not to do so; • Even if you agree to participate in this study, you may withdraw at any time without having to provide an explanation for your decision.
Will my identity be protected?
I promise to protect your identity, as well as the identity of the private hospital. I will not use your name in any research summaries to come out of this research and I will also make sure that any other details are disguised so that nobody will be able to identify you. I would like to ask your permission to record the interviews, but only my supervisor, I and possibly a professional transcriber (who will sign a confidentiality agreement) will have access to these recordings. Nobody else, including anybody at Monash South Africa (MSA), will have access to your interview information. I would like to use quotes when I discuss the findings of the research, but I will not use any recognisable information in these quotes that can be linked to you.
What will happen to the information that participants provide?
Once I have finished all interviews, I will write summaries to be included in my research report, which is a requirement to complete my Master of Business Administration. You may ask me to send you a summary of the research if you are interested in the final outcome of the study.
What happens if I have more questions about the study?

Please feel free to contact me or my supervisor should you have any questions or concerns about this research, or if there is anything you need to know before you decide whether or not to participate.

You should not agree to participate unless you are completely comfortable with the procedures followed.

My contact details are as follows:
Thabiso Masilo Rampedi [redacted]
[redacted]

The contact details of my supervisor are as follows: Ms Dominique Nupen
[redacted]
[redacted]

Participant or respondent Informed Consent – Audio and Visual Recordings.
I agree to participate in the research conducted by [INSERT YOUR FULL NAMES AND SURNAME] about the factors influencing the potential adoption of eHealth among healthcare professionals in a semi-urban private hospital in Soshanguve. This research has been explained to me and I understand what participation in this research will involve. I understand that: • I agree to participate in this research and be recorded for the purpose of data collection. • My confidentiality will be ensured. My name and personal details will be kept private and confidential. • My participation in this research is voluntary and I have the right to withdraw from the research at any time. There will be no repercussions should I choose to withdraw from the research. • I may choose not to answer any of the questions that are asked during the research interview. • I may be quoted directly when the research is published, but my identity will be protected.

Signature	Date

Appendix D: Language Editing Certificate

info@topacademicediting.co.za

info@topscience.co.za

CERTIFICATE OF LANGUAGE EDITING

Factors Influencing eHealth Adoption Potential in a Private Hospital in Soshanguve

By

Thabiso Masilo Rampedi

Has been edited by

Dr SH Taylor (PhD)

The focus was on correcting grammar, spelling and punctuation, and ensuring the document was formatted according to the stipulated guidelines

27 January 2026

Professional EDITORS Guild 30+ Est 1993

Sarah Taylor
Associate Member

Membership number: TAY007
Membership year: March 2025 to February 2026

083 450 0378

www.editors.org.za

Disclaimer

I do my best to ensure that all errors relating to language (grammar, punctuation and spelling) and consistency are resolved. The author is responsible for checking the document and accepting or rejecting the suggestions made through track changes. I am not responsible for any issues arising from subsequent amendments to the document by the author.

Appendix E: Certificate of Release

ANNEXURE F – CERTIFICATE OF RELEASE (IIE007)

Select the relevant category for which the Certificate of Release is submitted for.

1. Academic Seminar	☐
2. Proposal submission to the Higher Degrees Committee	☐
3. Submission of Dissertation or Thesis for examination.	☒

Students submitting a Master's or Doctoral Proposal, Dissertation, or Thesis should complete Part 1 of this form and send an electronic copy to their supervisor and co-supervisor, who then have to share it with the National Higher Degrees Programme Manager.

PART 1	Student
Names:	Thabiso
Surname:	Rampedi
Student number:	[redacted]
Email:	[redacted]
Contact number:	[redacted]
Degree:	MBA
Title of Study:	Factors Influencing eHealth Adoption Potential in a Private Hospital in Soshanguve

I confirm that my dissertation has been prepared in accordance with the guidelines of The Independent Institute of Education on the submission of a Master's dissertation.

[redacted]	27/01/2026
Signature of candidate	Date

PART 2	Supervisor and co-supervisor
Supervisor title, first and last names:	
Co-supervisor title first and last names:	

I confirm that the candidate's dissertation has been prepared to my satisfaction and in accordance with the guidelines of The Independent Institute of Education on the submission of a Master's dissertation.

[redacted]	27/01/2026
Signature of supervisor	Date
N/A	
Signature of co-supervisor	Date

Appendix F: Example of tree diagrams showing the nodes (factors) and key themes (child nodes) with reference counts

System usefulness (35) |
- ├— Perceived efficiency gains (8)
- ├— Improved service quality (7)
- ├— Ease-of-use (6)
- ├— Data-driven decision-making (5)
- ├— Resistance to change management (5)
- └— Additional desired features (4)

Trialability (35) |
- ├— Critical importance (10)
- ├— Expectations for success (10)
- ├— Context-specific needs (8)
- ├— Influence on adoption (7)

Facilitating conditions (38) |
- ├— Financial barriers (9)
- ├— IT infrastructure gaps (8)
- ├— Training needs (7)
- ├— Cybersecurity & compliance (7)
- └— Workflow integration challenges (7)

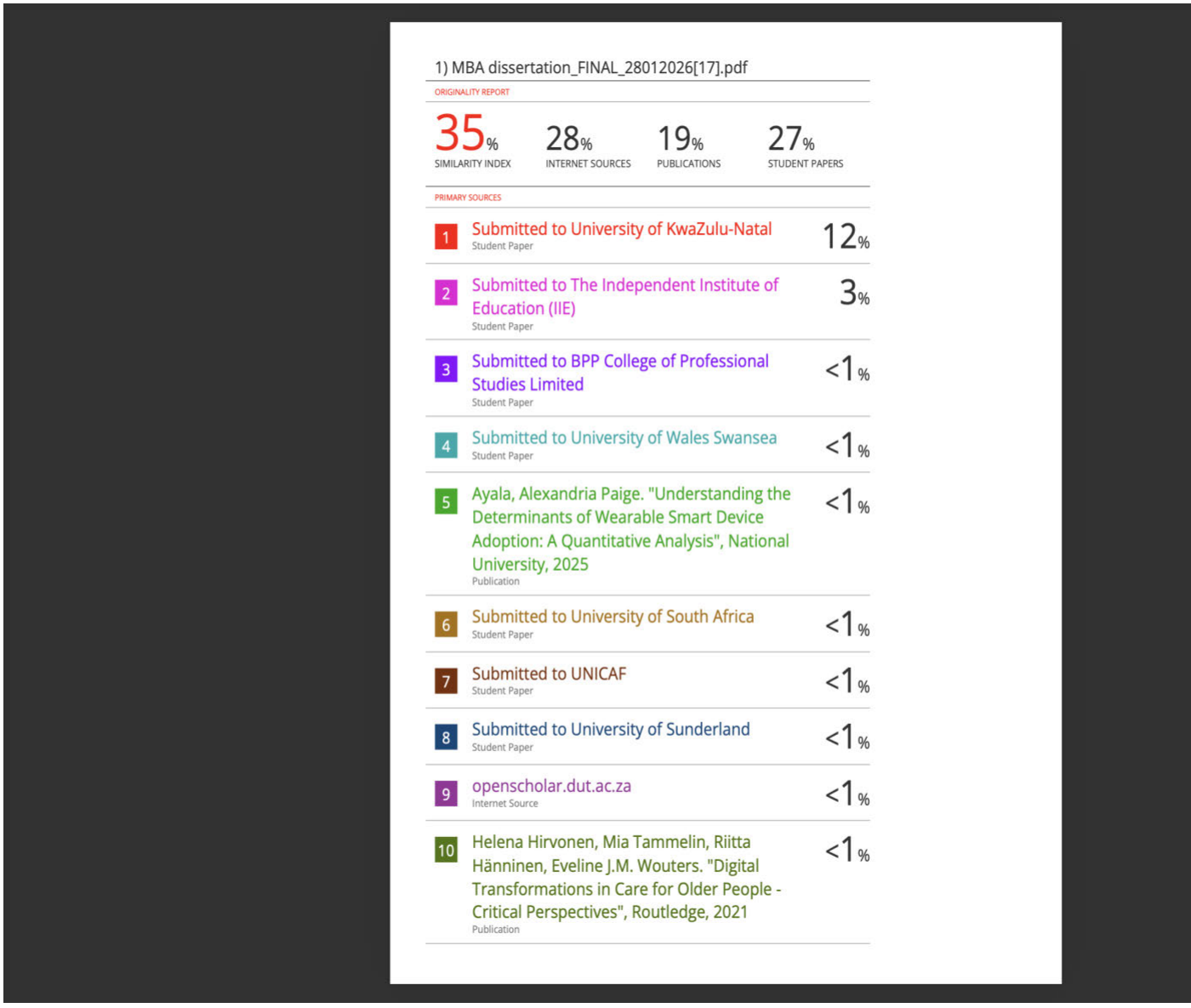
Technological infrastructure (35) |
- ├— Hardware & device gaps (8)
- ├— Network reliability issues (7)
- ├— System integration challenges (7)
- ├— Cybersecurity & data storage concerns (7)
- └— Space & workflow design conflicts (6)

Staff training (39) |
- ├— Structured training necessity (9)
- ├— Barriers to training access (8)
- ├— Addressing varying digital skills (7)
- ├— Need for ongoing support (7)
- └— Training quality influences adoption (8)

Social factors (36) |
- ├— Leadership buy-in as critical driver (10)
- ├— Peer influence & social proof (9)
- ├— Organisational culture & resistance to change (7)
- ├— Perceived benefits as motivator (6)
- └— Hierarchy of influence in adoption (4)

Appendix G: TurnItIn Report

Excluding previous submissions and formal IIE templates, all similarity scores are below 1%.



1) MBA dissertation_FINAL_28012026[17].pdf

ORIGINALITY REPORT

35%	28%	19%	27%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	Submitted to University of KwaZulu-Natal Student Paper	12%
2	Submitted to The Independent Institute of Education (IIE) Student Paper	3%
3	Submitted to BPP College of Professional Studies Limited Student Paper	<1%
4	Submitted to University of Wales Swansea Student Paper	<1%
5	Ayala, Alexandria Paige. "Understanding the Determinants of Wearable Smart Device Adoption: A Quantitative Analysis", National University, 2025 Publication	<1%
6	Submitted to University of South Africa Student Paper	<1%
7	Submitted to UNICAF Student Paper	<1%
8	Submitted to University of Sunderland Student Paper	<1%
9	openscholar.dut.ac.za Internet Source	<1%
10	Helena Hirvonen, Mia Tammelin, Riitta Hänninen, Eveline J.M. Wouters. "Digital Transformations in Care for Older People - Critical Perspectives", Routledge, 2021 Publication	<1%