EFFECTIVE UTILISATION OF HUMAN RESOURCE INFORMATION SYSTEMS IN THE SOUTH AFRICAN HEALTH SECTOR

by

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DECLARATION

I, **Emmanuel Udekwe**, declare that the contents of this thesis represent my own unaided work and that the thesis has not previously been submitted for academic examination towards any qualification. Furthermore, it represents my own opinions and not necessarily those of the Cape Peninsula University of Technology.

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ABSTRACT

Human Resource Information Systems (HRIS) are considered change facilitators that enable organisations to achieve competitive advantage. The need for effective HR practices in the health sector is high, which has led to various research endeavours. Interestingly, even though the benefit of using an HRIS in the health sector has been significantly researched, determining how HRIS can be effectively utilised for workforce management and retention strategy in the public health sector of South Africa is yet to be accomplished.

In South Africa, many would argue that the public health sector is in a state of severe decline. HRIS can contribute to better service delivery in this sector.

The research questions for this study are: What are the factors that hinder the effective utilisation of HRIS within the public health sector? What impact does HRIS usage have on monitoring and retention of the skilled workforce in the public health sector? How can HRIS be utilised to assist the public health sector to improve its services to the public?

To descriptively explore these questions, a mixed method research approach was used. The methodological approach consisted of semi-structured interviews and questionnaires for data collection, while analysis was carried out using ATLAS-ti and the Statistical Package for the Social Sciences (SPSS) software. ATLAS-ti was used to analyse qualitative data, which assisted in the emergence of significant themes/keywords upon which critical discussions focused; SPSS was used for the quantitative data. Several crucial findings emerged from the study.

The study adopted Innovation Diffusion Theory, Knowledge-Based Theory and the Technology Organisational and Environmental (TOE) Framework to develop a Managerial, Technological and External (MTE) Factors Framework for effective use of HRIS technology in the health sector. Non-probability purposive sampling methods were used to identify participants, which included HR, IT, healthcare professionals and hospital management. Ultimately the study describes the connection between effective HRIS and workforce management to transform the outcomes of technology-based HR processes for service delivery in health.

The study finds that the HRIS used in the public health sector of the Western Cape, South Africa is named PERSAL, based on outdated, primitive, and irregularly updated technology. Further findings are numerous factors that constrain the effective use of HRIS in the public health sector. These factors include, among others, dilapidated/primitive systems, lack of

knowledge and awareness of HRISs, human factors, lack of access to computers, and dependence on manual HR functions. The manual HR function in some hospitals is perhaps the reason for not having an effective technology based HRIS to monitor and manage their health workers. Managing the health workforce would require continuous report generation for strategic decisions and impact the sector positively.

The study further describes managerial, technological, and external dimensions as contributing factors to developing a pertinent framework for HRIS usage in managing workers in the public health sector of South Africa.

Some recommendations are flagged in this study, including guidelines for effective HRIS utilisation and future research directions.

Keywords: HRIS, Human Resource Information System, MTE framework, health sector, effective HRIS, HRIS utilisation, health workforce, healthcare sustainability, retention strategy, South Africa

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DEDICATION

This thesis is dedicated to the lord almighty Jesus Christ for giving me this great opportunity to fight towards achieving this great success. Also, to my greatest uncle that died recently, Sir Patrick Okwuchukwu Onyeaka (KSM) and my late parents Mrs Francisca Patego Udekwe and Mr Geoffrey Udenka Odogwu Udekwe (FCCA, FCA, MBA), for laying a solid foundation of sending me to school so that I could complete this journey of acquiring this qualification. I wish you were both alive to see me achieve this great objective in my life. Thank you to you both for giving me this opportunity in life. May their souls rest in peace and rise in glory in Jesus's name, Amen.

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GLOSSARY

Several key terms which have been used throughout the research study are clarified below:

Term	Definition/Description
Agency staff	Nurses and other medical workers who are employed on contract through an agent.
ATLAS-ti	A computer programme mainly used to analyse qualitative data. It is also known as CAQDAS (Smit, 2002).
Employee self-service	"A system whereby employees are given access to work on the company's system to capture their information by themselves" (Heikkilä, 2013:239).
Exit interviews	This is a form of interview conducted by managers with people who are resigning from an organisation to learn why they are leaving (Kumari, 2016).
Gang-ridden community	A community with a high rate of gang violence and killings in a country.
Government department	Government establishments such as the public health sector.
Health literacy	The ability of a person to access, understand and use information to make decisions and take action about health and healthcare at the organisational level (Martiniuk et al., 2019:1)
ID- viewer	A component in an operating system that lets administrators and users view the identification of individuals through a remote machine.
Intricate	"A complex process of performing certain functions that are very critical to organisations" (Troshani, Jerram & Hill, 2011:474).
Life Esdimeni	Life Esdimeni is a healthcare provider contracted to the South African Department of Health. A tragedy occurred in South Africa whereby some disabled people died when they were moved and housed in unregistered/undocumented homes (Dhai, 2018).
Locum	A term used when a medical doctor temporarily fulfils the duties of another doctor in the healthcare sector.
Management self-service	"The system where the managers are allowed to view, work on and sign information captured by their employees in the ESS functionality" (Heikkilä, 2013:239).
New curriculum	A new programme that warrants certain people to further their studies for skills improvement.

Term	Definition/Description
Occupational stress	A term used to describe "various types of both physiological and psychological burdens that are felt and handled by employees at the workplace" (Wushe & Shenje, 2019:2).
PERSAL	Personnel and Salaries Management System used by the national and provincial government (Mathews, 2017:124).
Re-assign system	A system that is used to move people around from one department to another in an organisation.
Support structure	A structure in place to assist workers in improving their services.
Timelessness of information	This refers to a situation where a piece of information cannot be captured on time and when required.

LIST OF ACRONYMS

List of abbreviations	
4IR	Fourth Industrial Revolution
AD	Asset Declaration
AIDS	Acquired Immune Deficiency Syndrome
ALT	Authentic Leadership Theory
ANC	African National Congress
AONL	American Organization for Nursing Leadership
ARO	Africa's Religious Organisations
ASCEND	Assuring Success with a Commitment to Enhance Nurse Diversity
BAS	Basic Accounting System
BCS	Basic Computer System
BPA	Business Process Automation
BPM	Business Process Management
CAQDAS	Computer-aided qualitative data analysis software
C/CDH	Clinics/Community Day Hospital
COMMSERV	Community Service
COVID-19	Coronavirus Infectious Disease 2019
CPUT	Cape Peninsula University of Technology
CT	Cape Town
DD	Deputy Director
DHS	District Health Sector
DOHSA	Department of Health, South Africa
DOS	Disk Operating System
D/PAH	District/Provincially Aided Hospital
DSS	Decision Support System
ECCR	Electronic Client Clinical Record
ECM	Electronic Content Management

	List of abbreviations
ED	Establishment Data
E-HEALTH	Electronic Health
E-HIS	Electronic Health Information System
E-HRM	Electronic Human Resource management
EMS	Emergency Medical Service
ERP	Enterprise Resource Planning
ESS	Employee Self Service
EU	European Union
FID	Faculty of Informatics and Design
GDP	Gross Domestic Product
GHWA	Global Health Workforce Alliance
G7	Group of Seven – a political forum consisting of Canada, France, Germany, Italy, Japan, the United Kingdom and United States.
HA	Home Affairs
HCD	Human Capital Development
HDC	Higher Degree Committee
HIC	High Income Countries
HIRS	Health Information Resource System
HIS	Health Information System
HIT	Health Information Technology
HIV	Human Immunodeficiency Virus
H/O	Head Office
HoD	Head of Department
HPCSA	Health Professions Council of South Africa
HR	Human Resources
HRD	Human Resources Department
HRH	Human Resources for Health
HRIS	Human Resource/s Information System
HRM	Human Resource/s Management

	List of abbreviations
HRMIS	Human Resources Management Information System
HRP	Human Resources Planning
HSS	Health Systems Strengthening
H&W	Health and Wellness
IaaS	Infrastructure as a Service
ICA	Ideal Clinic Assessment
ICT	Information and Communication Technology
ID	Identification
IS	Information System
IT	Information Technology
ITU	International Telecommunication Union
IVR	Interactive Voice Response
KM	Knowledge Management
KPP	Key Performance Plan
KR	Key Responsibility
LMIC	Low- and Medium-Income Country
LSR	Law of Statistical Regulation
MDS	Minimum Data Set
MIS	Management Information System
MSS	Management Self Service
MTE	Managerial Technological and External
NDHSA	National Department of Health, South Africa
NDP	National Development plan
NGO	Non-Governmental Organisation
NHA	National Health Act
NHD	National Health Department
NHI	National Health Insurance
NHP	National Health Plan

List of abbreviations	
NHRD	National Health Research Database
NHRPAC	National Human Research Protections Advisory Committee
NHS	National Health Sector
NSP	National Strategic Plans
NSSO	National Sample Survey Organisation
PA	Personal Assistant
PaaS	Platform as a Service
PDA	Prism Diversity Award
PE	Performance Evaluation
PERMIS	Performance Management Information System
PHC	Primary Healthcare
PHS	Public Health Sector
PR	Personal Record
PTI	Provincial Training Institute
SA	South Africa
SaaS	Software as a Service
SAMA	South African Medical Association
SAMP	South African Medical Practitioners
SANC	South African Nursing Council
SAP	System Application and Products
SARS	South African Revenue Service
SDG	Sustainable Development Goal
SEP	Specialised Education Programme
SOB	System Operating Booklet
SPMS	Staff Performance Management System
SPSS	Statistical Package for the Social Sciences
SPV	Single Patient Viewer
SR	Service Record

List of abbreviations	
SSEDP	Scarce Skills Employment Development Programme
TAM	Technology Acceptance Model
TB	Tuberculosis
TIES	Text Information Extraction System
TM	Talent Management
TOE	Technology, Organisational and Environmental
UAS	Universal Adult Suffrage
UCT	University of Cape Town
UHC	Universal health Coverage
UN	United Nations
USAID	United States Agency for International Development
UTAUT	Unified Theory of Acceptance and Use of Technology
WC	Western Cape
WCG	Western Cape Government
WCPDHW	Western Cape Provincial Department of Health & Wellness
WEF	World Economic Forum
WHO	World Health Organisation
WISN	Workload Indicators of Staffing Needs
WP	Western Province

RESEARCH OUTPUTS FROM THIS THESIS

A total of eight research outputs were derived from this thesis ranging from journal publications, book chapter, posters and research paper presented in conferences are categorised as follow:

Journal articles

1	Udekwe, E., Iwu, C.G., de la Harpe, A.C. & Daramola, J.O. (2021). Descriptive literature review of human resource information systems (HRIS) adoption issues in the health sector, South Africa. Research in Business & Social Science (IJRBS), 10(5): 261–275.
2	Udekwe, E., Iwu, C.G., de la Harpe, A.C. & Daramola, J.O. (2021). A systematic literature review of human resource information system (HRIS) usage in the health system of South Africa. International Journal of Research in Business & Social Science (IJRBS), 10(7): 87–115.
3	Udekwe, E., Iwu, C.G., de la Harpe, A.C. & Daramola, O. (2022). Factors affecting Human Resource Information System (HRIS) effectiveness in the South African public health sector. International Journal of Engineering, Management and Technology (IJEMT) Journal article. (Under review).
4	Udekwe, E. & Iwu, C.G. Impact of Human Resource Information System Performance to the Public Health Sector in South Africa Journal article. (Under review).

Book chapter

5	Udekwe, E., Iwu, C.G. & de la Harpe, A.C. (2022). Human resource information system as a strategic tool for public health sector sustainability. Governance as a Catalyst for Public Sector Sustainability Book chapter. (Under review).

Conference paper

6	Udekwe, E., Iwu, C.G., Daramola, O. & de la Harpe, A.C. (2022). Risk implications of ineffective use of human resource information systems in the South African public health sector. The International Conference on Information Systems and Emerging Technologies (ICISET), Windhoek, Namibia. (23-25 November 2022).

Conference posters

7	Udekwe, E., Iwu, C.G., de la Harpe, A.C. & Daramola, J.O. (2021) Effective utilisation of human resource information systems in the health sector of South Africa. Poster presented at the Cape Peninsula University of Technology (CPUT), Cape Town, South Africa, postgraduate conference on the (30 November 2021).
8	Udekwe, E., Iwu, C.G., de la Harpe, A.C. & Daramola, J.O. (2022) Effective utilisation of human resource information systems in the South African health sector. Won award for the **best poster presented** at NEMISA Summit and Colloquium, Cape Town, South Africa; Digital skills Summit on the (15-17 February 2022).

CHAPTER ONE: INTRODUCTION AND BACKGROUND

Chapter one – INTRODUCTION AND BACKGROUND
Overview of the study
Introduction
Rationale of the study
Background to the research problem
Statement of the research problem
Research questions, sub-research & objectives
Aim of study
Research design & methodology
Research approach
Data collection
Sampling
Data analysis
Ethics
Delineation
Significance of the study
Headline findings
Contributions
Conclusion
Chapter summary
Outline of the thesis

Figure 1.1: Layout of Chapter 1

As a strategic partner in organisations, the human resources department (HRD) is expected to support organisations with critical information regarding the workforce. Today's organisations achieve this through relevant information systems (IS). To be an effective and efficient HRD, human resources information systems (HRIS) should be seen to be supporting human resource management functions. Despite the availability of IS to support the HRD, the effective implementation and utilisation of such ISs in the HRD in sectors such as public health is still lacking. The lack of an effective Human Resource Information System (HRIS) utilisation process could deprive the public health sector of performance in managing their workers. However, HRIS utilisation appears to be out of position regarding the effectiveness of HRD in assisting the health sector in making strategic decisions to support skilled workforce sustainability and service delivery in the health sector (Wairimu & Ndeto, 2019).

1.1 OVERVIEW OF THE STUDY

This study begins by presenting the relevant issues of effective HRIS concerning strategic decisions within workforce management and retention in the public health sector. However, the premise is that HRD can perform strategic functions through HRIS. The study, therefore, explores the effectiveness of HRIS utilisation in the public health sector. Three steps define the logic of the study: Firstly, the need to determine factors that hinder the public health sector from effectively utilising HRIS; secondly, the impact of HRIS utilisation in monitoring and retention of skilled workers; and thirdly, the utilisation of HRIS to assist in improving service delivery in the public health sector. The study seeks to attend to these three issues through a grounded methodological approach. This brief overview introduces the study, and the section that follows provides details and critical issues on the introduction and background to the study.

1.2 INTRODUCTION

The effective use of HRISs can be an essential strategic exercise in any economy, and the need for such an IS could drive the delivery of reliable service (Zakumumpa et al., 2016). The utility of IS in managing HR lies in its capacity to reduce its complexity because, on its own, managing employees can be a daunting task (Valcik, Sabharwal & Benavides, 2021). The management of employees can be problematic due to the lack of effective use of HRIS to support the HRD; however, how such an IS can assist in managing and retaining a workforce (Pouransari, Al-Karaghouli & Dey, 2016).

The increasing use of technology in the workplace is something that society cannot ignore, especially on the issue of human resources management (HRM) and the fact that the world is shifting to a digital age where things need to be done digitally (Fairuzzabadi et al., 2021). Okwang (2020) is also of the opinion that HR activities in organisations cannot be overemphasized without the inclusion of technological advances in this 21st century. Barišić, Poór and Bach (2019) made it known that the HRD relies on ISs for their daily operations, including information capturing, analysis and report preparation, to provide accurate data for strategic decisions. However, such information could be less efficient when such systems are not effectively utilised.

There is a high need for effective HR practices through an IS in the health sector (Antony & Balu, 2018). The lack of adequate IS such as an HRIS can lead to vital information of employees being omitted or not correctly recorded for when the information is needed (Anupam & Sharma, 2017). Wright, Mahony and Cilliers (2017) also highlighted the use of manual processes to support the HRIS in most organisations which is detrimental to the system's effectiveness. Also, Makembo and Oluoch's (2018) study identified the use of outdated HRIS in the health sector, which brings about deficiencies in workforce management and the need for improvement in the use of HRIS is relevant.

HRIS access can assist in strengthening workforce sustainability and a relationship among the workers in the health sector, which is lacking in supporting the effectiveness of such a system (Rafferty et al., 2019). However, the deficiency in the strengthening of workforce sustainability can be attributed to infrastructural challenges; thus, there is a need for effective HRIS to strengthen the workforce and assist in the sustainability of the public health sector.

Several factors impede the effective use of HRIS in the public health sector, which according to Chopra and David (2016), include: i) lack of consistency, ii) lack of government support and iii) lack of standard IS. There is a need for effective HRIS in retaining skilled workers in the public health sector to measure the benefits of using the system.

Studies have highlighted that the health sector is recognised as one of the most valuable, fastest-growing and significant sectors for economic growth and social development in a country (Muthoka, 2016; Mayende & Musenze, 2018). As a result, governments need to take the health sector seriously as they continuously make decisions about the health status of their countries. For example, governments need to know how many medical professionals they have in the country, how many they need, who needs training and how many students are in the pipeline to become skilled medical professionals. This system can assist in making

informed decisions regarding the sector's sustainability, and decision-makers need quality information on the HR status of the health sector (Maruru, 2014; Kuyo, Muiruri & Njuguna, 2018). Tetteh (2014:42) describes the health sector as consisting "of all organisations, institutions and resources that are interacted and managed to improve healthcare services in a country". There is a need for an efficient health sector using the latest technology such as an HRIS for effective workforce education and management.

Essentially, knowledge and education on HRIS technologies are regarded as critical factors in the public health sector, and the need to create awareness for effective knowledge management in the sector is essential. Perhaps investments in the health sector workforce through putting practical IS in place are required, and HRIS is important to measure the efficiency of health sector workers (Manya, Sahay, Braa & Shisia, 2018). However, the use of HRIS is regarded as an essential contributor to the socio-economic development of a nation. The deployment of HRIS in the public health sector will help remove the traditional approach of managing information and health sector personnel. For this study, HRIS is defined as "a technology-based system used to acquire, store, manipulate, analyse, retrieve, and distribute relevant information regarding an organisation's HR" (Kavanagh, Gueutal & Tannenbaum, 1990:13).

Therefore, given the above, a need exists to have an effective HRIS within the health sector to monitor and manage the workforce. Related literature on HRIS has generalised the assumptions on the reasons that should be considered to determine the practical use. However, there is a dearth of empirical support for some of the propositions, models and assumptions on effective HRIS proposed in the literature (Bhuiyan, Rahman & Gani, 2015:172). Based on the works of Haladay, Sergio, Opulencia and Antiado (2015), the broad notion was that effective HRIS could be credible and of interest to the government, health sector authorities and the entire workforce for its strategic importance. Although Haladay et al. study was conducted through a descriptive and exploratory approach; it explained the realisation of a new approach to using HRIS for support, change management process and retention of workers in the health sector.

Drawing from the foregoing, this study aims to explore and understand the effective use of HRIS and factors that prevent such IS effectiveness in the public health sector of South Africa (SA). The objectives are: To determine the challenges faced by the public health sector using HRIS; to examine how HRIS could impact the performance of the public health sector; to identify different ways that HRIS can be used to monitor and manage the activities of the skilled health workforce; to establish how HRIS can contribute towards assisting the public health sector to retain skilled workforce; to explore how the government can support the use of

HRIS to improve service delivery and to determine how HRIS usage could benefit the public health sector for service delivery. Ultimately, this study will adopt a framework underpinned by the general system theory to propose a guideline for HRIS uptake.

The following three research questions are addressed in this study: a) What factors hinder the effective utilisation of HRIS in the public health sector? b) What impact does HRIS usage have in monitoring and retaining the skilled workforce? and c) How can HRIS be utilised to assist the public health sector in improving service delivery?

Keywords such as HRIS, Human Resource Information Systems, Effective HRIS, HRIS utilisation, workforce IS, and Health Workforce were used to retrieve relevant information from the electronic databases.

1.3   RATIONALE OF THE STUDY

Nurses account for 143,264 or 63% of the South African health sector. In comparison, medical doctors/specialists and researchers account for 19,988 or 9% of the total health personnel, yet 70% of the country's entire skilled health workforces are in the private sector. Even at that, 30% of doctors have migrated, and 58% intend to migrate to western countries (Ngobeni, Breitenbach & Aye, 2020:2). Managing these skilled health professionals without an effective IS in place can be challenging.

HRM in the health sector has contributed to improving the most crucial asset in the industry, that of employees, with a vision of attaining a competitive advantage (Malik, 2016). Armstrong (2014:5) defines HRM as "a strategic, integrated and coherent approach to the employment, development and well-being of the people working in organisations". To compete effectively, the health sector must improve its performance by reducing costs, differentiating, and enhancing the quality of services it renders. Such success cannot be achieved without efficient monitoring and management of workers, and the competitive strength of an organisation rotates around the sustainability of suitable HR (James, 2006; Maina, 2017; Anupa, 2021).

The management of people is a significant factor influencing the effectiveness of the public health sector. Unfortunately, in the last decade, less consideration has been placed on the effective management of HR in the South African health sector due to relentless difficulties in acknowledging HR as a critical function in the industry (Grobler, Wärnich & Mokobane, 2018). In fact, the history of the South African healthcare sector is linked to the transformation of the country's history (Padarath & Barron, 2017). SA is regarded as one of the most developed

countries in sub-Saharan Africa. However, studies have shown that SA ranks highest in the loss of skilled health workforce to high-income countries (HIC) due to poor labour and resource management (African Union, 2020). This reduction in the number of health workers in SA was also attributed to several factors such as lack of effective information technology (IT), lack of infrastructure, poor salaries and incentives, workload, load shedding, frustration at work, politics at work, lack of recognition and economic and inflation challenges (Venkatesh et al., 2003; Hlayisi, 2019).

The increase in the turnover rate of the workforce in the South African public health sector has created a massive vacuum that is difficult to fill (Shipalana, 2019). Chankova, Muchiri and Kombe's (2009) study based on the health workforce attrition rate mentioned that Africa is the most affected continent in the shortage of health workforce due to early retirement and resignation, deaths and poor technology. There is therefore a need to find a solution to curb the skilled health workforce attrition rate. Anabui et al. (2021) are also of the opinion that employees in the public health sector of SA expressed their dissatisfaction due to: i) lack of promotion, ii) poor working conditions, iii) staff shortages, and iv) below competitive salaries, all of which can result in a workforce exodus in the sector. The above accounts for some of the reasons why researchers such as Anabui et al. (2021) suggest further studies to identify appropriate staff retention policies, including IS, that should be in place for effective health sector management.

An effective HRIS can assist in keeping track of information concerning employees (Anupa, 2021). Numerous studies on the use of HRIS in healthcare exist. However, an overall lack of evaluative research raises questions about its capacity to improve its quality and efficiency (Tursunbayeva et al., 2017). Evaluative research would enable learning in healthcare systems and demonstrate how sociotechnical complexity influences the use and effectiveness of HRIS. Considering the views of Arachchige and Robertson (2015) and Ali, Sharhan and Alsaedi (2021), understanding how HRIS strengthens health sector effectiveness is instructive, especially in a developing country such as South Africa.

1.4   BACKGROUND TO THE RESEARCH PROBLEM

The national government of SA has invested significant funds in acquiring various ISs such as HRIS to have an effective HR system in the health sector. Yet, the sector still faces numerous challenges such as: i) disintegration, ii) lack of coordination, iii) the prevalence of manual systems, iv) poor interoperability with other information systems, and v) lack of workers' access (Orakzai, Ahmed & Hussain, 2017). A further challenge is the shortage of health

workforce in SA. The shortage of health workers has negatively impacted the public health sector, and the need to introduce an effective HRIS as a tool to use in the management of skill shortage is relevant (De Ponte, 2016; Asamani et al., 2020).

Furthermore, the health sector is regarded as one of the most critical sectors in any economy (Wright et al., 2017). However, in sub-Saharan African countries, the public health systems operate under enormous pressures ranging from dilapidated infrastructure, shortage of medicines, shortage of workers, long hours of work, and the lack of effective IS (Abebe & Chui, 2018). Effective monitoring of the workforce conditions requires the effective utilisation of HRIS to track the process of workforce management, retention, information accuracy and sustainability in the health sector. Unfortunately, these essential conditions are lacking in the public health sector (Kuyo et al., 2018; Jia et al., 2021).

Primarily, HRIS can improve healthcare reforms, leading to better quality, more efficient and accessible health systems to meet the UN Sustainable Development Goals (SDGs) (Marcelo, Medeiros, Ramesh, Roth, & Wyatt, 2018). However, an effective HRIS in the health sector will require successful implementation and good governance to coordinate the activities of the HRD, workforce management and sustainability in the sector (Lai, Taylor, Haigh & Thompson, 2018).

Several studies show that there is a demand for skilled experts in the public health sector, and the fact that there is a lack of IS such as HRIS to automate the HR functions is identified. The South African public health HR system is still more manually than electronically operated (Malindadi, 2016). However, this intervention used to support HRIS has a negative impact on the system's effectiveness, and the need to conduct studies to improve the system to the latest technology is necessary. An HRIS is expected to have the HR functions on a technological platform for effective performance in the sector. However, Alzhrani (2020) indicated that the public health sector is still lacking in using such technological platforms for HR functions. There is a need for an HRIS platform to manage and identify workers when they are needed through the system.

According to Gandolfi (2015), challenges facing the health sector, such as lack of knowledge of HRIS and its effect on workers' sustenance in the sector, are reason enough to motivate further studies to be conducted in this field. Wall and Vienings (2017) also noted that the public health sector has failed to understand that effective HRIS can positively impact the management of skilled workers and contribute to service delivery if it is prioritised. The fact is that the health authorities do not consider the importance of skilled workers and the need to

nurture them through supporting technological structures in place. Also, the need to realise the importance of skilled workers as critical in the health sector is significant.

The challenges mentioned above underline the reasons for the lack of effective HRIS in the public health sector. Also, the lack of a technological platform with HR functions for better HR management processes in the sector is connected to the problem of not measuring the benefits of using HRIS in the public health sector (Thayer et al., 2021).

1.5   STATEMENT OF THE RESEARCH PROBLEM

There is a notion that the SA public health sector does not effectively use HRIS to monitor and manage the workforce. Furthermore, the industry is faced with the challenges of trying to find a way to adapt to the new and improved ways of using an HRIS for workforce management and sustainability in the health sector. But due to the lack of upgrades, lack of knowledge, resistance to change, and infrastructural and technological challenges, the effective utilisation of HRIS is not attainable (Deharja et al., 2020).

Anupa (2021) mentioned that HRIS is regarded as a software solution for workers' data entry, tracking and storage of information that can assist the management to make trusted decisions and at the moment, such performance is still lacking. The lack of effective HRISs in health makes it challenging to manage and monitor workers, negatively affecting the country's public health service delivery. Haule and Muhanga (2021) also highlighted that ICT was found to have a significant influence on cost reduction and health service delivery and that HRIS remains an important IS. Still, due to the non-effective use of the system, effective and efficient health services cannot be provided in public hospitals.

Furthermore, the lack of effective HRIS translates into workplace stressors and adverse outcomes for the health workforce management (Wushe & Shenje, 2019). Also, HR processes are not available that are effective enough for early detection of malfeasance using HRIS (in this case disturbing conditions for health practitioners) and timely amelioration of debilitating conditions (Forgia et al., 2015). This means that in the long-term, the consequence of ineffective use of HRIS can be debilitating and damaging to workers' health, well-being, and ability to engage with technology for optimal performance of their duties. Therefore, there is a need for the longer-term impact of ICT in HRIS to be prioritised for future benefits (Abdul Rahman, 2020; Kalyani, 2021). Notwithstanding these benefits, HRIS has not been effectively implemented and utilised, together with no proper monitoring and control measures in the health sector, resulting in a drastically reduced health workforce (Were et al., 2019). Mabaso

(2020) however indicated that South African government departments deploy HRIS to automate HR service delivery and administrative functions, but found a lack of consistency in its usage. Another difficulty that emerges is interrelating with other ISs in different departments to improve the management of the country's workers. Furthermore, despite the considerable investment of resources towards the elevation of SA's public health system through the improvement in education and other resources, they are still faced with the lack of HRIS usage for management of scarce skills and also the improvement in health outcomes to compete with other middle and high-income countries (HIC) (Hompashe, 2021).

Katuu (2018) argued that several challenges that impede the effective utilisation of HRIS need to be further researched using empirically developed frameworks, theories and models for a comprehensive analysis of the health sector HRIS in SA. Even though the benefit of using an HRIS in the health sector has been considered in the research world, there has not been a conclusive study on how HRIS can be effectively utilised for workforce retention and sustainability in the public health sector (Gautam, 2017; Adams, Ryan, & Wood, 2021). Tursunbayeva, Pagliari, Bunduchi and Franco (2015) express a need to conduct a study on HRIS in the health sector to determine its impact on the management of the workforce within the health sector. They also highlight that little research on the use of HRIS to support HR functions within the health sector has been done to date.

Alam, Masum, Beh and Hong (2016) suggested the need for more studies to explore other factors that inhibit effective utilisation of HRIS and their impact on the health sector. Unfortunately, very little is known about the effective utilisation of HRIS in the public health sector of SA.

Problem statement
HRIS has not been effectively utilised within the public health sector owing to inadequate monitoring and management measures for sustainability and retention strategies, including keeping accurate information about the skilled health workforce

1.6 RESEARCH QUESTIONS, SUB-RESEARCH QUESTIONS AND OBJECTIVES

This study's locale is the Western Province of South Africa. Table 1.1 below presents the main research questions (RQ) and sub-research questions (SRQ) and aligns them with the research objectives (OBJ).

Table 1.1: Research questions, sub-research questions and objectives

RQ1: What factors hinder the effective utilisation of HRIS within the health sector of South Africa?	
SRQ1.1: What are the reasons for the ineffective utilisation of HRIS in the health sector?	**OBJ1.1:** To determine the reasons for ineffective use of HRIS in the healthcare sector.
SRQ1.2: How does HRIS impact the performance of the health sector?	**OBJ1.2:** To examine how HRIS could impact the performance of the health sector.
RQ2: What impact does HRIS usage have on monitoring and retaining the skilled workforce in the health sector?	
SRQ2.1: How can HRIS be used to manage health sector workers?	**OBJ2.1:** To identify different ways that HRIS can be used to monitor and manage the activities of the health workforce.
SRQ2.2: How does HRIS assist the health sector in encouraging skilled workforce retention?	**OBJ2.2:** To establish how HRIS can contribute towards assisting the health sector to retain the skilled workforce.
RQ3: How can HRIS be utilised to assist the health sector in improving its services to the public?	
SRQ3.1: How can the government support the use of HRIS to improve service delivery in the health sector?	**OBJ3.1:** To explore how the government can support the use of HRIS towards improving service delivery in the health sector.
SRQ3.2: What benefits could accrue in the effective use of HRIS in the health sector?	**OBJ3.2:** To determine the benefits that could accrue in the use of HRIS in the health sector.

The study was conducted using multiple case and survey strategies, a literature review, questionnaire distribution and semi-structured interviews.

1.7   AIM OF STUDY

The epileptic service delivery in the public health sector of South Africa (Nchuchuwe & Etim, 2020), despite the adoption and utilisation of HRIS is rather problematic and warrants investigation into where the problem lies – whether material or human. Therefore, the aim of this study was to explore and understand how HRIS can be effectively utilised within the SA public health sector. Adopting a three-part focus, the study determined factors that deter the public health sector from effectively utilising HRIS; secondly, the study evaluated the impact of HRIS utilisation in monitoring and retaining skilled health workers; and thirdly, the utilisation of HRIS to assist in improving service delivery in the public health sector.

1.8 RESEARCH DESIGN AND METHODOLOGY

A brief description of the research design, methodology and ethics follows under the following headings: i) research design, ii) philosophy, iii) approach, iv) strategy, and v) data collection.

1.8.1 Research design

A research design is "the blueprint or plan which stipulates how data and information relating to a particular phenomenon will be collected and analysed" (Zikmund, Babin, Carr & Griffin, 2010; Kagehi, 2015). Due to the nature of the study, a descriptive and exploratory research design was used to explore the effective utilisation of HRISs in the public health sector of SA (Saunders, Lewis & Thornhill, 2019). For a research design to be accurately executed, the research method must be systematically and methodologically implemented for purposes of accuracy (Babbie & Mouton, 2001). Partially integrated multiple methods were used, with the qualitative methods playing a leading role and the quantitative methods playing a supporting role. This is because the collected quantitative data was not enough to generalise the data; thus, interviews were conducted to understand the participants' thoughts.

Dennis and Valacacich (2001) note that a study is conducted to either create new ideas to existing knowledge or introduce a new scientific understanding of a phenomenon. However, research methods, according to Terre Blanche, Durrheim and Painter (2009), can be categorised into three major methods, namely qualitative, quantitative and mixed methods; which method is used in a study will be dependent on the research approach and expected results of the investigation. As mentioned above, this study combined both qualitative and quantitative methods, and partially integrated multiple methods were used to acquire a comprehensive view of the effect of using an HRIS in the public health sector and how the participants' thoughts impacted the study outcome (Saunders, Lewis & Thornhill, 2009). This combined method will also be used to make up for the deficiencies of both qualitative and quantitative methods of data collection.

1.8.2 Research philosophy

Research philosophy is a term used for a system of assumptions about the development of knowledge and the nature of that knowledge concerning a study (Saunders et al., 2019). Rendtorff (2013:1415) is of the view that a researcher need to be "conscious of the philosophical foundation of the research problem, have an idea of the nature of the problem, then identify methods to use and also have a knowledge of the logical approach to follow in answering the research problem." A research philosophy deals with the nature of knowledge

that relates to i) ontology, ii) epistemology and iii) methodology of a study. The different research philosophies that were used in this study are presented below:

1.8.2.1 Ontology

Ontology is defined according to Greener (2011:4) as "the theory of being, in other words, it refers to a situation where humans need to find out what exists and what is expected to exist in a real-life context". Saunders et al. (2019:134) emphasize that ontology "is reflected as a nature of certainty based on either subjectivism or objectivism, but such decisions will depend on the research approach used to conduct the study". Saunders et al. (2019) further explain that objectivism embraces realism. Realism indicates that social reality is created from an existing natural phenomenon (natural world). In contrast, subjectivism implies that social reality is created from social actors' perceptions and consequent actions (Saunders et al., 2019). This aligns with Allison and Pomeroy's (2000) opinion that subjectivism reflects a social occurrence created from the ideas of those actors concerned with their existence in a real-life context. This study is objective and subjective as it refers to the effectiveness of HRIS in a mixed method design; therefore, the ontological philosophy is objectivism and subjectivism.

1.8.2.2 Epistemology

Epistemology is defined according to Greener (2011:4) as "the theory between actual knowledge and what is regarded as good knowledge". In order words, research is conducted to differentiate between the knowledge of what we encounter in a real-life situation and what we intend to know to improve in what we do know. Du Plooy-Cilliera, Davis and Benzuiedenhout (2014) support Greener (2011) that epistemology is the way individuals create knowledge about social events without considering what happens in real life. Greener (2011) suggests that epistemology can align with either positivism, interpretivism, critical realism, postmodernism or pragmatism. The epistemological approach adopted in this study is pragmatism. Pragmatism allows a researcher to use a qualitative method combined with some quantitative data for analysis in a study (Saunders et al., 2019:145). This study adopts the ontological approach of objectivism and subjectivism, which aligns well with the epistemological paradigm of pragmatism (Saunders et al., 2009). Epistemological pragmatism was followed to identify what is needed to improve the workforce structures in the public health sector of SA using HRIS and to have a new understanding of the topic through proposed guidelines and framework.

1.9   RESEARCH APPROACH

The research approach is known as the plan of action that gives direction to the researcher on how to carry out a study effectively and systematically (Morse & McEvoy, 2014). However, there are different research approaches used to conduct a study which Bryman and Bell (2007) identified as deductive, inductive and abductive. Saunders et al. (2019:153) explain the three approaches: i) the deductive approach is where a theory is often developed from the reading of academic literature and is usually applied in a quantitative study, ii) the inductive approach deals with the collection of data to explore a phenomenon, from which a new theory is developed, and is mainly applied in a qualitative study, and iii) the abductive approach deals with the collection of data to explore a phenomenon, then themes, keywords and patterns are identified to modify existing theory or generate a new theory. This is usually applied in a mixed method study. However, any approach used in a study will be determined by the research methodology applied in the study. This study was conducted using partially integrated mixed methods embedding elements of subjectivism and interpretivism. Therefore, an abductive research approach was followed (Singleton & Straits, 2005; Al Haziazi, Al Hajri, Subramanian & Muthuraman, 2021).

This study proposes a guideline as well as a framework as a guide towards an effective HRIS in the health sector of SA. The findings lead to the reasons, explanations, and understanding of why HRISs are not effectively utilised, and why the benefits in terms of workforce retention and sustainability cannot be easily realised in the public health sector. As the study contributes towards theory improvement through a proposed framework, the data collection and analysis fluctuate between these actions, leading to the use of the abductive research approach that was followed (Gold, Walton & Anderson, 2011; Gebre-Mariam, 2018).

1.9.1   Research strategy

A research strategy is an overall plan for conducting a research study. In other words, it assists the researcher in planning, monitoring, and executing the research and enhances the research method that deals with data collection and analysis (Saunders et al., 2019). Further, a research strategy is a general plan of how the researcher will follow through with the research towards answering the research questions. This study will use multiple case studies and survey research strategies with the involvement of four selected public hospitals in SA.

According to Yin (2003:12), a case study is defined as "an empirical inquiry or situation in a real-life context which can be used when boundaries between a phenomenon and context are not identified". However, multiple case studies can present identical results or envisage

conflicting results (Yin, 2003). This study explored similar cases (4 hospitals) to understand the phenomenon better.

1.9.1.1 *Unit of analysis*

Babbie (2010) describes the units of analysis as the selected organisations/facilities/establishments where a particular study is conducted. In this study, the researcher applied for permission to conduct the study in about ten public hospitals through the Western Cape Provincial Department of Health and Wellness (WCPDHW) of SA, but due to contingencies such as the COVID-19 pandemic and other unforeseen reasons, only four public hospitals were approved in the province to participate in the study (see Chapter 5, Table 5.3).

1.9.1.2 *Unit of observation*

Boell and Cecez-Kecmanovic (2014) describe units of observation as the individuals/participants in a study. The units of observation in this study are the people who participated from different departments/sections of the four selected public hospitals for the study in the WC of SA. 41 people were interviewed, and 46 people completed the questionnaires in the four selected hospitals, which is a total of eight-seven (87) purposively selected individuals who participated in this study. The purposively selected participants are in the human resources, information technology, clinical sections and other departments/sections working in the chosen units of analysis (hospitals), and are itemised in Chapter 5, Table 5.4.

Choosing this set of participants is consistent with the sampling choices of Iwu, Allen-Ile and Ukpere (2012), Kovane (2015) and Barbazza, Langins, Kluge and Tello (2015). Their participants covered the spectrum of IS administration in the medical workforce administration, including HR, IT and clinical staff members. It is noteworthy that HRIS could facilitate the early detection of grievances, discomforts, and resignations that healthcare employees present.

1.10 DATA COLLECTION

Babbie and Mouton (2001), and Saunders et al. (2009) identified diverse forms of data collection such as interviews, questionnaires, observations, secondary data, experiments, and sampling methods. Interestingly, Terre Blanche et al. (2009) mentioned that the reason for collecting data is to capture sensible and quality information that can be interpreted into

credible answers to research questions. Kiros (2018) supported the former by emphasizing that a mixed-method study requires interviews and questionnaires to determine answers to questions under study.

The researcher collected data using questionnaires and a semi-structured interview guide for this study. The questionnaires were in multiple-type 5-point Likert scale format, with anchors ranging from "strongly disagree to strongly agree" used in the construction measures, where the participants had to tick the appropriate answers in a box (Barua, 2013; Alkhowaiter, Dwivedi & Williams, 2013; Bwonya, Ogutu & Okeyo, 2018). The semi-structured interview schedule was used in the form of open-ended questions to collect the qualitative data; a voice recorder was used, and notes were taken to prevent the loss of pertinent information in the stages of the study (Qu & Dumay, 2011).

1.11   SAMPLING

A sampling frame is a list of all the entities in a population from which a sample is taken (Rubin & Babbie, 2014). In other words, it is the total number of units from which data is collected. It is also referred to as the aggregate or totality of all the subjects that conform to a set of specifications from which a sample is selected (Maree, 2007). However, Sandelowski (2000) indicates that a sample strategy is used to streamline the volume of data collected for a study due to contingencies such as time, costs, access constraints, and the high volume of information generated from the participants. According to Waight (2013), there are two types of sampling techniques, known as probability and non-probability sampling:

- **The probability** sampling technique is based on random contemplation, indicating that anybody has the chance of being selected to participate in a study irrespective of who they are. Such a method is usually conducted through a quantitative process (Saunders & Rojon, 2014). Participants in probability sampling are selected through different avenues such as stratified, simple random and systematic sampling methods (Hirano & Roberson, 2017).

- **Non-probability** sampling technique is based on non-random contemplation such as availability and conformation within the population and many other norms (Morse & Cheek, 2014). Non-probability sampling is based on the subjective standards of the researcher concerning the kind of information that is expected from the participants. It also regards the non-probability sampling method used to select the participants such as snowball, quota, convenience and purposive sampling (Flick, 2010; Okwang, 2020).

Naderifar, Goli and Ghaljaie (2016) emphasize that it is essential to select a distinctive sample of the target population to make a suitable and precise conclusion that will be referenced back to the selected population. This is due to bias and inadequate sampling procedures, which are

commonly the reasons for flawed and imperfect study conclusions. Also, the sampled population must be adequate to make up useable information. In summary, the sampling technique for this study is non-probability sampling using purposively selected participants from the four selected public hospitals in the WCP of SA. A sample frame was drawn from each of the hospitals, and a 10% assurance recess was maintained in the data collection process. A sample frame was drawn from each of the selected four hospitals. Forty-one interviews were conducted, and forty-six questionnaires were completed, which is a total of eighty-seven data sets collected from purposively selected participants to guarantee the correctness and authenticity of the study.

1.12 DATA ANALYSIS

Coleman, Guo and Dabbs (2007) and Greener (2011) described data analysis as compiling all the data collected for a study, analysing, and transforming the data into valuable information to produce sensitive and useful information. Qualitative data was collected using semi-structured interviews, which were conducted and the data was transcribed and coded (Broom, 2005). The transcribed data were analysed using ATLAS.ti (Kelle, 1995; Assegaai, 2021).

The quantitative data was collected using closed-ended Likert scale questionnaires. The data was captured and cleaned in the Microsoft Excel Spreadsheet, then captured in the Statistical Package for the Social Sciences (SPSS) datasheet to draw up the results in tables and charts (Burns & Burns, 2008). A descriptive statistical analysis was employed in the quantitatively analysed data to support the response from the qualitative data (Sumathi, 2017).

1.13 ETHICS

Babbie (2010) affirms that ethical research is the binding agreement between participants in an investigation, the organisation participating in the study, and the researcher regarding the proper and good conduct of the study. Ethical research practice necessitates that the researcher observes specific rules, including consent and permission, obtained before data collection. This is to facilitate the contract between the researcher, the selected hospitals and the purposively selected individuals participating in the study.

During the study, the researcher ensured that: i) no harm comes to the participants, ii) that the participants' confidence and identity were not betrayed, iii) their participation was voluntary, iv) the participants were all treated as anonymous, v) the study did not interfere with the normal working conditions of the participants and the hospitals and vi) the study was conducted with

honesty and truthfulness whereby the participants were informed what the research was meant for and what the expected outcomes were going to be (Greener, 2011; Roberts, 2021). Permission to conduct the study was received from the various hospitals and the participants themselves. Also, ethics clearance was received from the CPUT Research Ethics Committee. However, the relevant consent will be discussed in detail in Chapter 5 below.

1.14 DELINEATION

This study was limited to four selected public hospitals in the WCPDHW of SA. This study was delineated in terms of HRIS in the health sector and only covered the workforce in hospitals that provide health services in the WCP of SA. Also, the study only extended to purposively select 87 staff members of the selected public hospitals in WCP of SA. No other hospitals, health facilities, organisations or companies were involved in this study.

1.15 SIGNIFICANCE OF THE STUDY

There are limited numbers of theoretical research investigations on the implementation, use and effectiveness of HRIS within a complex healthcare setting, such as the public health sector (Dilu, Gebreslassie & Kebede, 2017; Lema, 2018). According to Møller and Skov (2021), a study's significance is the contributions made through theory and practices. This study contributes to the body of knowledge, especially in the HRIS field and the public health sector in general. The theoretical framework derived from this study aims to reveal significant benefits accruable from the effective use of HRIS. Exploring the challenges of HRIS technology usage, the study developed a set of guidelines for the effectiveness of HRIS technology to assist the public health sector in understanding the need for and importance of making decisions relating to HRIS technology improvement to support the health system.

The proposed guideline is a practical contribution to the public health sector and presents a process of getting acquainted with the reasons, challenges, impact, management, performance, and contribution of HRIS technology in the healthcare environment. The effectiveness of the change management process through the evaluation of effective HRIS needs to be technologically improved with attributes such as complexity, compatibility, suitability, accuracy, security, ease of use, accessibility, capability, and transparency. These attributes can assist in adopting an effective HRIS for potential benefits in the public health sector. These procedures can further assist the health sectors in understanding the effectiveness of a new and improved HRIS technology as it relates to the needs of the health service with regards to the possibility of adopting, interrelating, upgrading, and managing the

skilled health workforce and the sector in general. This can be attained in retention, sustainability, service delivery and competitive advantage in the public health sector.

1.16   HEADLINE FINDINGS

The headline findings that emerged as keywords in the study are: i) primitive/outdated system, ii) manual intervention, iii) basic administration of information, iv) access to computer and information systems, v) availability of sufficient funds/budgets, vi) the timelessness of information, vii) substructural challenges, viii) the confidentiality of information, and ix) resistance to change. These key findings suggest that the current unchanging context of HRIS usage in the South African public health sector is significant, resulting in pessimistic feelings among the workers and the sector in general. These findings are discussed in chapter seven of the thesis.

1.17   CONTRIBUTIONS

There are three categories of contribution: i) theoretical, ii) methodological, and iii) practical contributions, which are itemised:

1.17.1 Theoretical contribution

A theory is regarded as a set of ideas used to explain social behaviour in organisations (Wilkins, Neri & Lean, 2019). It is also a framework or model of reality (Cloutier & Langley, 2020). Remenyi, Williams, Money and Swartz (2002) observe that in an academic research atmosphere, there are two significant aspects of measuring and assessing the contributions that can be derived from an academic research perspective, namely contribution in benefits and contribution in usage. Remenyi et al. (2002) further explain that: i) contribution in benefits refers to the personal benefits that a researcher gains from a study, while ii) contribution in usage refers to the scholarly and academic contribution that a study will bring into the academic, business and technological sphere. The contribution in terms of academic usage through theoretical framework will assist the students, academicians, businesses and other sectors in obtaining useful thoughts and ideas that will help them improve their performance.

However, Wilkins et al. (2019) believe that developing an ideal theoretical framework will require an investigation to identify solutions to a real-life problem rather than focusing more on identified gaps in the literature. The theoretical contribution of this study will be a body of knowledge in terms of contribution to the usage of technology to explore an effective HRIS that

is upgraded with all the functionalities of the latest technology to eliminate manual HR functions in the public health sector. The study further explores a sophisticated HRIS with government and management participation to embrace the contribution to an intricate healthcare environment.

1.17.2 Methodological contribution

A partially integrated multiple method research design was followed to justify the identified methodological gap in this study. The data collected was validated for relevancy in the study from the participants in the selected 4 hospitals from the (HR, IT and Clinical/skilled health) workers. A total of 87 purposively selected people participated in the study, which is a combination of 41 interviews and 46 questionnaires to find out the level of their interactions with HRIS and how such interactions impact their work performance. The combination of these two data collection methods offered an opportunity for the researcher to capture the experiences of the participants' comments concerning the effective use of HRIS in the public health sector.

1.17.3 Practical contribution

This study contributes to the existing body of knowledge by providing a guideline and a framework for practical application in solving real-life problems of HRIS usage to benefit public health organisations and their skilled workers. The study explores the complexities and lack of upgrades of HRIS used in the public health sector. It also develops an understanding of the artefacts that lead to effective HRIS utilisation and the identification of the transformation of HR functions from a manual process to fully integrated HRIS with the latest technology that allows workers access to HRIS. Furthermore, the study proposes a framework to support the effectiveness of HRIS usage within the public health sector of SA.

1.18   CONCLUSION

In Chapter One, the researcher introduced the HRIS in the public health environment in which the study was conducted through the background to the research problem. The lack of effective HRIS in the health sector and service delivery lies in the fact that the HR functionalities are manually supported, while a fully electronic system is required to improve HR-related tasks. Moreover, the lack of upgrades with suitable and appropriate HRIS

applications are some of the challenges faced, with implications for workforce sustainability, retention, and service delivery.

Due to the nature of the work that the skilled health workforce does, effective HRIS could be argued as critical and necessary to allow access through a platform to submit HR information rather than distracting the relevant staff with manual operations. The findings of this study show that the effective use of HRIS technology could assist the public health sector in monitoring and managing the workforce for effective and efficient health service provision in the country.

To this effect, the study aims to explore and understand the use of HRIS and factors that prevent the effective use of such IS in the public health sector of SA. An exploratory and descriptive study was followed to gain a deeper understanding of the previously identified obstacles and other reasons that affect the effectiveness of HRIS in the public health sector. An abductive approach was adopted to address the research findings. The result is further aimed at proposing a guideline as well as a framework to guide towards effective utilisation of HRIS in the public health sector for skilled workforce management, retention, and sustainability in a complex healthcare environment.

1.19   CHAPTER SUMMARY

The health sector is acknowledged as a significant contributor to the development of any nation. As a result, this study aimed to determine why HRISs are not effectively utilised in the public health sector despite their acknowledged importance. Factors responsible for high attrition levels in healthcare professions such as nursing, community health service, medicine and emergency medical services can be identified on time and possibly managed. In this regard, therefore, this study is relevant. A mixed method approach was used, which targeted critical members in the sector. The findings will assist in facilitating a better understanding of the necessity for and ways to utilise HRIS to advance the public health sector effectively.

1.20   OUTLINE OF THE THESIS

Chapter One of this study deals with the introduction, rationale, background to the research problem, statement of the research problem, research questions, sub-research questions, objectives, research design and methodology, data collection, sampling, delineation, significance, contribution, summary, and outline of the study.

Chapter Two covers the literature review. The significant topics reviewed in this chapter include HRM, E-HRM, HRMIS and HRIS. The researcher reviewed the literature on E-HRM and HRIS technology from different sources such as textbooks, current and past articles, the internet, lecture notes, newspapers, and thesis from other tertiary institutions worldwide. In this chapter, the researcher identified different types of HRIS software, the importance of HRIS, functions, advantages, limitations, benefits, and functionalities. This chapter was also used to introduce HRIS and its relation to HRD in an organisation. Also, the challenges faced in using HRIS were identified as infrastructural, organisational and skills were explained in detail and how such challenges impact the use of HRIS.

Chapter Three is a continuation of Chapter Two. The researcher reviewed the state of the health sector in SA through the review of past literature on the background of SA's health sector, health strategy, brain drain and migration, recruitment and retention in health, staff turnover, healthcare utilisation, health workforce development, UHC, and NHI initiatives. These topics served as an insight into the past and present situation of healthcare delivery in SA. In this chapter, the researcher identified some challenges faced by the public health sector in SA, such as inequality, disintegration, favouritism, and occupational stress, which were part of the reasons that bring about resignation in the health sector. Other reasons for the reduction in the number of the health workforce in SA include low prospects for promotion, management and financial problems, lack of self-esteem, lack of self-actualisation, salary issues, lack of effective training and career development opportunities due to the lack of resources to implement training skills to empower the workers. Also, the massive reduction in the number of health workforce has impacted the country's health system service delivery. The WHO's workforce impetus for 2030 is to invest in the expansion, transformation and regulation of the global health workforce in Africa through the adoption of proposals that consist of: i) secure commitments, ii) adaptive inter-sectoral engagement, iii) development of effective action plans, iv) stimulating accountability, v) commitment and advocacy, vi) improvement on health labour market data, analysis and tracking of data in all countries' health, vii) accelerating investment in transformative education, skills and job creation and lastly, viii) establishing an international platform for health worker mobility (WHO, 2017a). These recommended proposals are yet to be accomplished, which calls for the effectiveness of IS such as HRIS for growth and efficient health workforce regulations in Africa.

In **Chapter Four,** the researcher reviewed past and present literature on the effectiveness of HRIS concerning the health workforce in SA, HR and IS, HRH in Africa, HIT in health, cybersecurity in IT, HIS, DHS transformation, HRIS in the health sector and adopted theoretical frameworks in HRIS. If effectively utilised, HRIS can be useful in HRD and the entire health sector for recruitment and selection, updating and maintenance of employee

data, generating HR reports, employees' deductions, direct deposit distributions, career planning, self-service technology, training, and development. However, such effectiveness is faced with challenges which include the unsteady financial capacity to acquire HRIS, lack of updates and maintenance of HRIS, inadequate ICT and HRIS proficiency among the HR workforce, inadequate coordination of government mechanisms in the performance of their legal tasks, instability of internet connectivity and inadequate top management support (Dilu et al., 2017:2). These challenges are part of the major reasons for the lack of effective HRIS in the public health sector of SA, which also impacts health workforce reliance and sustainability.

In **Chapter Five**, the researcher discussed the research design and methodology, including research design, process, philosophy, approach, strategy, data collection, data analysis, ethics, and limitation of the study. A mixed method approach was relevant to this study, using both qualitative and quantitative methods. This enabled the researcher to interpret and analyse the data collected. The population sampled was reasonable enough for the data analysis even though the study was conducted during the peak of the COVID-19 pandemic. Different stages of data collection, data capture, data presentation and data analysis were also explained in this chapter. The researcher analysed the data collected to define the problem, background, aims, and objectives of the study. However, two research designs were used, descriptive and exploratory research, to enable the researcher to analyse the data collected. The data was collected using an open-ended semi-structured interview schedule and a close-ended 5-point Likert scale questionnaire. Data were collected from 4 selected public hospitals in the WC of SA, out of which 41 participants were interviewed and 46 participants completed the questionnaires. The research instruments used to analyse the data collected were ATLAS.ti for qualitative and SPSS for quantitative methods. Hence, the analyses were drawn from the interviews conducted, and the statistical results were used to support the qualitative analysis.

Chapter Six of this study is about data analysis. Data was collected through interviews and questionnaires. ATLAS.ti and SPSS technologies were used to analyse the mixed data using tables, bar charts, pie charts, code frequencies, and graphs to illustrate the responses from the participants. Data collected was also analysed by outlining the opinions of the purposively selected participants in the four selected public hospitals in the Western Cape Province, and their experiences in effectively utilising HRIS in their workplaces. The data were processed and analysed to enable the researcher to ascertain answers from both the interviews and questionnaires related to the research questions and sub-research questions. The questions from both the qualitative and quantitative methods were categorised into two sections: demographics and questions relating to the study. The first section consisted of questions relating to gender, age, qualifications, department, position, and year of service. The second

section, the qualitative side, consists of open-ended questions (1-Yes, 2-No, and 3-No idea) supported by comments in response to the research questions through audio-recorded interview sections. The quantitative side consists of closed-ended Likert scale questions (1-Strongly disagree, 2-disagree. 3-Neither agree/disagree, 4-Agree, and 5-Strongly agree). The researcher merged "strongly agree and agree" and "strongly disagree and disagree" in the investigation to consolidate the responses to facilitate the analysis (Caracelli & Greene, 1993). Tables, charts, and graphs were used to demonstrate the results from the data collected from both the interviews and questionnaires. The comparative analysis was discussed in this chapter, which revealed that the South African public health sector does not effectively use HRIS for workforce management, according to the results from the data represented in the study. The results highlight issues such as the primitive system, manual intervention, and use for only basic administration, lack of sufficient funds, infrastructural challenges, centralised system, and lack of sophistication, the timelessness of information captured, substructural challenges, and lack of confidentiality of healthcare information. Furthermore, the skilled workers' lack of computers and access to HRIS due to a lack of knowledge and awareness of technology in the SA public health sector creates discouragement and deficiency in the utilisation of HRIS. These findings should encourage the SA public health system to improve the effectiveness of its HRIS.

Chapter Seven of this study is the discussion of the findings. It took the form of descriptive and exploratory methods of research. The discussion was done by adopting different headings from the most identified words from the interview (keywords), and the sub-research questions to discuss the findings. The use of data analysis tools such as ATLAS.ti and SPSS was discussed in the previous chapters. The results were used in Chapter Seven to prove the reliability of the data. HRIS as an application is regarded as an IS that can assist organisations in networking and workforce support in their performance of HR functions. The activities can be done by using HRIS functionalities such as payroll, recruitment and selection, training and development, performance appraisal, time and attendance, absence management, scheduling, and analytics, amongst others. The indication is that the South African public health system uses HRIS (PERSAL), but the system is not sophisticated which is an indication that most HR functions are manually conducted. This situation creates the need to propose a guideline for proper and effective utilisation of HRIS for workforce management in the public health sector of SA. This guideline proposes a better working environment and performance of the health workforce using HRIS for better results regarding workforce management strategy implementation. This study further suggests a need for HRIS access.

Chapter Eight provides a conclusion and recommendation to the study. A framework was introduced as a guide to assist the public health sector in effectively utilising HRIS technology.

The study's limitations and the study's thoughts are highlighted in this chapter. This chapter provided answers to the research questions, problem statement, aims and objectives of the study. The study addressed the issues of effective use of HRIS technology in the public health sector, with a guideline in the form of a framework drawn from the knowledge gained in the study to address the identified problem associated with health workforce sustainability. Recommendations are provided as a guideline towards the adoption process of HRIS to improve the public health system in the future.

In the next chapter, a literature review covers the background of E-HRM and HRIS in organisations.

CHAPTER TWO: THE BACKGROUND OF E-HRM AND HRIS

Chapter two – THE BACKGROUND OF E-HRM AND HRIS
Introduction
Human resource management (HRM)
Human resource management information systems (HRMIS)
Human resource information systems (HRIS)
The use of HRIS for competitiveness
Obstacles to effective HRIS implementation
Challenges faced by HRIS usage in organisations
HRIS usage and organisational performance
HRIS usage as an investment
Limitations of HRIS
Chapter summary

Figure 2.1: Layout of Chapter 2

2.1   INTRODUCTION

EHRM and HRIS have become an essential part of managing the healthcare ecosystem. The control of healthcare is a complex and intricate system. Healthcare includes the most complex procedures and systems as well as more simple healthcare functions. These systems highly depend on people and how people function. The management of HR is no longer a paper-based or even a spreadsheet-based exercise. It demands highly integrated and sophisticated IS and technologies to support the management of HR.

This chapter provides the background information relating to E-HRM and HRIS's impact on organisations. The literature was developed using Emerald, Scopus, Google Scholar, EBSCOhost, Oxford Business Group, and ProQuest databases. Keywords identified from the

title, problem statement and research questions were used as guides to building up the literature, with more keywords identified added to extend the process.

2.2   HUMAN RESOURCE MANAGEMENT (HRM)

HRM concepts have centred on enhancing the essential asset in any sector with a vision of attaining a competitive advantage in terms of human performance. Employees are an asset (Malik, 2016). To compete effectively, HRM sectors must improve their performance by reducing costs, differentiating, and improving the quality of services rendered. Due to unstable political, economic, and technological environmental factors, organisations have to be prepared and equipped to accommodate their environment to remain active in various sectors (Maina, 2017).

Fatema (2014) observed that in most countries, HRM practices displayed entrenched historical, social, political, economic and institutional disparities. Also, it was found that outdated HR practices created low productivity and motivation of employees. The use of upgraded HRM practices using electronic processes can transform employee management in those countries.

Studies have shown that effective HR is the basis of a sustainable, competitive, and efficient workforce (Kosturova & Hasan, 2014). Khatri (2015) contends that various sectors need to emphasize their competitive strength to sustain a suitable long-term strategy. Competitive advantage rests mainly on an effective HR facilitating the system (Mutahi & Busienei, 2015). However, effective HR is being pursued by both national and provincial platforms due to globalisation. For organisations to last in the world economy, they would be expected to have standardized HR capabilities and processes to manage their workforce. The procedure of management of HR is also known as HR practices that can be thoroughly engaged to create a sustainable competitive advantage (Alzhrani, 2020).

In a study conducted by Zongjun (2019) on the factors affecting employees' productivity in organisational development, HR has been identified as a significant factor in the existence and progress of organisations. However, Zongjun's (2019) study aimed to determine the crucial factors that affect employees' productivity in organisations and concluded by identifying the three major factors that affect the productivity of employees: poor working environment, unfavourable welfare procedures and poor rewards. There is a need to conduct a study to find ways to keep employees and motivate them to improve in their work (Nayak, 2016).

The management of people is one of the major factors of organisational success. Unfortunately, in the past, less consideration was focused on the effective management of HR in the South African health sector for reasons such as a relentless scuffle for acknowledgement of HR as a critical organisational function (Grobler et al., 2018). The consciousness of the shortfalls of HRM surfaced as a proper function in organisations compared to health sectors in other countries where HRM is considered critical to the success of the sector (Carrell et al., 1999; Turek & Wojtczuk-Turek, 2015).

2.2.1 Definition of HRM

HRM is defined by Armstrong (2014:5) as "a strategic, integrated and coherent approach to the employment, development and well-being of the people working in organisations". HRM was initially constrained to three functions known as administration, salaries and recruitment, although most organisations realised that these three functions were not sufficient to define effective HRM (James, 2006). However, in 2001 the Minister of Labour in SA launched an HR strategy for government departments to explore the skills and knowledge to compete with high-income countries (HIC) by introducing a different HR strategy of using a cloud-based HR system in the public sector. However, this strategy is yet to be accomplished (Mishra, 2020).

A report by the World Economic Forum (WEF) (2017) rated SA as 61 out of 137 countries that have sophisticated HRM services. However, the WEF report further mentioned that low levels of HR strategy achievement in Africa were due to labour market deficiency and unreliable educational institutions to educate people on how to interact with HR-related technology. However, Eboreime et al. (2017) believe that healthcare strategy in a decentralised system of governance has difficulty closing the identified gaps concerning achieving HR strategy implementation. Essentially, most government sectors are not compliant with the WEF reports on HRM strategy accomplishment due to a lack of sufficient funds and commitment (Bawontuo et al., 2021:2).

The production of efficient reports in HRM is vital. Zaiter et al. (2021) contend that the complexity of HRMs not producing efficient HR reports due to a lack of adequate IS warrants studies to investigate the underlying factors. Sharma (2014) explains that effective IS in HRM could become a competitive advantage. Seitio-Kgokgwe, Gauld, Hill and Barnett (2016) identify different factors that could negatively affect HRM in the health sector, including insufficient planning, poor deployment, underutilisation of staff, and lack of effective retention strategy and poor working conditions. These factors could partly explain the poor HRM performance in the public health sector (Mansour et al., 2022). Thus, Seitio-Kgokgwe et al.

(2016) recommend further studies to identify ways to improve the HRM performance in the public health system by putting in place effective IS.

Grobler et al. (2018) explain that in a highly competitive market, the management of humans is critical to the success of any organisation. Unfortunately, very little attention is paid to effective HRM as a legitimate organisational function (Grobler et al., 2018). In the health sector, HRD should be involved in recruiting, selecting, interviewing, training, appraising, rewarding employees, and managing payroll, compensation, incentives, leaves, vacations, employee profiles and admission letters. Yet the use of HRD to achieve such an objective is not very effective, so a study on how IS can be used to improve HRM needs to be conducted (Assaf et al., 2017).

2.2.2 Functions of HRM

Some of the functions of HRM identified by Assaf et al. (2017:63) are staffing, training, HR development, reward and benefits system, employee labour relations, and health and safety. Al Mamun (2019:16) also identified the functions of HRM as "job design and analysis, human resource planning, recruitment selection orientation, performance management, training and development, reward management, health and safety management, discipline management and employee relations". For effective HRM functioning to be in place, management needs to use electronic tools to perform several tasks in the organisation. Tasks such as forecasting the need for staff, filling vacant positions, deciding whether to use temporary or permanent staff, selecting and training the best employees, supervising work and complementing the relationship between the health facility and employees are essential (Renu, 2014; Ali et al., 2021:6795). However, the performance of these tasks could deprive the attainment of HRM tasks without the electronic functions of HRM performance in organisations.

Wairimu and Ndeto's (2019) study on the influence of HRM strategies on employee retention observed that some organisations provide clear job descriptions to advertise vacant job positions. The applications received are manually scrutinised, and candidates are chosen and invited for interviews. This indicates that some HRM functions are still manually adopted and that organisations have to establish a proper IS for the employee recruitment process with adequate functioning and strategizing of the HRM (Katalin, 2015).

Mujeeb (2012) and Hamad et al. (2019) identify some of the challenges facing the proper functioning of HRM. According to them, there were no overall HR policies and development plans. There was also a lack of coordination and poor decision-making in HRD. HRM record-keeping was manually done and operated in isolation (Hamad et al., 2019:20) leading to the

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arduous task of transferring HRM data from one sector to another within the health department (Ali et al., 2021). To eliminate these challenges, it is critical to optimally use existing healthcare workers in the public sector by managing them properly. The need to investigate the use of an IS such as eHRM for proper planning is evident (Yadav, 2014).

2.2.3 Electronic-human resource management (E-HRM)

In achieving Sustainable Development Goals (SDG), the speedy growth of IS, particularly the use of the internet and computer software technology, has brought significant changes in the economy, society, and the culture of growing economies. In recent years, with the introduction of various ISs, a new wave of HR technology known as electronic-human resource management (E-HRM) has emerged (Hooi, 2006; Girisha, 2021). The term E-HRM was devised in the early 1980s. According to Lengnick-Hall and Moritz (2003), E-HRM signifies the ability to perform HRM functions through the internet or intranet, which is the upgrading from a manual system to an automated method of HRM. The introduction of E-HRM permitted a more effective and strategic way of executing HR functions in a technologically advanced form (Stone & Dulebohn, 2013). E-HRM provides HR functions with the opportunity to create new possibilities for contributing to organisational success (Agarwal & Lenka, 2018). However, eliminating a manual system of HRM requires adopting an electronic records management system for HR records storage which includes features related to the capture, description, management, storage dissemination and retention of HRM information (Hamad et al., 2020).

2.2.3.1 Definition of E-HRM

E-HRM is defined by Strohmeier (2007:20) as "the application of IT for networking and supporting of two or more individuals or collective actors in their shared performance of HRM activities". Tursunbayeva et al. (2015:4) also define E-HRM as "a way of implementing HR strategies, policies, and practices in organisations through a conscious and directed support of the full use of web-technology-based channels". E-HRM is, in essence, the devolution of HR functions to management and employees; however, the combination of both E-HRM definitions above seems to fit the introduction of HRIS usage in organisations for an updated technology application in HRM.

2.2.3.2 Types of E-HRM

There are three types of E-HRM as identified by Altaf, Rehman, Sandhu and Shahidan (2019:1661), namely: i) operational, ii) relational, and iii) transformational E-HRM.

- **Operational E-HRM** is associated with organisational functions such as payroll and employee personal details. It provides a system where employees are expected to safeguard their personal information and update it whenever it is needed through an HR website or have an HR administrative body that does it.

- **Relational E-HRM** is associated with the support of the administrative functions through training, recruitment, and performance management. It further emphasises that in this process, it gives a choice of assisting recruitment and selection through an HR website application or using a paper-based method through advertisement. Paper-based filing methods are applications and other forms of manual recruitment sources.

- **Transformational E-HRM** is associated with the strategic functions of HR activities such as knowledge management and strategic re-orientation. It further indicates that a transformational E-HRM can create a ready-changed workforce through a combined set of HR websites that permits the workforce to develop in line with the organisation's strategic choices or to do it manually in a paper-based form.

The effective use of IS in an organisation will combine the organisational, administrative, and strategic functions of the E-HRM functions to have a successful IS in place.

2.2.3.3 The role of E-HRM

The role of HRM is significantly related to the recruitment, selection, development, training, compensation, retention, evaluation and promotion of the workforce within an organisation (Bernardin & Russell, 1993; Barifaijo, 2016). E-HRM has also been recognised as a significant version of HRM that could assist to ease the burden on HR functions (Ma & Ye, 2015; Nachit & Okar, 2020), creating a vibrant and operational fitness that contributes greatly to HRM facing its important challenges.

However, E-HRM and HRM functions are comparable in HR procurement and maintenance, identification of individual and organisational performance, organisational workforce planning, and reward of employees (Al Mamun, 2019). Consequently, the practice of E-HRM technology in an organisation is similar to applying HR strategies, policies and practices and abiding by the HR requirements in organisations through a web-based network (Rüel, Bondarouk & Looise, 2004; Jabbar & Khurshid, 2020). Essentially, E-HRM could provide a function that allows employees in an organisation, including the HR and IT personnel, to view, extract, and update their personal information critical to every individual employee's management and control.

The decline in cost, better quality, service delivery, and changes in the work process are the main forces that drive organisations to seek HR-driven IS solutions (Ukandu, Iwu & Allen-Ile,

2014). Perhaps HR can be more strategic, flexible, and cost-effective when operated electronically and has the potential to reduce administrative costs, improve productivity, give rapid response times, portray effective decision-making, and also improve service delivery at all times (Tandon, Saxena & Chitkara, 2015). Therefore, the institution of E-HRM serves to assist organisations in providing greater HR services more professionally and in assisting in the realisation of workforce expectations, which were previously not attainable (Kovach & Cathcart, 1999; Anjum & Islam, 2020).

The effectiveness of E-HRM could assist organisations to achieve better performance in their HRM through the enhancement of the IS revolution. The IS revolution could function as a process of helping E-HRM to focus more on value-added HR activities and capture the information systems' full potential for organisational strategy (Mohan & Gomathis, 2014). However, the most crucial benefit of using the E-HRM system is the transformation of HR functions from their administrative roles to strategic roles, which will finally create organisational development.

2.2.3.4   *Factors that deter the effective use of E-HRM systems*

Several studies have been conducted on the factors that affect the effective use of E-HRM systems (Ruël, Bondarouk & Van Der Velde, 2007; Yusoff, Ramayah & Othman, 2015; Rahman, Mordi & Nwagbara, 2018). Some of these factors are: i) employees' attitude towards E-HRM, ii) comprehension of E-HRM techniques, iii) the negative impact of individual assessments, iv) working environment and the orientation of HRM, v) reputation of organisations, and vi) the cloud ecosystem.

2.2.3.4.1   *Employees' attitude towards E-HRM*

Voermans and van Veldhoven (2007) reported on attitudes towards E-HRM and found that there were dissimilarities in the actual usage of IS and their significant roles in HR. To achieve effective E-HRM requires the integration of IS.

2.2.3.4.2   *Comprehension of E-HRM techniques*

Olivas-Lujan, Ramirez and Zapata-Cantu (2007) investigated how four competitive organisations applied their E-HRM strategies and realised that it is challenging for those organisations to comprehend E-HRM techniques fully. E-HRM is in high demand among

organisations in developing economies, and there is a need to introduce an IS to take over the HRM processes to simplify the work (Olivas-Lujan et al., 2007).

2.2.3.4.3 Negative impact of individual assessments

In a study conducted by Rüel, Bondarouk and Van der Velde (2007) on E-HRM's effectiveness, it was realised that individual assessment of E-HRM applications might have a negative impact on HRM practical, administrative and strategic efficiency. It was also found that E-HRM usage is expected to assist in reducing costs of administration, improve the work of the HR, and provide the HRD with an opportunity to become a strategic partner in the organisation. These expectations are deterred from being achieved and cannot be achieved without introducing an effective IS in the HRM.

2.2.3.4.4 Working environment and the orientation of HRM

In Strohmeier and Kabst's (2009) study on the factors that affect the adoption of E-HRM in a multinational organisation, it is noted that E-HRM is a common HR practice in a developed economy. Strohmeier and Kabst (2009) also reported that the major factors that deter E-HRM adoption are the organisation's size, the working environment and the orientation of HRM.

2.2.3.4.5 Reputation of organisations

Laumer, Eckhardt and Weitzel (2010) conducted a study on E-HRM in a business environment and discovered that the most difficult challenge faced by the HRD is the reputation of organisations. They highlighted the image and skilled workforce retention as part of the reputation challenges. They concluded that an E-HRM must effectively identify available vacancies and make good use of scarce resources to achieve a successful HRD.

2.2.3.4.6 The cloud ecosystem

Hamad et al. (2019:10) conducted a study to identify the most significant elements related to managerial decisions for adopting E-HRM-based cloud computing systems in the healthcare sector. These elements are: i) cloud healthcare applications, ii) cloud services, iii) cloud deployment, iv) cloud control, and v) cloud solutions. There is a need to conduct studies on how E-HRM cloud-based computer systems can be implemented to support managerial decisions in the health sector.

2.3   HUMAN RESOURCE MANAGEMENT INFORMATION SYSTEMS

Human Resource Management Information Systems (HRMIS) is defined by Hendrickson (2003:383) "as a systematic way of gathering and processing management information system regarding HR matters using computer gadgets which include hardware and software for storage and processing of HR management data." Lekgela (2017:36) notes that HRMIS is referred to "as a tool for effective management decision-making through the incorporation of HRM and IS to improve and facilitate the decision-making process and also accelerate the flow of critical information in organisations when it is required".

Malindadi (2016) mentioned that HRMIS was introduced in 1999 to ensure that HRM in the public sector can produce a skilled, trained and motivated workforce. It was developed based on critical principles identified by Zahari, Harun and Baniamin (2017:54). HRMIS are a major form of IS used by many governments and organisations worldwide for the effective management of HR. For a strategic approach towards HRM to be achieved, emphasis should be placed on positive values, performance-oriented management and priority accorded to HR, conditions of service that encourage reward for performance, and monitoring and evaluating innovative reforms.

The Malaysian government, for instance, introduced HRMIS to achieve a sustainable workforce structure in the management of public sector employees (Zahari et al., 2017; Karpagambigai & Poornimarani, 2020). However, Shahibi, Saidin, Adil and Izhar (2016) noted that the significant challenges affecting the use of HRMIS in Malaysia are that the HRD did not fully implement the system. For that reason, they are not compliant with the HRMIS usage standards. They make use of a few models such as Personal Records (PR), Establishment Data (ED), Service Records (SR), and Asset Declarations (AD), as most of the HR functions were performed manually. This kind of practice creates dissatisfaction among workers in the public sector of the country (Liu, Fu, Wang & Fang, 2014).

Interestingly, Singh and Bakshi (2018) attempted to identify a new form of technology in organisations to record employee attendance, transfers and promotion, and how such information could be effectively used for employee performance appraisals. Zahari et al. (2017) noted that if governments decide to use HRMIS, they would need the support of all the stakeholders in the public service to have an integrated HRMIS in the system. An integrated HRMIS will assist the public sector in achieving highly desirable objectives such as adequate staffing that corresponds with the right size of the civil service, automating HRM operational process, improving a paperless HR environment and providing an open and flexible HR system (Zahari et al., 2017; Mutio & Samuel, 2022).

2.3.1 Characteristics of HRMIS

According to Wahab (2011:28), numerous characteristics that relate to HRMIS as effective decision-making tools are as follows: "HR planning, employee training and development, employment benefits and regulations, decisions related to service quality, effective decision, assigning leadership development and evaluation of alternatives". Li (2021:2) also identified other HRMIS characteristics to include: i) "selection of best alternatives, ii) hiring of new employees, iii) training and skill development decisions, iv) compensation management, v) job evaluation and downsizing, vi) legal labour management relations, vii) agenda-setting, and viii) competitive and strategic approach". These characteristics are not easily achieved, but effective management of HRD using IS will go a long way in putting things in place in the HRD through HRMIS.

2.3.2 The implementation of HRMIS

The implementation of HRMIS refers to performance in organisations. A study on skills intervention analysis in the public sector, using a theoretical approach to HRMIS, identified the gaps between the skills required to perform the service delivery functions and the basic skills available (Wall & Vienings, 2017). Walls and Viening (2017) further indicated that the lack of effective administration of HRMIS in the public sector, by not identifying vacant positions, qualifications, and current staff lists, created gaps between required skills and available skills. However, the use of HRMIS was supposed to assist the public sector in identifying better opportunities and ways to retain the workforce, which is still a gap that needs to be researched.

The lack of proper documentation of the workers in the system for adequate tracking of their movements makes the worker tracking system unreliable (Gurmessa, 2019). However, Adam and Suleiman (2018:56) propose the need for the government to provide policies for support concerning workers tracking systems. Adam and Suleiman (2018) further introduced statistical data using HRMIS for the entire management of the public sector to produce an annual financial and statistical report on the implementation of workforce projects, as well as monitoring and evaluating of reports for executive-level decisions. However, Zahari et al. (2017) proposed a further investigation on motivating the authorities to support the implementation of IS in countries like SA through supporting capacities to build efficient public sector workforce management.

2.4   HUMAN RESOURCE INFORMATION SYSTEM (HRIS)

As far back as 2005, Lippert and Swiercz (2005) noted that the knowledge economy demanded that organisations take HR performance seriously as their growth depended on HR. The above notion was reiterated by Boateng (2007), who added that the most challenging aspects of organisational performance were knowledge sharing and workforce analytics which HR management needed for their significant contribution to strategic management. This process is attributed to HR technologies, such as HRIS, which consists of systematic procedures and functions for keeping a record of employees' personnel details to increase effectiveness, such that HRM has made organisations increasingly reliant on HRIS (Troshani, Jerram & Hill, 2011).

HRIS is referred to as the combination of HR and IT structures such as software, hardware, support functions, system policies and procedures into an automated process formulated to harness the strategic and operational activities of the HRD and managers in an organisation (Gautam, 2017; Shamaileh & Al Sarayreh, 2022). At the operational level, HRIS can assist in keeping track of information concerning employee qualifications, recruitment, professional growth, performance appraisal, payroll, retention and attrition in an organisation (Anupa, 2021:22). However, the recent developments in IS have made it likely to create real-time information based on self-service and a collaborative working environment (Bothma, 2015). Personnel IS has advanced from the automated workforce record keeping from the 1960s to the more complex reporting and decision systems of modern days (Kavanagh et al., 1990; Methuku & Ramadan, 2013).

2.4.1   Definition of HRIS

There are numerous definitions of HRIS by different authors, and each definition portrays a further understanding of what HRIS means. The definitions of HRIS, according to various authors, are as follows:

Kavanagh et al. (1990:13) define HRIS "as a system used to acquire, store, manipulate, analyse, retrieve and distribute information regarding an organisation's HR". "HRIS is a systematic procedure for maintaining, collecting, storing, retrieving and validating information belonging to an organisation, such information can relate to the organisations' HR, personnel activities and organisational characteristics" (Kovach & Cathcart, 1999:276). Hendrickson (2003:19) adds that HRIS includes "people, policies, procedures and data that is required to manage HR functions, also the applications system that composes the technical part being the hardware and software applications, also makeup HRIS". Hendrickson's (2003) identification

emphasises the idea of HRIS seen as a crucial IS with many facets in an organisation. In his view, HRIS is not only represented by computer-based tasks or HR-related programmes; instead, it broadly involves people, structures, strategies, processes, and information. Belcourt, Bohlander, Snell and Sherman (2011:276) take the view that "HRIS is a system that develops current and accurate information for decision-making and monitoring".

HRIS is also described as "a computerized system typically comprising a database or interrelated database that tracks employees and their employment-specific information" (Aggarwal & Kapoor, 2012:2). According to Chugh (2014:149), HRIS is also referred to as a set of interrelated and systematic components that assist in collecting, storing and distributing information to support decisions and benefits in an organisation. Sireesha and Ganapavarapu (2015:16) also define HRIS as "a software containing a database that allows the entering, storage and manipulation of data regarding employees of a company. It allows the global visualization and access to important employee information." HRIS is described as "the composite of systematic database, computer applications, hardware and software necessary to collect/record, store, manage, deliver, present, and manipulate data for human resources." (Tursunbayeva et al., 2015:4). Boon, Den Hartog and Lepak's (2019:2) study agrees with Chugh (2014) that HRIS focus should be systematic because employees are simultaneously exposed to an interoperable set of HRIS rather than a single platform. They also mention that the effects depend on the sophisticated system in place. However, Zafar, Randolph and Martin (2017:60) indicate that a computerised system such as HRIS is just for collecting, storing, maintaining, and retrieving information. Organisations require data relating to their workforce and help in planning, administrating, decision-making functions, and controlling HRM activities.

The various definitions of HRIS point to significant identifiers such as: i) a computerised system for collecting and recording various HR functions which assist with maintaining staff information, ii) monitoring salary operations, iii) keeping information about absenteeism, iv) conducting administrative duties, v) employment and training programmes and other HR-related functions for the effective management of all HR functions, taking the cue from researchers such as Belcourt et al. (2011), Bayraktaroglu, Kahya, Atay and Ilhan (2019), Jayabalan, Makhbul, Selvanathan and Subramaniam (2020), Prasad (2020), Wahid and Kurnianda (2021), Mohammed (2021) and Anupa (2021), Practically, HRIS boosts the planning, administration and decision-making roles of the HR department.

2.4.2   Types of HRIS software programmes in the market

HRIS is a general term for all the software products used for HRM operations in an organisation. Although there are different types of such products in the market, the selection

will depend on the purchasing power, the product an employer chooses, and what the IT vendors can deliver to suit the requirement of the organisation/management (Nurdin, 2019). According to Wairimu and Ndeto (2019), the proficiencies attained from extensive use of HRIS and E-HR allow attraction and retention of workforces needed to build organisations' success and profitability. HRIS is an organisational-level solution that is provided by vendors such as SAP HR, Oracle, PeopleSoft, CheckPoint HR, Epicore, Lawson, and PERSAL, amongst others. These are some of the prominently used HRIS in the market (Tariq, Sang & Gulzar, 2016; Tesha, 2020).

Chen's (2014:75) study mentioned that the management of HRIS using a streaming data model has been used to monitor employees in various organisations. However, it was found that a lack of data accuracy was to blame for the ineffective use of these systems (Bhattacharyya et al., 2021). Perhaps choosing and making good use of an appropriate HRIS does more than eliminate administrative procedures, increase efficiency and reduce the cost of employment and other functions relating to HR (Shaji & Kavitha, 2017). Furthermore, HRIS can assist in developing a better HR culture that can enhance fulfilment and confidence, moderate turnover, and build a stronger, more inspired, and reliable workforce. Zafar (2013:106) states that HRIS is a stand-alone system not meant only for employee personnel information. HRIS also extends to rewards, remuneration, recruitment, retention, training, development of talented and skilled applicants, and managing workforce performance, making the usage of HRIS crucial to any organisation's growth. The HRIS software programmes are itemised below:

2.4.2.1 System Application Product (SAP)

Many corporations have introduced new systems to assist in upgrading and managing their HR processes and linking different sections and departments together. All of this can be linked through a single Enterprise Resource Planning (ERP) platform for HRIS (Thakur, 2016:2). Besides, Khoualdi and Basahel (2014:29) indicate that SAP is part of the ERP platform introduced in 1972 by three German programmers who were initially working for IBM. They resigned and set up SAP on their own. The company is located in Walldorf, Germany and, as of 2008, has approximately 52,000 workers (Leimbach, 2008). SAP is regarded as one of the most prominent, famous and most used software products (Saghar, 2021). However, SAP is not only meant for HR but has different software for different sections of an organisation from HR, administration, accounts, and management, amongst others. Gargeya and Brady (2005) note that SAP has become the most comprehensive software, although it is expensive in running programmes for an entire organisation. However, it can be acquired according to what

an organisation can afford and use irrespective of the size and type of business operation (Tursunbayeva, 2019).

2.4.2.2 Oracle Programme

Oracle is another ERP software product for HRIS, developed by Gretchen Alarcon, the vice president of human capital management strategy for Redwood Shores Software Company in California (Jahan, 2014:35). The product was initially introduced strictly for HRM processes and has been on the increase in demand by numerous companies in the world. According to Alzhrani (2020:17), it has been noted that the licencing cost of ERP technology spent on acquiring an HRIS programme ends up becoming a substantial saving to Oracle users due to the benefits in terms of security of workers' information that the system could provide for organisations.

2.4.2.3 PeopleSoft Solutions

J.D. Edwards World Solution Company developed PeopleSoft in 1977 in Denver, Colorado. It was developed by Jack Thompson, Dan Gregory and Ed McVaney (Engelsrud, 2019). The company was eventually sold to Oracle in 2005. To this day, both the software's products (Oracle and PeopleSoft) are still in high demand in the management of HR in organisations. According to Alzhrani (2020:17), PeopleSoft Solutions was introduced in the same way as SAP and Oracle and serves different sizes of organisations to integrate all the accounting, HR and other business solutions of organisations. The integration of systems was important for companies as they wanted to combine payroll, general ledger, inventory, fixed assets, job costs and other management functionalities in one organisational portal.

2.4.2.4 Checkpoint Systems

Checkpoint Systems is an American software provider company started in the 1960s by a team of researchers working in a privately owned paperboard and paper invention company in the United States. The checkpoint was made to assist in preventing stock losses in terms of theft and offers electronic article surveillance (Kulik, Kulik & Perry, 2004). This programme was taken to a higher level when the function expanded into HR management. In 2006, Microsoft acquired Checkpoint to bring Microsoft's merchandise visibility to a cloud base and assist in performing analytical tool processes as part of HRIS functionality (Zafar, 2013:105).

2.4.2.5 Epicor Software Solutions

Epicor Software Corporation was started in 1972 as Triad Systems Corporation for global business software solutions, and in 2003 the name was changed to Activant Solutions Inc. (Laizer & Suomi, 2017). The company was based in Austin, Texas and was introduced to assist manufacturing, distribution, retail and services rendering organisations (Zafar, 2013:105). However, Epicor Software has made a name for itself like other software in the market in the running of HR activities in organisations irrespective of the organisation's size (Gunadi & Widianto, 2020). Various companies have since acquired it, and on 31 August 2020, the company was sold to CD&R.

2.4.2.6 Lawson Software Solutions

INFOR Global Solutions acquired Lawson Software Solution on 1st July 2010 as part of their over 40 software companies (Kl, Šulová & Sodomka, 2010). They are a multinational Enterprise Software Company based in New York, specialising in software digital solutions. Their focus is on HR and business applications for organisations and government departments that require cloud computing services and information value advancement, to assist in their management to identify, quantify, realise and measure tangible organisational value from technology solutions (Tesha, 2020:44). Furthermore, their digital solutions help their clients build and execute digital strategies, including advanced analytics, artificial intelligence, cloud mobile, social and machine learning, amongst others. Lawson software is one of the HRIS solutions that are highly in demand in the software digital solution market (Valcik et al., 2021).

2.4.2.7 PERSAL system

Personnel and Salaries Management System (PERSAL) is an HRIS software solution used by countries such as South Africa to manage most of the government departments' workforce information (Mathews, 2017:124). However, the idea of the SA government in the implementation of PERSAL was to assist in combating payroll fraud. It was observed that most departments had not upgraded their PERSAL system. Only a few departments such as agriculture, correctional services, home affairs, and police service have an upgraded PERSAL system (Hadebe, 2021). However, some government departments, such as the Department of Health of SA are still lacking in the use of an upgraded PERSAL system (Padarath, Ntulii & Berthiaume, 2003; Zondi & Day, 2019).

The software solutions mentioned in section 2.4.2 are among the numerous HRISs in the market. They are used to perform HRM functions on different levels. Depending on what the management of organisations needs to achieve and what they can afford, it will determine the HRIS software to acquire.

2.4.3 Importance of HRIS to organisations

HRIS is very important in that it provides HR professionals with the opportunity to improve their advancement of organisational strategic objectives by automating and relieving line management of many monotonous HR tasks (Chakraborty & Khan, 2019). It also provides HR professionals and management with the required time to direct their attention towards strategic task levels such as leadership skills and knowledge management (Aggarwal & Kapoor, 2012; Priota, 2020). According to Kumara and Galhena (2021), important HRIS functions are:

- Develop programmes and policies relating to HR.

- Speed up decision-making in spaces like promotion, transfer, nomination, setting employee provident funds, retirement, gratuity, leave travel concession and earned leave compensation.

- Supply of data and submission of returns to government and other statutory bodies.

- Collect appropriate data and convert it into valuable information and knowledge to improve timeless and quality decision-making.

- Produce accurate and real-time HR-related reports.

- Increase competitiveness by re-engineering HR processes and functions.

- Improve workforce satisfaction by delivering HR services much faster and more accurately.

- Provide comprehensive information as a single, integrated database that enables organisations to provide essential connectivity across different units/departments and activities to increase the speed of information transactions.

2.4.4 Components of HRIS

According to Tomanna, Gerbi, Hossin and Zhang (2018:41), there are three functional components of HRIS, as shown in Figure 2.2:

Figure 2.2: Components of HRIS
(Tomanna et al., 2018:41)

2.4.4.1 Input

The input component requires the HR competencies needed to upload HR data into the HRIS. Personnel information is uploaded into the system through the input process. All the processes and procedures are then required to collate all the necessary data. The data is then uploaded into the system one at a time and edited to ensure that it has been correctly captured (Göktaş & Akgül, 2019). However, it has an editing table where an approved option is used to validate the authenticity of the captured data, checked and approved by the authorities responsible (Tomanna et al., 2018:41). Papa (2016) highlights that a developed HRIS consists of major applications software such as an HR system, biometric system, and payroll alert system, and can also be capable of updating and making changes quickly. Furthermore, the HRIS can also have a scanning option where documents can be scanned and stored in an actual image, including signatures and handwritten documents.

2.4.4.2 Data maintenance

The data maintenance function oversees updating the data stored in the HRIS as changes occur in the system. Data maintenance is incorporated into the system when new data is added to the HRIS. The old data is stored as historical information as a backup if any problems arise, such as system crashes (Kalwala & Sekhar, 2019:2688). Perhaps the system automatically updates and adds newly captured data to the database after it has been uploaded.

2.4.4.3 Output

Output is the most visible component of HRIS because most of the users are not involved with collecting, editing, and updating HR data. They are only concerned with information and reports generated from the systems that will be used for the decision-making process (Jayabalan et al., 2020:311). However, to create valuable output for decision-making, the

system will have to make the necessary calculations and format the presentation of the data to be easily understood by the users (Wahab, 2011; Kiros, 2018).

2.4.5   Functions of HRIS

HRIS functions are interchangeable with the HRM system in HR planning, staffing, training, career development, performance appraisal and compensation management (Kavanagh et al., 1990; Qaisar, Shahzad & Arif, 2018). HRIS functions are categorised according to Lema (2018) as follows:

- **Create and maintain employee records:** HRD administrators are responsible for creating employee records in the HRIS system, and that information will remain throughout the worker's employment life.

- **Ensure legal compliance:** the information entered in the system must be correct and in compliance with the legislation of the government on any issues that relates to employees and taxes.

- **HR planning and forecasting:** the system can assist the organisation in developing long-range staffing plans and provide helpful information relating to employees to the HR professional council. It usually gets information from recruitment, administrative systems, training, and development, indicating vacancies, skills, competencies, and employee turnover rates.

- **Talent/knowledge management:** in the system, the captured data such as skills, competencies, job description, and training acquired, and development interests of the employee can be used by the authorities to plan for their employee's development opportunities. This also ensures that candidates fill the correct positions and are in the right departments where they can develop their skills.

Kavanagh, Thite and Johnson (2015) explain that part of the function of HRIS is the implementation of development plans that are required to align with the workers' and organisational needs. They state that this is done in the following ways (Kavanagh et al., 2015):

- **Strategic alignment:** in the system, the data retrieved can assist organisations in making sure that their HR events are more effectively aligned with their strategic plans.

- **Enhanced decision making:** the data retrieved from the system needs to be relevant, useful, timely and accurate to be used by management to create and improve the quality of management decisions**.**

However, some of the HRISs used in organisations are not performing the expected functions as required by Kavanagh et al. (2015), which is a problem some organisations face.

2.4.6 Advantages of HRIS

Various researchers have listed the advantages of HRISs. Kovach, Hughes, Fagan and Maggitti (2002:44) identified the advantages of HRIS to be: i) speedy delivery of complex data and information, ii) reliability and accuracy of the information generated from the system, iii) storage and retrieval of large data, iv) consolidation of all employees information in a system, and v) creating reliable decisions. Šušnjar, Slavić and Berber (2013:223) also identified some of the advantages of HRIS as: i) automation of the HRD functions, ii) improving administrative efficiency by fast-tracking information processing, iii) workforce communication and effective information accuracy, iv) lower cost and productivity improvement in HR. However, Buzkan (2016) also indicated that part of the advantages is that an HRIS can contribute to an organisation's strategic decision in terms of leadership and talent management development, which creates an opportunity for HR to play a leading role in the overall strategic decision-making process. Also, the HRIS's role influences HR participation in strategic decision-making. Easy access to HR data, regulation of HR processes, and consistency of employee information are also some of the advantages HRIS serves in processing HR functions. Essentially, Gautam (2017:271) was able to identify some of the significant advantages of HRIS as the following:

- **Optimal goal setting:** making the goal-setting specific, measurable, attainable, relevant, and timely.

- **Performance tracking:** helping to view employees' performance from a distance for easy real-time performance and improvement opportunities.

- **Quick feedback:** assist management by giving feedback to employees on what their performance was and how to improve on it.

- **Ties actions to concerns:** gives real-time reports where managers can make decisions based on the real-time performance of the employees.

- **Collect feedback from peers:** opens up an opportunity to track the performance of employees from other employers and departments and extract the information and feedback for the managers to use in making decisions relating to the employees.

- **Performance reviews:** regular usage of HRIS to track workforce training and achievements makes reviewing their performance much more accessible and controllable.

- **Goal setting options:** some HRISs with a self-service module allow workers to set their own goals, which help the management to monitor, manage and approve those goals without having any face-to-face contact with the workers.

- **Development and training:** HRIS, when accessed by employees, will help them empower themselves in terms of autonomous advancement in their training skills through the system.

- **360-degree reviews:** the system allows managers, peers, and customers to provide feedback on the worker's performance to be used to review their overall performance in the workplace.

- **Self-assessment by employees:** in this situation, the system empowers the employee to evaluate their performance, thereby making them feel less defensive in performing their assessment.

- **Employee surveys:** the system allows the employees to conduct opinion surveys on how to improve their performance in the workplace.

2.4.7   Benefits of HRIS

The use of HRIS assists organisations in record keeping, analysing employees' documents and information that can be easily retrieved whenever needed to prepare reports and other documents that relate to the workforce in organisations. These functions demonstrate the benefits of using HRIS (David, Shukla & Gupta, 2015; Udekwe & de la Harpe, 2017). Aigbavboa and Thwala (2019:4) note that the benefits of HRIS can be classified into three sections, namely management, HRD and workforce, as explained below:

2.4.7.1 Management

Management benefits deal with the improvement in the decision-making process, effective budget control measures, cost reduction, clear vision and transparency in service rendering and the rigorous process of hiring and firing workers at the top level.

2.4.7.2 Human resource department

Benefits for the HRD lie in the control of a single database of all the employees in the organisation and the preparation of different forms of reports simultaneously. The capability to update the database on time is of great importance, reducing human error, enhancing management decisions in harmony with legislative rights, abolishing redundancy in the organisation, and regulating Business Process Automation (BPA). The abolition of paper based HRM is an added advantage as this reduces error and duplication of records.

2.4.7.3 Workforce

The benefits are timesaving, making it possible for individual employees to access their data. Also, the availability of this data at any given point in time helps increase employees'

confidence, including automating all the organisation's responsibilities and events. This inspires the workers to make decisions with data obtained from the system and the ability to develop the personal skills and knowledge of employees through web-based training.

Kumara and Galhena's (2021) study aligns with Aigbavboa and Thwala (2019) in mentioning that HRIS is a tool used for workforce training profiles, appraising training needs and also progression forecasting. However, the primary identified role of HR using HRIS is the workforce compensation and benefits, of which the system can assist in managing pay structures and flexible benefits administration. Nagadeepa and Shaji (2021:15) also mentioned that HRIS tools are used by three major groups of people in an organisation, namely: i) **managers:** for generating customised daily reports, ii) **technical staff:** for providing decision choices and opportunities, and iii) **the general workforce:** to look into their details, payslips and also make minor alterations in their recorded details.

However, for an effective training strategy to be in place as part of the HRIS benefits, a system with complete and integrated systems using web-based technologies is needed to manage the HR processes. This can be incorporated through the support of complete tasks, including appointments, remunerations, performances, evaluations, education, and training to conduct the staff performances within the healthcare sector (Appiagyei et al., 2014; King, 2021). Moreover, for an effective training strategy to be accomplished, it is necessary to strengthen the health workforce through up-scaling health workers' education and training through the HRIS for benefit purposes.

Interestingly, HRIS are likely to affect the revenue and service delivery channels beyond the reduction of cost and improvement of productivity (Al-Dmour & Zu, 2014:139). Furthermore, it can also enhance innovation, improve customer service satisfaction, and modify how workers relate to one another in different means of communication (David et al., 2015; Ngwenya, Aigbavboa & Thwala, 2019).

2.4.8   HRIS software modules/functionalities

In general, the modules/functionalities in HRIS are not standard since not all sectors/organisations and their operations are the same (Wandhe, 2020:10). This study highlights some of the functionalities that various researchers have mentioned because HRIS functionalities are different and could be customised according to the requirement and operation of organisations (Troshani et al., 2011). HRIS functionalities are made to suit the services rendered by various sectors in the economy. But that notwithstanding, several studies indicated that there are functionalities that most HRIS should have in their domain (DeSanctis,

1986; Li, 2021). Such functionalities, which according to Gautam (2017:273), are itemised below:

- **Recruitment:** the functionality handles all forms of the recruitment process through the IS, from posting an advertisement online, form filling, supporting documents, authorisation processes and application tracking. It also assists in building a talent pool that can be shuffled to select a suitable candidate when a vacancy is available.

- **On-boarding:** recruits are guided through an orientation process around the organisation and automatic notification to all the departments to inform them. Automated access and security passes are issued, which will be linked to the performance and talent management of the employee.

- **Performance management:** it automates the entire appraisal process of all the employees by recording and tracking the process to incorporate the competence framework and job standards of each employee.

- **Benefits performance:** the system can manage the worker's benefits like healthcare, pension, welfare packages, and other financial obligations.

- **Workforce management:** in some organisations, the system does the scheduling function, where it combines (time and attendance with leave management), in most cases, with other business intelligence like ERP to match workers' placement to shifting requirements.

- **Time and attendance:** the system tracks workers' attendance through time clock management and biometric systems. The payroll system mainly uses the results of the data from time and attendance.

- **Absence and leave management:** the system will automate allocating, booking, tracking, and monitoring attendance, absenteeism and leave documentation. The requests and approval process and the outcome of each process ensure that it is in line with the company regulations.

- **Learning and development:** the system is usually a starting point after the performance appraisal. It produces workforce training, bookings, and the follow-up and feedback processes and ensures that exercise expenditures do not exceed the budgeted cost.

- **Talent management:** the system is linked to recruitment, performance appraisal, and learning and development functionalities, where it assists in identifying people with exceptional and potential talent and sets up talent channels and succession planning processes to retain the recognised talents.

- **HR analytics:** this system usually combines with other HRIS functionalities where it provides reporting abilities in the form of archives of HR summation and comprehensive information. It also analyses and accesses the information stored in the HRM with that of other organisations and combines the data to enable strategic and predictive decisions for the organisation's progress.

Interestingly, the most critical HR personnel IS must-have functionalities such as: i) payroll, ii) self-service, iii) recruitment and selection, iv) benefits administration, v) scheduling, vi) time

and attendance, vii) performance management, viii) compensation management, ix) succession planning, x) position control, xi) learning management, xii) workflow management, xiii) mobile capabilities, xiv) employee engagement, and xv) workforce tracking (Das & Barman, 2018:4; Barišić et al., 2019). However, to measure the success of HRIS it will have to include the internal job positioning of workers, e-recruitment, and e-learning on the system (Ruël & Bondarouk, 2018:345). Perhaps HRIS can assist in communication and research by monitoring workers' performance and assisting in selecting adequate candidates for available positions. Such HRIS function is threatened by failures of software management which could lead to a lack of HRIS benefits in organisations (Hamad et al., 2019:21). Essentially, effective HRIS could assist in recognising available positions in an organisation to be effective and accurate and specify the positions to be filled and the skills required for these positions (Zeb-Obipi & Kalio, 2018:14).

Das and Barman's (2018) study supports Shiri (2012) as well as Kumkar and Rajhans (2015). These studies indicate that HRIS systems used in big organisations would probably have functionalities such as payroll, time and attendance, performance appraisal, benefits administration, HR management information system, recruiting and learning management, training system, performance record, management/employee self-service, analytics, employee re-assign functionality, scheduling, and absence management. These functionalities are further discussed below.

2.4.8.1 Payroll

Payroll is regarded as the most important and most used functionality in HRIS. It is where the capturing of the entire employee's financial records takes place. Both the payments and deductions are captured in this functionality. A company with a massive number of employees would need such functionality to assist them in the automation of their employee pay system. It manages wages, bonuses, benefits and even deductions such as taxes, provident funds, housing funds, pension funds and others (ElNakib, Ragheb, Youssef & Ghanem, 2021:175).

2.4.8.2 Time and absence management

Time and absence management are functionalities in the HRIS used to record time spent and or absence from work-related activities (Nachit & Okar, 2020:3). The absence functionality handles the issue of workers' attendance, lateness, and absenteeism at work. According to Papa (2016), there is a need to have an attendance monitoring system in the HRIS to assist the HRD in calculating the times of attendance of employees. This is because not having

absence management and monitoring in HRIS could cause delays in the preparation of payroll and updating of special leave days and credits of employees. Most studies have found that most organisations that use HRIS do not use this functionality in the HRIS. They prefer to use manual or other information systems for time and absence, which compromises the effectiveness of HRIS (Gupta, 2013:42). Tesha (2020) is also of the opinion that the adoption of HRIS in the health sector is a crucial situation because HR functions for job satisfaction tracking time and attendance tracking are not conducted through a biometric machine for effective monitoring of the health workforce.

2.4.8.3 Performance appraisal

Performance appraisal is functionality that deals with the accumulation and reporting of vital information relating to the performance of every worker. It involves a situation where a manager will have a session with their subordinates to discuss the stages of their performance, which will be used sometime in the year to engage the worker for promotion, salary adjustment and incentives (Oyaro, 2018:17). This process is a form of strategy in HRIS that is used to monitor workers' output to make sure that it aligns with the projected plan of the organisation. According to Widjaja, Maarif, Hendratno and Rachbini (2021), employees' performance appraisal results from the quality and quantity of work achieved by a person carrying out their duties and responsibilities assigned to them in the maintenance and improvement of organisational performance. A systematic performance process should be aligned with the HRIS for corporate competitive advantage. Siddiqui (2014:179) is also of the opinion that the success of an organisation depends on its employees' performance results, which are needed to ensure that workers are satisfied with their jobs, and such satisfaction needs to be monitored through an effective HRIS for benefits purposes.

2.4.8.4 Benefits administration

Benefits administration is functionality that deals with all the benefits that are meant for a worker, such as long service awards, insurance benefits, pension benefits, compensations, profit sharing, retirement benefits, dividend sharing, and 13th monthly payments (Kumkar & Rajhans, 2015:1955). Pieris and Preena (2020) note that HRIS providers could allow employees to establish and maintain their benefit components in the HRIS. The management can then effectively administer the benefits requested by the employees through the system from medical to retirement pension benefits.

2.4.8.5 Management Information System (MIS)

HR Management Information Systems (HRMIS) is a crucial HRIS functionality that covers most of the HR features from the inception of applying for a job to the retirement period of a worker (Kumkar & Rajhans, 2015:1955). The functionality keeps a record of the worker's demographic reports such as address, gender, sex, age, marital status, years of employment, position, dependent relatives, competencies and abilities management, reward planning records, training and improvement (Troshani et al., 2011; Davarpanah & Mohamed, 2020).

2.4.8.6 Recruitment system

A recruitment system is a functionality in HRIS used to conduct recruitment right from the application level via the internet and IS of an organisation. The data (resume or curriculum vitae) is captured directly into the HRIS of the organisation by the applicant in order not to be duplicated (Oyaro, 2018; Nurdin, 2019). Most organisations are not using this functionality in HRIS; some use manual and other forms of IS, which might not be appropriate. Effective HRIS can assist organisations in streamlining the recruitment process automatically and centrally, having both communication and data in one place. It will also help improve recruitment productivity where anyone familiar with the internet can use the system for easy application and immediate response (Scupola & Pullich, 2020).

2.4.8.7 Learning system

The learning system is a functionality of HRIS used in the administrative procedures for training management in the form of documentation, selections and tracking, reporting and also provision of reports that relate to training and learning of workers to the management for decision-making purposes (Shiri, 2012; Αυγητίδου, 2021).

2.4.8.8 Employee Self-Service (ESS)

Employee self-service is a functionality that allows the employees, in general, to access the HRIS by themselves without laying the burden on the HR personnel. The workers will have to log in with a unique password to make changes to some of their details and capture their leave, overtime, and other personal documentation in the HRIS. This functionality assists the workers to track down the process of their requests and documentation on the IS without interfering with the HRD (Muturi, Kiflemariam & Acosta, 2018:3).

2.4.8.9 Management Self-Service (MSS)

Management self-service is a functionality that allows the managers and the management, in general, to access the personal details through the ESS of their subordinates in the HRIS, where they can validate and approve the information captured by their subordinates in the ESS (Prasad, 2020:7). An HRIS with ESS would also have an MSS to allow proper HR control, approvals, and processes through the system. This assists in eliminating manual processes and excess burden on the HRD and the organisation in general on issues relating to HR processes.

2.4.8.10 Analytics

The analytics functionality of HRIS assists organisations to spread the values of their HRM usage and effectiveness through the extraction of all HR-linked data from the IS for strategic management decisions in terms of occupational intelligence and platforms (Simms, 2020). In this process, analytics assists organisations to synchronise HR standard measurements with other occupational data to ascertain any form of irregularities and tendencies in headcount to better forecast the impact of employee turnover rate in the future. Furthermore, Etukudo (2019) also indicated that analytics is an essential function in the HRIS that assists the HRM in successfully improving organisational performance by reducing workforce-related costs, improving the quality of workers recruited, talent management, employee engagement, etc. These strategic objectives using analytics are yet to be accomplished in most organisations.

2.4.8.11 Scheduling

Scheduling is a functionality of HRIS in the form of shift control management that deals with issues relating to timetable slots for work schedules. It is a form of time management used to create a work roster and timesheet that is needed to apportion who needs to work when they need to work, and the time required doing the work. (Shiri, 2012:832). This functionality can be relevant to organisations through HRIS. Treviño-Reyna et al. (2021) emphasised that most workers in organisations have their job descriptions defined. Still, work schedules are often not identified to assist in planning their work structures due to unsophisticated systems.

Barišić et al. (2019) believe that to measure organisational performance through HRISs, they need to have more functionalities and allow more people to have access. It would result in better productivity, innovation, service delivery and competitive advantage. However, their study supports Beulen (2009) by indicating that HRIS that could assist in achieving competitive

advantage should perform the following functions: i) corporate communication, ii) recruitment, iii) selection, iv) training, v) employee opinion survey, vi) compensation, vii) payroll services and viii) employment verification as well as ix) general information. The most significant cause of staff turnover is the growth of rival organisations, especially in emerging economies (Beulen, 2009; Iwu, Bayari & Jaiyeola, 2019). However, the development of rival competitors using HRIS as it affects the staff turnover rate will consequentially compromise the organisation's performance.

2.5   THE USE OF HRIS FOR COMPETITIVENESS

The survival and success of any organisation in this current globalised economy will be dependent on its competitiveness in the economy (Ukpere, 2007). It has become the norm to view and compare organisations with their fellow competitors in terms of products, services, workforce, skills, and ideas, to find out which is stronger in the sector (Vokić, 2015:3). HRIS is identified as one of the most critical factors in making HR-related decisions, and organisations are beginning to realise the effect of an HRIS that capture, analyse and report HR data that is critical in running the HRD as it relates to human capital (Das & Barman, 2018; Dery, Grant & Wiblen, 2007).

However, Ferdous, Chowdhury and Bhuiyan (2015) believe that a challenge associated with effective HRIS for competitive advantage is to meet workers' expectations despite the loss of personal interaction between HR, management, and the workers through the development of information culture; and also to elaborate a practical change management approach. Perhaps a further identification of the essential barriers affecting HRIS achievements is top management reluctance, employee privacy issues, internal organisational resistance to change, and conversion cost (Ferdous et al., 2015; Udekwe, 2016). These barriers need to be adequately engaged to develop a system for proper communication between the workers, HR, and management. Heikkilä (2013) states that HRIS is the automation of HRM systems through a web-based application to change the nature of interaction among HR workers, employees and management to move from a face-to-face to technology-based relationship.

Figure 2.3 shows the contribution of HRIS to organisational competitiveness. It starts with identifying the HR programmes required to operate the IS. Once the programmes are identified, it goes to the next stage of their impact on IT knowledge. To those that interact with the HRIS, it is essential to make sure that they are equipped and ready to take up the task of operation (Anupa, 2021:22). The implementation and use of HRIS are then initiated in a way that it will be effectively utilised. The advantages of implementing HRIS will be realised in

beating the competitors in terms of having the right people to do the job perfectly, accurately, and for competitive advantage (Simms, 2020:85). The roadmap of HR and IT towards achieving competitive goals is shown in Figure 2.3:

```
┌─────────────────────────┐
│      HR programmes      │
└─────────────────────────┘
            │
            ▼
┌─────────────────────────┐
│      IT-knowledge       │
└─────────────────────────┘
            │
            ▼
┌─────────────────────────┐
│          HRIS           │
└─────────────────────────┘
            │
            ▼
┌─────────────────────────┐
│     Organisational      │
│     competitiveness     │
└─────────────────────────┘
```
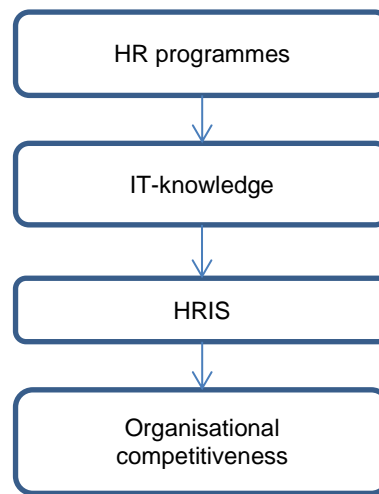
Figure 2.3: Roadmap to HRIS competitiveness
(WHO, 2013a)

HRM, as earlier discussed, consists of all the activities, policies, practices and procedures involved in acquiring, utilising, maintaining and retaining suitable skills combinations to achieve organisational competitiveness (Gordon, 2021). However, HRIS is the primary tool required to identify the gaps in the use of HRIS and its effectiveness in HRM. HRIS is a software package that will provide a comprehensive MIS for HRM activities in an organisation (Wairimu & Karanja, 2016:109). A broad and effective HRIS needs to be implemented to drive forward the organisation's vision, value and culture, which requires further study to identify what makes the implementation and use of HRIS in a competitive marketplace successful (Karpagambigai & Poornimarani, 2020:181).

2.6   OBSTACLES TO EFFECTIVE HRIS IMPLEMENTATION

Khan, Hussainy, Khan and Khan (2017:138) highlighted challenges in implementing HRIS and discovered that HRIS is widely used in most organisations with the main purpose of accessing employees' records, absence monitoring, performance appraisals, and the reduction of errors and paperwork. This is an indication that HRIS could help standardise the workforce IS in organisations, but lack of commitment by the middle and lower management is the most significant obstacle affecting the implementation due to fear of change (Matsiko, 2019; Menant, Gilibert & Sauvezon, 2021).

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Furthermore, Khan et al. (2017:138) observed that lack of absence management and performance appraisal were the most critical HRIS obstacles to implementing an effective system. However, lack of speedy response and access to personnel information was presumably felt to be some of the defects due to obstacles such as insufficient funds, lack of knowledge, less support of managers, lack of training and development and poor HRIS implementation (Dissanayake & Nandasena, 2019:68). Saif, Abd Rahman and Sidek (2022) also mentioned that poor sustainability, cultural, financial, and performance as the major challenges facing the implementation of HRIS and a need to maneuverer those challenges to augment the benefits of HRIS in organisations. As noted, middle and lower management's lack of commitment and involvement due to fear of changing the way they do things and not seeing HRIS as an advantage can limit the implementation of HRIS.

A study conducted by Dilu et al. (2017:1) on HRIS implementation and readiness in the public sector of countries like Ethiopia found that HRIS use can be unreliable due to poor relationships with information sources. Also, the enthusiasm for HRIS implementation was low, resulting in strategies targeted to improve the awareness and attitude of workforce skills to prevent the process from being untrustworthy and unreliable. Furthermore, Dilu et al. (2017:6) pointed out some of the obstacles that are hindering the HRIS implementation as: i) poor educational status, ii) lack of working experience, iii) unavailability of internet access, iv) unavailability of separate HR and IT departments, v) lack of personal computers, vi) poor computer knowledge, and vii) fear of losing their jobs. These obstacles are some of the HRIS implementation defects that must be researched for effective HRIS in organisations.

2.7   CHALLENGES FACED BY HRIS USAGE IN ORGANISATIONS

There are various challenges associated with using HRIS and the implementation thereof. Matimbwa and Masue (2019:132) identified some challenges related to HRIS implementation including infrastructural, skills, and organisational/managerial challenges:

- **Infrastructural challenges:** poor logistics/supply, lack of network/internet, low computer memory storage, lack of continuous data backup, non-antivirus usage, lack of office equipment, low availability of computer accessories, and frequent power interruptions/load shedding.

- **Skills challenges:** poor computer skills, lack of competent HR and IT employees (skills, knowledge, and attitude), lack of standard data handling skills, and poor ICT skills.

- **Organisational and managerial challenges:** lack of top management support, lack of teamwork within and outside the department, low stakeholder passion, low motivation to use IS, and poor attention to HRIS implementation and HR support process. These challenges are very critical and require further study to identify ways that HRIS can be used to transform the mindset of the workforce and organisations in general.

Alhazemi's (2017:143) critical analysis of the challenges facing HRIS adoption mentioned that the importance of HRIS is only realised when the acknowledgement of HR specialists aligns with that of IT. IS should be a part of HR functions mainly to develop better HR software, even though HRIS has been recognised as a significant development in HRM. However, Alhazemi's (2017) study proposed further research to identify numerous HRIS problems faced by organisations in countries like Saudi Arabia to find out if those problems are similar irrespective of the size and operation of the organisations compared with organisations in other countries.

Barman (2018) supports Alhazemi (2017) in identifying numerous challenges facing HRIS in integrating ICT in HR, as it affects human capital and competitive advantage. Barman's (2018) study further highlights how HRIS functions are intricate and challenging and run the risk of creating unreliable information for strategic decisions relating to human capital. There is therefore a need to conduct further studies to identify solutions regarding the intricate nature of the challenges that the HRIS is faced with producing reliable information.

Oyaro (2018:38) also noted the challenges of HRIS at a government establishment by indicating that HRIS helped improve the recruitment and selection process in terms of efficiency, effectiveness and cost but did not affect the salary adjustment and promotion decisions made by management. Perhaps this is partly why some researchers such as LI (2021) are recommending studies to gain deeper insight into the extent to which HRIS can assist in salary/promotions related decisions (Li, 2021).

Matimbwa and Masue (2019:132) identified three phases of HRM transitioning, which include: i) paper-based, ii) transition phase, and iii) web-based (HRIS). Practically, such a transition will require an effective ICT, and the ability of an organisation to procure such a technology is a great challenge that has to be investigated to identify ways that organisations can overcome such a challenge in the effectiveness of HRIS.

2.8   HRIS USAGE AND ORGANISATIONAL PERFORMANCE

Organisational performance could be regarded as part of why HR created a platform for the acquisition of IS. However, a study by Barišić et al. (2019:586) on the intensity of HRIS usage and organisational performance mentioned that the most substantial impact on organisational performance is achievable through the effective use of HRIS, which is measured by the availability of sufficient functions for access in the HRIS. This could also result from the overall development of the structural management system and its impact on organisational performance. Fundamentally, Laumer, Maier and Eckhardt (2014:3) emphasize that HRIS is essentially used for Business Process Management (BPM) growth in organisational performance and workforce metrics. Yet HR strategies for improvement, workforce planning and competency are still not achievable. Furthermore, Ali, Younas and Saeed (2016:3643) also believe that ICT plays a significant role in the effective management of organisational performance through HR practices, which could result in optimal performance if effectively utilised.

Barišić et al. (2019:588) identified 5 significant reasons which could motivate the use of HRIS for organisational performance: i) competitive growth through the improvement of HR practices, ii) expansion in the number and variation of HR operations, iii) shifting the focus of HR from transactional to strategic HRM, iv) giving all the employees access to HRIS, and v) restructuring the entire HR function. However, most researchers believe that HRIS is critical for any complicated organisation. Further, it is suggested that HRIS is considered to be a broad collaboration between humans, structures, strategies, processes and information but not illustrated solely as computerised HR-related platforms (Rahman, Islam & Qi, 2017; Were et al., 2019).

2.9   HRIS USAGE AS AN INVESTMENT

HRIS is an important investment for any organisation wishing to remain competitive (Masud & Islam, 2017). This all depends on the organisation and its policy regarding the acquisition of an HRIS. Iwu and Benedict's (2013:406) study on economic recession and investment in HRIS in SA found a reasonable level of trust and confidence in HRIS, and also, the continued use of HRIS was not considered a financial risk factor during the recession. However, the latter further proposed a long-term strategy as a way that organisations can achieve a competitive advantage and see HRIS as an investment rather than an operating cost.

In Khan, Hasan and Rubel's (2015:45) study on the factors that affect organisations' adoption of HRIS as an investment, they indicated that HRIS is expected to enable the efficient and

strategic direction of the HR workforce. Also, the system could provide a portal that allows the employees and management to modify data by creating automated reports. All this depends on the sophistication and simplicity of the IT infrastructure that runs the HRIS. Perhaps this could be categorised as an investment in HRIS. In this regard, some organisations consider investment in HRIS to be an expensive exercise (Huang, Gardner & Moayer, 2016:494).

In Ghana, where Ankrah and Sakro (2016:241) conducted a study on the intention and use of HRIS for investment among organisations, it was noted that ISs had assisted organisations in delivering state of the art HR services. Also, ISs helped reduce operational costs regardless of the size and operation of the organisation. That alone should be regarded as an investment because of the minimal expenses incurred. Ankrah and Sokro (2016) further highlighted that the improvement in HRIS did assist them in solving various HR barriers relating to attracting, retaining, motivating employees, meeting the demands for more strategic HR and also managing the human element of technological transformation. These achievements concerning effective HRIS positively impact organisational performance, which can be translated into investment in an organisation if properly addressed.

According to Warui, Mukulu and Karanja (2015:46), with regard to the influence of management participation and investment on HRIS in government departments, HRIS impacts on policies and practices that influence workforce behaviour, attitude and performance. However, in most cases, HRIS is still a transactional process, whereby an investment might render the wrong impression on the organisation's financial report and the public in general. The latter further emphasises that HR is a support function that requires IS to provide quality service that supports and promotes organisational development, but not to view the system as an investment.

A study conducted by Quaosar (2018:135) observed an inadequate understanding of the effective use of HRIS as an investment and identified the factors that create a negative impression of HRIS not being adopted as an investment, using the Unified Theory of Acceptance and Use of Technology (UTAUT) model. The UTAUT model identifies factors such as: i) performance expectancy, ii) effort expectancy, iii) social influence, and iv) facilitating conditions. Quaosar's (2018) study concludes that these factors substantially impact HRIS adoption as an investment. However, there is a lack of research on HRIS regarded as an investment. Still, the fact is that employees involved in IS development are lacking, and there is a need to ensure that both system usage and employee satisfaction can be engaged in denoting HRIS as an investment.

2.10 LIMITATIONS OF HRIS

Numerous studies have identified the challenges and limitations of HRIS in various organisations (Šušnjar et al., 2013; Masud & Islam, 2017; Maamari & Osta, 2021). Jahan (2014:35) identified the limitations of HRIS as follows: i) it can be costly in terms of funding and human resources, ii) it can be intimidating and complicated, iii) In-depth understanding of what constitutes quality information for the user might be lacking, iv) computers cannot substitute for human beings, v) irregularity in the reputation attributed to HRIS can result in troubles in sustaining management commitment to the project and in obtaining the resources necessary to develop the new or advanced HRIS, vi) a propensity to undervalue the difficulty of the HRIS and its impact on the performance and practices of the organisation, and vii) blocks to user recognition of the HRIS and the resultant underestimation of the reputation of change management. For successful HRIS implementation, these encounters and limitations must be adequately communicated with organisations. Maduagwu and Ugwu (2018) also believe that HRIS contributes to enhanced productivity whereby employees in the HR and ICT units should be trained regularly to be acquainted with the relevant information and skills to perform the HR functions and overcome such limitations.

2.11 CHAPTER SUMMARY

This chapter presented the transition of HRM, E-HRM, and HRIS in the context of their effect on organisations. The introduction, definition, functions, challenges, limitations, functionalities, and motivating reasons for using HRIS were discussed. A literature review was used to support the discussions.

Human Resources (HR) benefits from Human Resource Management (HRM), a strategic, integrated, and coherent approach to the employment, development, and well-being of the people working in organisations. Without HRM, HR cannot be effective. The functions were also identified: job design and analysis, human resource planning, recruitment selection orientation, performance management, training and development, reward management, health and safety management, discipline management, and employee relations. The challenges were also identified: no global HR policies and development plans, lack of coordination and poor decision-making. HR record-keeping was manually done and was also operated in isolation. These challenges were the reasons for the non-improvement of workforce management that led to the introduction of HRIS.

E-HRM was also highlighted in this chapter which involves the application of IT and network support of two or more individuals or collective actors in their shared performance of HRM

activities. This consists of HRM automation where people can operate the HR functions through a computer and IS. The types of E-HRM were discussed in detail. The combination of HRM and IS does have an impact on the performance of human management in organisations. The factors that can cause poor E-HRM were mentioned. The need to have an effective system to support HR was also emphasised.

HRIS was introduced as a systematic procedure for maintaining, collecting, storing, retrieving, and validating their HR, personnel activities and organisational characteristics when needed by an organisation. This chapter also focused on HRIS and its effect on various organisations. The types of HRIS software and functionalities were explained in detail. The functions, advantages and disadvantages were also mentioned in this chapter to give a clear view of HRIS. HRIS limitations were also identified, as well as the reasons why the limitations are regarded as human error, which is part of the major problem faced by HRIS. Also, numerous challenges identified by researchers were highlighted in this chapter. This chapter also presented why organisations need to focus on efficient HRIS and the issues that need to be dealt with for effective use.

The next chapter continues the literature review and will focus on the state of healthcare in SA.

CHAPTER THREE: THE STATE OF THE HEALTH SECTOR IN SOUTH AFRICA

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Figure 3.1: Layout of Chapter 3

3.1   INTRODUCTION

Developed countries are attracting physicians and other health professionals from third world regions such as Africa. As a consequence, third world regions such as Africa are left vulnerable to health challenges (Saluja et al., 2020:1). The high rate of turnover of the health workforce in Africa has created a vacuum that is difficult to fill. Africa is the most affected continent in the health workforce shortage due to several reasons such as early retirement, resignation, and death (Chankova, Muchiri & Kombe, 2009:1). These skill shortages are aggravated by the lack of quality IS, giving the authorities unreliable information to make quality decisions.

Interestingly, healthcare frameworks and models in SA manifest many years of historical development. However, the healthcare system of the National Department of Health, SA (NDHSA) is not isolated and static, as a result of the constant evolution of problems in the political system (Katuu, 2015). Changes need to be made in the SA healthcare system keeping the internal processes in mind and understanding that speedy transformation in the sector will not be easily achieved without effective IS in place. Perhaps the lack of effective IS as one of the main reasons for the lack of transformation in the health sector (Katuu, 2018).

3.2   A DESCRIPTION OF SOUTH AFRICAS PUBLIC HEALTH SECTOR

SA's public healthcare sector is inadvertently linked to the history of transformation in the country. Using the history of SA as a basis for the explanation of progress in the health sector, Van Rensburg and Harrison (1995) identified six different stages linked to the healthcare policy and legislation in the country. Table 3.1 highlights a brief history of the stages of South Africa's public health sector.

Table 3.1: Stages of South African public health sector setting through legislation
(Van Rensburg & Harrison, 1995; Katuu, 2018)

S/NO	Period	Description
1	The period before 1919	The first healthcare legislation was publicised for a workers' union in SA
2	The period from 1919 to 1940	The overview of the first healthcare legislation that had nationwide control in SA
3	The period from 1940 to 1950	A stage that was categorised by tolerant and progressive events within the healthcare sector
4	The period from 1950 to 1990	The stage when apartheid was paramount in the country

S/NO	Period	Description		
5	The period from 1990 to 1993	The stage of transition from apartheid to democratic dispensation led to the first democratic election		
6	The period after 1994 to date	i.	The period from 1994 to 2003	Concluding in the endorsement of the National Health Act 61 of 2003 (NDHSA, 2003)
		ii.	The period from 2003 to date	The new democratic constitution has established an absolute right to health for all South Africans, irrespective of race. Children also have the right to essential nutrition, shelter, and social services (Giaimo, 2016; Rispel et al., 2019; Tiwari et al., 2021a)

Fundamentally, SA's constitution states that the national and provincial governments have the simultaneous legislative authority to provide healthcare services to the public (RSA, 1996). However, the National Health Act (NHA) was promulgated in 2003. It was mainly focused on assessing constitutional human rights which provides a structured framework for the healthcare system within the country. This considers the laws and regulations imposed by the legislation on national, provincial and local governments on issues relating to healthcare systems (NDHSA, 2003).

3.2.1 The context of the public health services in South Africa

3.2.1.1 The national, provincial and district health sectors in South Africa

The delivery, physical state, and poor design of facilities in the public health sector, which serves most of the country's population in the new dispensation, have been considered inadequate. This inadequacy resulted from a lack of provision and poor delivery of health services by the nine provinces of SA (Katuu, 2019). However, they had to follow the health policy guidelines adopted by the NDHSA which might not be appropriate for the sustenance of the healthcare workforce and services in the country (NDHSA, 2010). SA currently comprises 9 provinces (Figure 3.2), consisting of 44 district municipalities, and 226 local and 8 metropolitan municipalities (RSA, 2021).
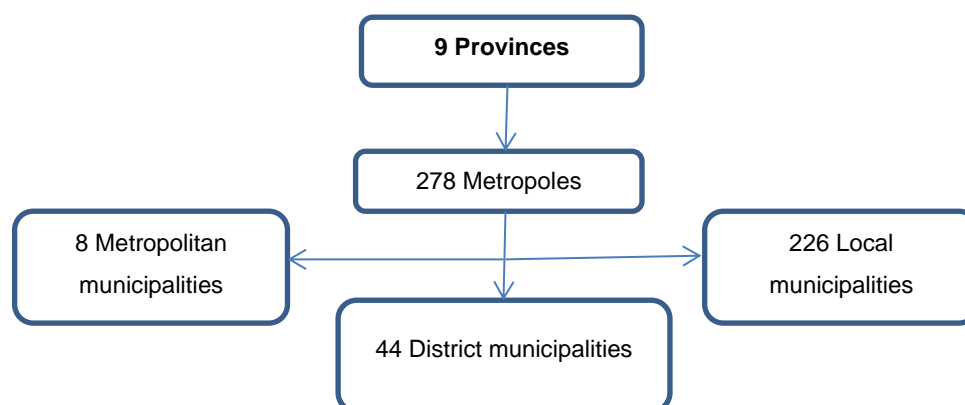
Figure 3.2: The Provinces, Metropoles and Municipalities in South Africa
(RSA, 2021:4)

The major contemporary public health sector in SA is made up of; one (1) National Health Sector (NHS), nine (9) Provincial Health Sector (PHS), and fifty-two (52) District Health Sector (DHS) (Rapakwana, 2004:15). However, the National Department of Health complements all the phases of public and private healthcare delivery services at the 3 current levels to ensure that the sector is adequately controlled by the appropriate authorities (Van Rensburg & Pelser, 2004). However, for these public health sectors to function simultaneously, the administrative, financial, planning, HR and support functions are conveyed through a comprehensive agreement between the Provincial, District and Municipal offices (Geyer, Mogotlane & Young, 2009). Essentially, the health sector of SA is divided into public and private sectors, with a total of 4380 public health facilities and 216 private health facilities located in SA. Table 3.2 indicates the make-up of the health facilities in SA.

Table 3.2: List of categories of public healthcare facilities/hospitals as compared to private health facilities/hospitals in South Africa
(Gray, Riddin & Jugathpal, 2016:36)

No	Public health Sector	No	Private health Sector
16	Tertiary Hospitals	216	Private Healthcare Facilities / Hospitals
698	Specialist Hospitals		
55	Regional Hospitals		
254	District Hospitals		
282	Community Health Centre's		
3075	Primary Healthcare Clinics		
4380		216	

However, a report on national health service delivery by the National Department of Health of SA (2010:5) noted that as of the year 2010, a doctor in a public health facility sees on average about 4200 patients. In comparison, a doctor in a private health facility only sees about 243 patients monthly on average. Rispel and Padarath (2018:15) believe that in SA, there is a lack of accurate information on the mal-distribution of healthcare personnel between urban and rural areas, between private and public sectors and between the provinces. The latter further highlighted that 56% of the general practitioners and 73% of nurses' work in the public health sector in SA. Even though these statistics are clear, the private health sector controls more funds than the public health sector, which is why their workers earn much more than their counterparts in the public health sector. This vast disparity in salaries does affect the retention, motivation, and sustainability of workers in the public health sector.

There is a significant imbalance in the inequitable distribution of health workers in SA and beyond. Chukwu (2017:8) notes a critical health workforce shortage in 57 countries globally (including SA). This accounts for a global deficit of 2.4 million doctors, nurses, and midwives. The data also suggest that millions of people worldwide do not get the needed healthcare services due to the unequal distribution of the skilled workforce.

3.2.1.2 Challenges faced by public healthcare in South Africa

The public healthcare system in SA is facing numerous challenges such as: i) insufficient HR personnel, ii) inadequate budgetary allocation to healthcare, and iii) poor governance and management (Oleribe et al., 2019:395). However, Oleribe et al. (2019) further mentioned that to counteract these challenges, the health system needs to have the following in its domain: i) training and capacity building for the health workforce, ii) increased budgetary allocation to health, and iii) advocacy for political backing. Perhaps there is an indication that the weak healthcare systems in Africa needed drastic solutions with innovative thinking to break the current bottleneck in service delivery.

Essentially, the government has poorly managed its resources because it concentrated on transforming the country from the apartheid era instead of providing adequate health services (Dambisya, 2007:25). However, this transformation process led to the identification of 3 significant challenges facing the health sector, namely: i) inequality, ii) disjuncture, and iii) nepotism (Humayon et al., 2018). Perhaps such challenges affect the health sector more concerning the benefits rather than the preventative part of the services rendered to the public (NDHSA, 2010; Hlayisi, 2019). The 3 significant challenges are itemised:

3.2.1.2.1   Inequality in the healthcare

Inequality: Pre-1990, the health system was categorised by the National Government of SA into 14 different operating health authorities, of which 10 serviced remote areas, and the other four of the system serviced the urban areas (Barron & Padarath, 2017). The 10 health systems in the remote areas were in self-governing districts, with most of the population living in the less privileged communities. However, currently, inequality still exists between the urban and rural health services where the urban areas are benefitting in terms of better health services and more secure working environments than the rural areas (Gray, Riddin & Jugathpal, 2016; Malakoane, Heunis, Chikobvu, Kigozi & Kruger, 2020).

3.2.1.2.2   Disjuncture in the healthcare

Disjuncture: There is a disjuncture between the private and public health sectors in SA. Schneider, Barren and Fonn (2007:290) made it known that the "public health sector of SA has an inexplicably lower financial and other related support in terms of patients and workforce and within its healthcare operation than the private health sector. This has created a deterrent for the public healthcare system". Years into the South African democracy, there is still a big difference in healthcare delivery between the highly sophisticated private health sector and the public health sector. The public sector is still struggling to address the health needs of the poor community, which makes up the majority of the country's population (Thiede & Mutyambizi, 2010; Moshidi, Malema, Rambelani Muthelo & Mothiba, 2021). Private healthcare continues to improve and get wealthier. In contrast, public healthcare deteriorates due to the lack of necessary human and financial resources to provide good quality healthcare to most of the population (Shipalana, 2019). It is mainly the deterioration of HR that has become a challenge.

3.2.1.2.3   Nepotism in the healthcare

Nepotism in terms of healthcare service provision arrangements, which also refers to the doctor-reliant healthcare services, is concerned with subjective beneficial services rather than preventative healthcare services. These services include the provision of medical, sanitation, water, and education, amongst others (Cullinan, 2006:3). Cullinan emphasises that this provision arrangement goes as far back as the 1900s when the responsibility to provide public health services was earmarked in one function of the National Health Department (NHD). In contrast, the local authorities answerable for environmental and preventative healthcare services reported to a different healthcare sector in the same NHD (Cullinan, 2006). This was a way of separating the services according to race in the same NHD (Maharaj, 2007; Katuu, 2018). By 1940, efforts were made to introduce community health centres that were combined with education and the promotion of healthcare services as essential elements of the

healthcare delivery services, thereby integrating health services and preventative healthcare services in a widespread community healthcare platform (Van Rensburg & Harrison, 1995; Katuu, 2018). Unfortunately, after 1940, conservative and deep-rooted necessities of the medical establishment opposed the integrated approach, and it was eventually rejected in 1960 (Ijumba & Barron, 2005). The unfairness of government support towards the public healthcare services was carried on in the entire period from early 1900 to pre-1990, and the private sector was more favoured than the public sector.

Fundamentally, nurses dominate the healthcare workforce in SA, especially in rural areas where most physicians are unwilling to practice. In a study conducted by Ngobeni et al. (2020:2), nurses account for 143,264 or 63% of public health personnel. Then, the medical doctors, specialists, and researchers are 19,988 or 9% of the total public health personnel, yet 70% of the country's entire workforce is private. Even at that, 30% of doctors have migrated, and 58% intend to migrate to HICs (Ngobeni et al., 2020:2). This movement of workers is regarded as a "big loss on investment" for the South African economy and a shortage in the public health sector services (Mwanza, Stassen, Pigoga & Wallis, 2020). Therefore, the brain drain is extremely damaging and strains the HR function in the public health system domain.

The unfairness of government support towards public healthcare negatively impacts the fact that most skilled health workers are more concentrated in the urban areas and the private sector (De Haan, Dennhill & Vasuthevan, 2005; Tiwari et al., 2021b). Perhaps this has become a challenge in the public health sector and in addressing the challenge, the South African government introduced National Health Insurance (NHI) which began in 2012 and will be fully implemented by the year 2025 (Blecheri et al., 2019). However, the main focus of the NHI plan was to bring the service delivery resources of both the private and public health sectors through a support structure to create innovative awareness, training and financial support for sustainable health services in the country generally (Maphumulo & Bhengu, 2019:5). Practically, there is still a disparity in workforce retention and management between the public and private health sectors.

3.2.2 The human resource perspective of job satisfaction in the public health sector in South Africa

3.2.2.1 Job satisfaction in the public healthcare sector

Numerous studies have been conducted concerning job satisfaction among those in healthcare. Yet, there has been no conclusive reason why there is a high level of work dissatisfaction in the public health sector coupled with the reduction in the number of the

workforce (Otieno, Kowa, Wakibi & Kassim, 2019:309). However, Bhandari, Bagga and Nandan (2010:403) conducted a study on the levels of job satisfaction among healthcare providers and mention that the availability of labour in the healthcare sector was diminishing, and the quality of service rendered to the public is directly linked to the skills, motivation and satisfaction of the health workforce. Also, Boone (2021:3) identified lack of job satisfaction as the primary reason people resign from the public health sector to work overseas. Recent studies have shown lower job satisfaction in the health workforce during the COVID-19 pandemic. This situation has affected working relationships and compromised the quality of healthcare services in the country (Reddy et al., 2021).

Luddy (2005), Edwards (2021) and Bhandari et al. (2010) found that a lack of job satisfaction in the health sector has caused a reduction in the number of health workers in SA. Perhaps the migration of skilled health workers and lack of equitable resources have intensified the current problems impeding the effectiveness and efficiency of service delivery in the health sector. However, Anabui et al. (2021:2) found that employees in the public health sector of SA expressed satisfaction with their colleagues, the nature of the work and the supervision they received, but the dissatisfaction came from: i) lack of promotion, ii) poor working conditions, iii) staff shortages, and iv) below competitive salaries, which is an indication that further study needs to be conducted to identify ways to curb the problem of dissatisfaction among health workers.

3.2.2.2 *Job satisfaction and retention in the health sector*

Job satisfaction and retention in healthcare are anticipated to be a reason for the effectiveness in the health sector. In Richard's (2019) study on the relationship between job satisfaction and retention of nurses in health facilities, an indication is made that the nursing profession was facing numerous challenges regarding retaining qualified members. That is due to a lack of commitment towards nurses and a lack of proper expansion of the current enrolment of nurses to meet community needs. Richard (2019) further identified the numerous challenges that relate to the dissatisfaction of nurses as: i) increase in the retirement age of nurses, ii) they were underpaid when compared to other minor clinical service providers, iii) they faced challenges trying to balance life and higher workload, and iv) the absence of mentorship in the nursing field. Essentially, there is a need to conduct a study to identify the relationship between job satisfaction and the intention of workers to remain at work in the field and the need to have mentorship to build up the morale of the workers (Zapata et al., 2021:S80).

According to Iwu (2014:198), some factors that can influence job satisfaction and retention of skilled health workforce include: i) work strategy, ii) justifiable performance management, iii)

unified control and information sharing, iv) self-efficiency, v) intimate and responsive work surroundings, vi) innovation, and vii) exceptional client familiarity and expertise (Iwu, 2014). However, for adequate job satisfaction in the health workforce, these factors need to be considered to improve job satisfaction and retention in the South African public health sector.

Interestingly, Iwu et al., (2012) mentioned the fact that employee satisfaction in the health sector of SA is highly centred on the medical doctors and nurses, without considering the other skilled health professionals like pharmacists, paramedics and laboratory technicians, amongst others. Perhaps this situation has created a lack of an effective model for measuring health workforce dissatisfaction across the board, and there is a need to consider introducing other measures that will assist in the retention of workers in health (Iwu et al., 2012; Udekwe, Iwu, de la Harpe, & Daramola. 2021a; Hassan, Alam, Campbell, Bowyer, & Reaz, 2022).

3.2.2.3 *Job satisfaction and occupational stress in the health sector*

Wushe and Shenje (2019:1) highlighted the relationship between occupational stress and job performance in public health institutions. They pointed out that occupational stress has become a problem for organisations. Job satisfaction is supposedly higher in other sectors compared to the level of stress at work in the health sector. However, harmful physiological and psychological factors possibly affect the management of the workforce. Also, Lahana et al. (2017:6) discovered that skilled health workers such as doctors, nurses, midwives and laboratory technicians have become more likely to have too great a workload and unfavourable working hours as they keep up with the increasing demand for healthcare due to the shortage of staff. Consequently, many healthcare workers have developed stress conditions due to the more significant workload and facing irreconcilable demands for services and finding less support from their managers, which ultimately causes stress and job dissatisfaction in the health sector.

Work-related stress conditions are also known as occupational stress (Wushe & Shenje, 2019:2). They are described by Wushe and Shenje (2019:2) as "various types of both physiological and psychological burdens that are felt and handled by employees at the workplace". Occupational stress is currently an emotional issue in most organisations due to its propensity to contribute towards workforce incompetence, absenteeism, turnover intentions, and minimised job satisfaction. Roy, Weyman, George and Hudson-Sharp (2017:2) identify an undesirable relationship between work overload and job satisfaction, which requires further study to create a conducive working environment with less of a workload and better job satisfaction among the health workers.

Occupational stress and mental health are sometimes related when dealing with work-related issues. Gray (2019:21) highlighted that most healthcare employees experience a high rate of mental health disorders such as fatigue, anxiety, bipolar illness, and unhappiness due to poor working conditions, extreme workloads, violence, and victimisation in the healthcare environment. Also, Kumar et al. (2021:7) believe that mental problems affect both workers and patients as services the workers render to the public are diminished. However, Gray (2019:21) proposes a further study that needs to be conducted on the growing consciousness of mental health concerns to improve the mental health situation of the workforce in the healthcare sector.

Mental health disorder is a general problem in the health sector countrywide. A recent example of stress and mental disorder in the health sector was noted in July 2018, when a prominent South African cardiologist from the University of Cape Town (UCT) committed suicide allegedly due to depression at the workplace (Nyathi, 2018). Perhaps this stress situation has weakened the country and prompted the health sector to pay urgent attention to stress and mental health in the workplace in SA (Okolo & Iruo, 2021:852). However, the problem in the industry is still on an upward rise which requires further study to identify an IS that will assist to remedy the situation.

3.3   HR PRACTICES IN THE HEALTHCARE SECTOR IN SOUTH AFRICA

HR practices are a process in which workers in an organisation understand themselves to be in a fair and justifiable situation that meets their needs. However, it also interprets the pressure of constraining the performance of organisations (Rosdi & Harris, 2011:1156). Essentially, HR practices are regarded as the best and most modern way of managing an organisation's employees successfully and enhancing leadership styles, which would encourage retention in the end. Coincidentally, a study conducted by Almaaitah, Harada, Sakdan and Almaaitah (2017:16) focused on theories to support HR practices, leadership style and employee retention in the health sector. The study found that the world had witnessed a paradigm shift from HRM to human capital development (HCD). Therefore, to highlight the importance of this occurrence in the health sector, numerous studies have been conducted concerning HR practices in the health sector. The focus is on organisational commitment and performance achievement. Furthermore, there is a need to conduct a further study to identify well-nurtured HR practices that can be merged with an efficient leadership style to reduce the attrition rate and better work performance in the health sector as speculated study.

3.3.1 HR practices in facilitating an employee-driven innovative health workforce

HR practices that enable an employee-driven innovative health workforce to determine how HR practices, performance appraisals, training, teamwork, and job rotation can be applied to maintain the skilled health workforce. This is also done to enhance their ambitious, innovative performances (Dijkstra, Bos-Nehles, Meijerink & Renkema, 2016:1). Ideally, as Dijkstra et al. (2016:6) observed, HR practices interact with employee-driven innovation in such a way that nurses are goal setters, also benefit from job rotation and would also prefer tangible incentives. At the same time, doctors are more focused on gaining speciality through meetings and are believed to be superior to nurses. However, this situation does not guarantee that doctors are more likely to remain at work than nurses.

Interestingly, Geng and Hu (2019:1) highlighted that the number of Health personnel that meet the required skills to promote innovative growth in the health sector would require the combination of the entire skilled health workforce to achieve an equitable employee-driven creative workforce in the sector.

3.3.2 Factors affecting the HR problem in the public health sector in South Africa

There are numerous reasons for reducing the number of health workers in SA. However, in a study conducted by Saho, Sarr and Tunkara-bah (2019:1) on the factors that influence the reduction of skilled workers, they identified HR as the foundation of the health sector and the criterion for improving the sector. Perhaps with the increase in migration from the sector, there is a need to identify an IS that will assist HR to curb the problem of reduction in the workforce. However, the high rate of the resignation of skilled health workers in African countries such as SA has a crisis in the Human Resources for Health (HRH) in countries like SA (Rispel, Blaauw, Ditlopo & White, 2018:14).

Many health workers resign and leave, taking their skills and qualification with them while the country faces a considerable workforce reduction problem (Grossman, 2004; Sobers, 2020). For this reason, there has to be an intervention by the government in finding different ways to improve the working conditions of workers to discourage resignation in the health sector and reduce the level of migration. In a study conducted by Saho et al. (2019:20), 24% of the participants had already left the health sector, while 67% considered leaving the sector. They further mentioned that the reason for people leaving is because the health sector is unable to meet the basic human needs of the workers because of i) low prospect for promotion, ii) management and financial problems, iii) lack of self-esteem, iv) limited self-actualisation and v) low sense of love and belonging. These factors are part of why there are reductions in the number of workers in SA.

However, Oliver and Care's (2019:2) study highlighted that the global health workforce shortage is challenged by changes in demographics such as the ageing population and a high burden of chronic diseases. Although there has been considerable progress in reducing death arising from morbidities and extending life expectancy worldwide, there is still a growing rate of non-terminal infections and an increasing number of years lived with infirmity. Oliver and Care (2019:16) further suggested the following points to consider as solutions to the health worker shortage: skilled communication, true collaboration, effective decision-making, appropriate staffing, meaningful recognition and authentic leadership.

Owens (2019:125) mentioned that regarding the shortage of health workers in the African continent, approximately one million registered nurses born to the baby boomer generation were projected to retire by 2025. This massive reduction in nurses is already hurting the quality of services and has drawn substantial attention to the continent. However, Mustikaningsih, Setiawati and Fitri (2021:764) are also of the opinion that the reduction of nurses has created a vast interest in the nursing profession, although the employment opportunities are limited due to the poor quality of nurses in circulation. Therefore, this calls for a need to assess the quality and knowledge of the newly trained nurses and the need for guidelines in scrutinising the upcoming nurses to ensure that they are well trained and equipped to take the nursing profession to greater heights. Furthermore, there is a need to conduct a study to identify what impact safe and effective healthcare has on service delivery and what challenges the health sector faces regarding the present high rate of ageing nurses in the health sector.

3.4   THE BRAIN DRAIN IN THE PUBLIC HEALTH SECTOR IN SOUTH AFRICA

The brain drain has been identified as one of the most significant factors depriving the health sector of adequate performance on the African continent; various research has been conducted concerning skilled and unskilled health workforce migrating from the health sector to other sectors (Okolo & Iruo, 2021:842). This is not only happening in SA but the entire African continent. Africans are migrating to Europe and other developed countries, searching for a better life and job satisfaction in the health sector. Yet, there has been no solution identified to deal with Africa's health sector migration problems (Mofolo, Heunis & Kigoz, 2019:4). Besides, Berzenn (2018:17) conducted a study on the life experiences of registered nurses seeking to migrate overseas from Africa and found that countries with poor healthcare facilities are losing their health workers through migration to the west in search of better jobs opportunities. One of the reasons for this migratory trend is the desire of the migrants to give back to their families. Due to poor economic conditions in the migrants'

countries and the offer of better remuneration and improved working conditions in the West, such migratory trends will continue unless governments in Africa make drastic changes in policies and working conditions (Crush & Williams, 2010; Berzenn, 2018).

Mateus, Allen-Ile and Iwu (2014:63) assert in their study of the skills shortage in SA and the effect of brain drain, the problem is not exclusively tied to the government. There is a need for an upgrade in skills development and to respond to the brain drain with a long-term strategy to identify skills shortages. Such strategies will include effective performance management, integrity, and innovation in the SA health sector (Iwu, 2014).

3.4.1   Brain drain and migration of South African medical professionals

The brain drain is regarded as a serious problem for the health sector of countries such as SA. In a study conducted by Crush, Chikanda, Bourgeault, Labonté and Murphy (2014:1) on the emigration of SA medical professionals, it was highlighted that after 1994, SA experienced substantial drainage of health professionals that led to a significant drop in the quality of healthcare in the country. The costs associated with skilled health migration from SA are usually termed "lost investment in training" (Saluja et al., 2020:5), and the departure of these skilled personnel has left a big vacuum in the medical field of SA to this day.

Interestingly, Crush (2019:2) mentioned that from 2007 to 2013, "the loss in investment in training" that SA has incurred from the departure of health specialists to Australia, Canada, the USA and the UK amounts to USD1.4 billion and that showed a high level of dissatisfaction among health specialists concerning their work and living conditions in SA. Consequently, this indicates that the country has lost many trained and skilled health workers who are not ready to serve their country for personal reasons. However, Preko, Boateng and Effah (2019:1) believe that assessments need to be made to determine whether the skilled approaches and sensitivities have changed from 2014 to date. Ideally, the reasons for such assessments are: i) whether levels of contentment with work and life in SA have improved or deteriorated, ii) whether potential migration has worsened or deepened amongst health specialists, iii) whether the loss of intellectual capital to SA healthcare is likely to continue, and iv) whether there is an effective IS in place to monitor and manage the health workforce in the country (Crush et al., 2014:1).

3.4.2   Loss on investment through workforce emigration in South Africa

There is a high level of health workforce emigration from Africa to other continents, which has created an enormous vacuum and caused lost investment in most countries such as SA

(Mwanza et al., 2020). Tupá and Krajčo's (2019:262) study on the migration of physicians from Africa to Europe with a glance at the labour market's position in the health sector, a reduction in the number of physicians was identified. However, the future needs of the continent were identified, and solutions using the push/pull factor theory are frequently used to determine the health workforce migration position by most researchers (Thomas, Fleming, O'Donoghue & Almirall-Sanchez, 2021:4). Tupá and Krajčo (2019) also realised that there is little incentive for physicians to stay in the country after they graduate. Essentially, they highlight the need for foreign medical practitioners to make up the vacant spaces in the health sector, suggesting that there must be changes in the health system to recognise and keep records of qualified medical practitioners from both home and abroad (Tupá & Krajčo, 2019). Furthermore, there is a need to introduce a scarce skills employment development programme (SSEDP) and a specialised education programme (SEP) that will summarise and suggest solutions to the problem of migration in the health sector in Africa.

The migration of physicians from low to high-income countries affects human capital and increases the mortality rate in low-income countries. Saluja et al. (2020:1) revealed that lower and medium income countries (LMIC) lose about US$15.86 billion, a substantial amount of their budget annually due to the migration of physicians to HIC. Saluja et al. (2020) identified countries most affected in terms of costs and human capital, including India, Nigeria, Pakistan and SA. This calls for international and domestic policies to be implemented to address these issues and the need to introduce IS that can be used to monitor why people are migrating from the LMICs to find an avenue to motivate them to stay.

Nwadiuko, Switzer, Stern, Day and Paina (2021:1) conducted a study on South African physician emigration between 1991–2017 and found that migration of health workers was a result of poor documentation, lack of economic growth, political instability and related policies that affect the migration of workers. They propose that health workforce policy intervention is needed, and a migration monitoring process needs to be incorporated into the health workforce planning structure to solve the problem of loss of investment.

3.4.3   The push/pull theory on the brain drain in South Africa

George, Blaauw, Thompson and Green-Thompson (2019:6), in a study on the maldistribution and brain drain of the health workforce in SA, proposed the push and pull factor to identify reasons why people leave the country to work in other developed countries for push factor reasons such as: i) low remuneration and work-related risks such as diseases and virus infections such as HIV/AIDS, TB, Ebola, Lassa fever and Covid-19 just amongst others, ii) insufficient HR planning with excess workloads, and iii) poor infrastructure and inappropriate

working environments. The pull factors would be a better working environment and culture, better salaries and other benefits, better education well-being of the family to name a few George et al. (2019) further emphasised the use of push/pull factor theory and identified the factors in Table 3.3:

Table 3.3: The push and pull factor theory
(George et al., 2019:6)

Factors	Reasons
Push factor	Political uncertainty, crime rates, taxation issues, suppressive political and environmental issues, and tumbling service values.
Pull factor	Aggressive recruitment by receiving countries, improved quality of life, study and specialisation prospects and enhanced remuneration.

Mlambo and Adetiba (2017:62) support Padarath et al. (2003) in their study on the effects of the brain drain in the SA health sector, using a similar push/pull theory, and noted that studies have been conducted to address the issue of health workforce migration in SA. However, many such studies are yet to unpack the effects of the brain drain in the country. However, the effective functioning of any health sector in a country will be dependent on the availability of skilled health professionals in that country. Furthermore, Mlambo and Adetiba (2017:62) made a further determining suggestion that for such migration problem to be resolved in the health sector, there should be: i) improvement in the working conditions and security, ii) upgrade of infrastructure and ensure the availability of resources, iii) develop a more open immigration policy prioritising skilled health immigration, and iv) introduce an effective IS to identify the HR-related issues that need to be addressed in the health sector.

3.4.4   Action plan to prevent the brain drain in the healthcare system of South Africa

Various organisations like the World Health Organisation (WHO) and United Nations (UN) have had several action plans to avoid the high rate of brain drain in the health sector in Africa, yet no tangible solutions have been identified to that effect. However, a study conducted by Grossman (2004:17) on the action plan to prevent the brain drain in the healthcare system realised that sub-Saharan African countries such as SA have been threatened with a drastic shortage of health workforce after they are trained. The WHO recommends the required number of health workforce available in a particular country. According to the latest obtainable data, 36 of roughly 57 nations in sub-Saharan Africa, including SA, do not meet the WHO recommended minimum health workforce requirement (Oleribe et al., 2019:400). Table 3.4

indicates the WHO recommended minimum health workforce in Sub-Sahara Africa by WHO (2018a).

Table 3.4: WHO recommended minimum health workforce expected in Sub-Sahara, Africa

(WHO, 2018a:3)

Occupation	Health workforce available in Sub-Sahara
Nurses	17 sub-Saharan African countries have 50 or fewer nurses per 100,000 people and do not meet the WHO recommended minimum of 100 nurses per 100,000 people.
Doctors	13 sub-Saharan African countries have 5 or fewer doctors per 100,000 people and do not meet the WHO recommended minimum of 20 doctors per 100,000 people.

The statistics mentioned in Table 3.4 may diminish the extent of the shortage of doctors and nurses in sub-Saharan Africa. The HIV/AIDS and COVID-19 crisis has expanded the need for health specialists. The burden on the previously stressed health sector continues to grow as patients with COVID-19 and related illnesses have overcrowded the hospitals (Ghanbari et al., 2020:E508).

In Ghana, for instance, as of 2005, it was estimated that 43,000 health workers were considered quite inadequate to meet the healthcare delivery service for a population of 20 million people (Nyonator & Dovlo, 2005:227). Ntsala and Dikotla (2019:622) also mention that most countries in Africa had signed agreements with the Cuban government to recruit their doctors. Ghana has already employed over 200 Cuban doctors for a two-year contract to work in the rural areas. Also, they have increased the salaries of their nurses to high regional standards. Ntsala and Dikotla (2019:622) also assert that the Senegalese government is currently developing policies to motivate and encourage their local health specialists not to migrate to other countries. The SA government has introduced a rural allowance since 2004 to promote retention in such areas (Ntsala & Dikotla, 2019). However, despite all these adjustments in the African health sector, there is still dissatisfaction in the sector in Africa which requires further study to identify other ways to retain health workers.

Currently, the effect of the brain drain has reduced the number of health workers as the population increases at a fast rate, creating an inequitable treatment that restricts access to better services for the population in Africa (Okolo & Iruo, 2021:842). For example, Mulievi and Juma's (2019:937) study indicated that as of 2013, WHO identified Kenya as one of the worst

countries in Africa affected by the skills shortage. They have a severe health workforce shortage of 13 health workers per 10,000 patients. This is less than the minimum required standard of 23 health workers per 10,000 patients (WHO, 2013b). This also signifies that Africa has the highest rate of health workforce drainage and that alone has a negative impact on service delivery in the sector.

Vega-Muñoz, Gónzalez-Gómez-del-Miño, and Espinosa-Cristia (2021:15) noted that as a result of the brain drain and its effect on the health sector in Africa a drastic increase in: i) infant mortality and malnutrition rates, ii) high rate of unsupervised births, iii) lack of malaria control, iv) Guinea worm, v) HIV/AIDS and tuberculosis infections and also vi) COVID-19 infections and deaths. In short, the health sector in Africa is performing below expectations. Emmanuel, Pantuvo, Muwanguzi and Ahmadu (2019:56) contend that the health sector is facing an HRH crisis. If the problems and current trends continue, the public health sector will suffer internal losses of public health workers migrating to the private health sector and foreign and private NGOs. Although sketchy, there is some proof that skilled health professionals leave to go into non-health professions, which has also caused a significant setback for the health industry in general (Boskovic et al., 2021:11).

3.5 RECRUITMENT AND RETENTION OF HEALTH WORKERS IN THE PUBLIC HEALTH SECTOR IN SOUTH AFRICA

According to Dorelien (2019:6), recruiting and retaining nurses is different and complicated under the practices of the various health facilities. However, ensuring an environment that is conducive to healthcare practices might create an atmosphere that would be effective in the recruitment and retention process. Rai, El-Zaemey, Dorji, Rai and Fritschi (2021:6) evaluated the environment of the healthcare professionals' current places of employment to determine if it influenced their preparedness to remain employed in the health sector. They uncovered the difficulty in recruiting and retaining registered nurses as a deterrent that hospitals face yearly. Molete, Stewart, Moolla and Igumbor (2021:8) remarked that numerous studies had identified an increase in the vacancy rate of nurses. Yet, it is difficult to determine the accurate vacancy rate of hospitals because they do not report the rate of turnover, they experience due to a lack of adequate systems in place.

Shipalana (2019) supports Dorelien (2019) in their studies on the recruitment and retention of healthcare professionals in SA by indicating that it is seen as a significant concern in SA with the high turnover rate of skilled health workforce at specialist and tertiary hospitals. This is a signal of failure to attract and retain healthcare professionals in the country. Furthermore,

several critical recruitment and retention strategies are needed to be put in place to attract scarce skills in the medical field (Bhembe, 2020:50). Perhaps a suitable strategy can be achieved through the identification of the following factors: i) financial incentives, ii) promoting work sovereignty, iii) career growth, iv) flexible working and shift hours, v) safety in the facilities, and vi) governance (Shipalana, 2019:497).

A study conducted by Aurilio, Mosca and Dorrington (2019:494) on the development of nursing workforce diversity through an internship programme shows that such an achievement would be successful through the effective use of a recruitment and retention programme known as Assuring Success with a Commitment to Enhance Nurse Diversity (ASCEND). Aurilio et al. (2019:495) further mentioned that a hospital that implemented the ASCEND programme had won an award at the American Organization for Nursing Leadership (AONL) in the 2019 Prism Diversity Award (PDA). This describes how the ASCEND programme provided an instrument for strategic nurse's recruitment according to their demographics and would require further support to improve the programme used in the health sector.

Williams and Ferguson (2021:36), emphasised that healthcare organisations faced challenges in instituting effective recruitment and retention programmes to increase nursing workforce diversity. Perhaps increasing enrolment and successfully graduating less privileged nursing students was a priority, as nursing leaders identify the link between a culturally diverse nursing workforce and the ability to provide quality, cultural and competent healthcare (Monica & Reddy, 2020:489). ASCEND has provided clinical internship professional development programmes of up to senior bachelor's degrees to nursing students from less privileged communities choosing to go into the nursing profession. This programme was offered to the less privileged in the African American communities to get healthcare education (Aurilio et al., 2019:494). In conclusion, the programme focused mainly on teamwork, communication skills, healing relationship skills, family centred care, and professional growth, which, if effectively utilised and interoperated with other IS, will improve healthcare services.

3.5.1 Performance management for retention in the health sector

Performance management practice is a process used to monitor workers' performance in organisations, and the health sector is not an exception (Alsafadi & Altahat, 2021:520). In a study conducted by Mulievi and Wanyama (2019:970) on the influence of performance management on employee retention in the health sector, they mentioned a need for hospitals to implement performance management in their various departments although it was found to have minimum influence on workforce retention. For the health sector to retain its skilled workforce, there should be a process to appraise the performance of the existing workers,

which will require IS to achieve it. However, Kilesi (2018:55) proposed an effective performance management system is needed to enhance workforce performance and strategize the solutions and programmes by the government to improve the healthcare system.

3.5.2   Healthcare workers' motivation and retention

Motivation in the health sector can be linked to workforce retention, according to a study on African healthcare worker motivation and retention approach. Taye, Morankar, Abdulahi, Admasu and Tadele's (2019:1) study points out that the scrutiny of healthcare workers' job satisfaction and incentives are essential features to consider when trying to retain personnel and deliver an effective health service. The study's objective was to identify factors and other processes impacting workforce motivation and healthcare retention. Nicol et al. (2021:4) suggest that for the health workforce to be retained, the health sector should find a solution to deal with two factors. Economic factors deal with proper incentives, and structural factors deal with regular and consistent staff promotion and inspiration at work. However, Taye et al. (2019:5) further mention that to retain skilled health specialists, the health sector has to put in place the following forms of motivation: i) incentives, ii) increasing salary, iii) income-generating options, iv) free healthcare services, v) provision of housing/housing allowance, vi) improved training, vii) encouraging further education, viii) more frequent promotion and ix) establishing a good relationship among workers. Mwarey, Hafner, and Nyamupachitu (2014) also suggest that the high turnover rate and retention challenges are related to salary issues. They add that the lack of practical training and career development opportunities, and the lack of resources to implement the training skills to empower the workers, affect the retention strategies to be implemented.

Fundamentally, most skilled health workers resign from their jobs to either further their education or for family and personal reasons. Some workers either leave the public sector to join NGOs or the private sector, while others start businesses either in healthcare or other sectors (Sirili & Simba, 2021:3). All these are due to poor motivation in the health sector, which presents barriers affecting the retention of the skilled workforce (Beloor, Nanjundeswaraswamy & Swamy, 2017:176). However, there is a need for further investigation to be conducted to find out other ways to encourage and motivate the health workers for retention in the sector.

3.6 STAFF TURNOVER IN THE PUBLIC HEALTHCARE SECTOR

The health sector has the highest record of staff turnover and employment-related issues in SA (Iwu, Bayari & Jaiyeola, 2019). Staff turnover is characterised as a critical phenomenon in the health sector. However, Nayak's (2016:1) study on turnover intention in the healthcare sector indicated that the participants in the healthcare systems are striving to render effective, efficient, and equitable healthcare in an environment that is enduring changes in IS, services, and operating models. In this scenario, the performance of the healthcare facilities is mainly dependent on the knowledge, skills, and motivation of the workforce.

Incidentally, Turner (2020) supports Nayak (2016) by indicating that healthcare institutions worldwide, most especially in Africa, face a severe shortage of skilled healthcare workers, which is further deepened by the problem of staff turnover intention. For this reason, Nayak's (2016) study suggests that it has become crucial for health facilities to explore the perceptions of the healthcare workforce in terms of their turnover intentions. This concerning factor affects and shapes their decision to resign, and therefore there is a need to introduce an IS to control the turnover rate of the workforce.

3.7 HEALTHCARE SERVICE WORKERS IN REMOTE/GANG-RIDDEN AREAS IN SOUTH AFRICA

3.7.1 The impact of gang-ridden localities on workforce recruitment and retention in the health sector

Recruitment and retention of the workforce in areas such as Cape Flats (gang-ridden localities) in the WC of SA is one of the significant challenges facing the health sector in SA. Seymour, Mwalemba, and Weimann (2019:4) mentioned that the Western Cape Government (WCG) is committed to providing "access to centred quality healthcare in the Cape Flats region by adopting a theme of leadership, innovation and change". Yet, the health system in those areas is demoralising, discriminating and unsafe. In a study conducted by Martiniuk et al. (2019:1) on improving literacy in the health sector and the impact on skilled workforce recruitment, retention in socially deprived areas was one of the fundamental obstacles to health in those areas. There was also an insufficient health workforce in those areas. Berzenn (2018:27) also highlighted a lack of understanding and communication between the health workforce and stakeholders. This is a significant problem affecting healthcare in gang-ridden areas. Literacy in the health workforce is essential. Illiteracy of the health workforce affects their capacity to make informed judgments and take action to keep health workforce needs in line with the health requirement of those communities (Berzenn, 2018).

3.7.2   The retention of skilled healthcare workers in remote areas

The retention of skilled health workers in remote or rural areas is a great challenge affecting the health sector. That harms service delivery in the industry where people have to relocate to urban areas to get the services they need in healthcare. However, Sirili et al. (2018) conducted a study on the retention of doctors in remote regions in Africa and identified the findings in Table 3.5.

Table 3.5: The number of doctors in the rural and urban areas of Africa
(Sirili et al., 2018:2)

Area	Workforce ratio to population
Rural area	75% of the African populations in the rural areas, only 25% of doctors are serving them.
Urban area	25% of the African populations in the urban areas, 75% of the doctors are serving them.

Sirili et al. (2018:2) further identified the factors that affect most doctors working in rural areas: i) unfavourable working conditions, ii) lack of assurance of career progression, iii) uneven financial incentive systems across the board; iv) unsupportive environment in the community which is characterised by difficulty in securing an apartment for rent, lack of opportunities to earn extra income, lack of appreciation from the community and poor social services. A lack of appreciation is a complex situation inherent to career decision-making. Darbyshire et al. (2021:2) concur that there is limited research on the retention of doctors in rural areas.

Essentially, there is a need for a broader approach to addressing the multiple factors rather than focusing on a single factor that limits the retention of doctors in rural areas for effective service delivery. Sirili et al. (2018) suggest the need for healthcare managers across the districts to retain their doctors through various retention strategies such as: i) career growth plans, ii) financial incentive packages, iii) opportunities for private practice in the district hospitals and also iv) have an IS to communicate with the health workers on what they need to do to retain them in the rural areas.

George et al. (2019) support Sirili et al. (2018) in their study on doctors' retention and distribution in post-apartheid SA and view doctors' emigration from SA as a "financial loss". Consequently, financial loss is regarded as a threat to service delivery in the healthcare sector. In reaction, the SA government has an obligation to produce more health specialists to meet the country's demands. Currently, the SA medical schools have increased their student

admission and changed their selection standards, but not much is achieved on the influence of these changes in the health sector of the rural areas and the country in general (George et al., 2019; Gurmessa, 2019).

George et al. (2019:4) note that 60% of their research participants had finished their vocational training in the rural areas, and 89% (444) worked as doctors in SA, while 6.8% (34) worked outside the country. 3.8% (19) have left the medical profession, and only 8% of the 444 doctors in SA worked in the public sector. Also, 8% of the 444 who worked in the public sector were still in professional training and were likely to migrate to the private sector or other countries or even leave the healthcare sector to work in other sectors.

Black graduate doctors constitute most doctors practising in rural areas. This confirms the importance of selecting students with rural upbringing to provide doctors for the rural areas and offer an effective IS as a starting point for future tracking of studies and training of doctors for rural areas (George et al., 2019). However, reflecting on the current scenario and forecasting the future demand for medical doctors in sub-Saharan Africa up to 2030 and towards equal representation of race and gender is required for effective healthcare in the rural communities (Tiwari et al., 2021b). Perhaps black doctors are poorly represented in the ratio of qualifications in the specialist medical field, yet they are more represented in the rural communities of SA.

3.7.3   Factors contributing to the shortage of skilled health workers in remote areas

Researchers identified numerous factors contributing to the shortage of skilled health workforce in rural areas. In a study conducted by Shipalana (2019:497), the lack of workers in the rural areas of SA was caused by the following identified reasons: i) inadequate supervision, ii) poor referral and support structures, iii) lack of appropriate equipment and drugs, iv) poor management structures, v) remoteness, vi) poor job satisfaction, vii) job frustration, viii) occupational stress, and ix) community-related issues. Zapata et al. (2021) agree with Shipalana (2019), and both studies insist that adequate measures need to be put in place to ensure that a skilled health workforce is recruited and retained in the rural areas where they are most needed and also to find ways to encourage skilled health workforce to be more interested in serving the rural areas of SA.

3.7.4   Strategies for recruitment and retention in remote areas

For adequate health workforce recruitment and retention to be implemented, strategies should be implemented. In Malema and Muthelo's (2018:2) review of methods for recruitment and

retention of skilled healthcare workers in remote rural areas of SA, they found an uneven distribution of the health workforce between the urban and rural areas. The indication was that the metropolitan area had a more skilled health workforce than rural areas, and the rural areas are believed to be more populated than urban areas. Yet only a quarter of the nurses and less than a quarter of the doctors in the public health sector served these rural areas. Coincidently, Malema and Muthelo's (2018:2) study further argued that as of 2010, the WHO's (2010) recommendation emphasised that in Africa, there should be one doctor per 1000 patients. Still, in sub-Sahara African countries, 16.4 doctors serve 100,000 patients in remote or rural areas instead of 100 doctors as recommended by the WHO. Perhaps this indicates that Africa still has a long way to go in retaining the skilled health workforce to deal with the crisis at hand. To achieve recruitment targets, HR should follow best practices such as: effective recruitment planning, searching for, screening, shortlisting, and evaluating the right candidates. HR should also ensure such procedures are conducted through an information system for consistency and compliance in the recruitment process (Mohammed, 2021; Washeya & Fürst, 2021).

Mofolo et al. (2019:3) note in their study on the World Health Organisation (WHO) and Global Health Workforce Alliance (GHWA) (2014) that there is a global shortage of 4 million health workers. Essentially, these workforce reductions were expected to be ameliorated to achieve quality healthcare services. But currently, the global shortage of health workers is estimated to be about 7.2 million and could reach 18 million by 2030. However, all these estimates identified by researchers required key strategies for workforce retention, such as: i) education and training of healthcare workforce, ii) review of regulations and policies regarding the provision of healthcare services in rural areas, iii) provision of financial incentives and iv) personnel and professional support of healthcare workers (Malema & Muthelo, 2018; Udekwe et al, 2021a). Therefore, there is a need for further studies to be conducted to identify how these strategies could be initiated with the use of effective IS to retain the healthy workforce in rural areas.

Afriyie, Nyoni and Ahmat (2019:1) studied the issue of the state of strategic plans for the health workforce in Africa and mention that most countries in Africa had a shortage of health workers in rural areas, which relates to the WHO regional roadmap for scaling up the health workforce from 2012 to 2025. However, one of the significant points of interest regarding the WHO's roadmap to health workforce retention was the development of the National Strategic Plan (NSP). The plan was introduced in 2014 to serve as part of the vehicle for implementing Universal Health Coverage (UHC). Practically, it would be effective for the retention of health workers in remote areas if properly implemented (Laurenzi, 2020:105).

3.8 TALENT MANAGEMENT IMPACT ON RETENTION IN THE PUBLIC HEALTH SECTOR IN SOUTH AFRICA

Talent management (TM) is described as a systematic and integrated process designed to recruit, attract, and retain a skilled workforce. Looking at TM's impact on the workforce's retention and performance in the health sector, it is expected to elevate the process of retention in the health sector (Onuko & Onyango, 2020:3). Dayel, Debrah and Mulyata (2020:5) described the retention of the health workforce as a critical component in an organisation's attitude to TM. They define TM as "the implementation of integrated strategies or systems designed to increase workplace productivity by developing improved processes for attracting, developing, improving, retaining, and utilising people with the required skills and ability to meet current and future healthcare needs". Kumar and Hedge (2019:46) also describe TM as "the process of attracting, selecting, training, developing, and promoting employees in an organisation". Every economic sector, including health, aims to grow and improve its systems and processes. The health sector needed to focus on its workforce performance and potential or the workforce practices to allow growth and improvement through the best-known practices of TM regarding retention in the public health sector.

Kumar and Hedge's (2019:46) study on TM programmes and the impact on employee retention and performance in healthcare found that TM programmes in healthcare were a way of creating a good working culture and enhancing the value of staff and reduction in staff turnover for retention purposes. Dayel et al. (2020:5) support Kumar and Hedge's (2019) claims on the effect of TM development in the healthcare sector and made the point that human capital is regarded as the most crucial factor for competitiveness in the health sector as there was an increase in demand for health workers. However, the main challenge faced was the shortage of skilled professional talent which is an obstacle to the health sector as global scenarios needed to identify. Perhaps there is a need for effective use of the TM system to eliminate those challenges related to retention in the health sector.

Practically, TM can be seen as a response to changes in the workplace due to globalisation and competitiveness. However, the health sector could be more interested in managing the talented workforce to ensure high quality, long-term competitiveness, attainable prosperity, and uninterrupted development. Also, Nakato, Mazibuko and James' (2020:1) study shows that an enabling and stable work environment and career development influence effective TM more than organisational support and employee satisfaction in the public health sector of SA. Further investigation is needed to identify the importance of nurturing and monitoring professional self-sufficiency and recognise personal values to augment TM in the South African health system effectively.

3.9 LEADERSHIP AS A DYNAMIC IN PUBLIC HEALTHCARE SERVICE WORKFORCE RETENTION IN SOUTH AFRICA

Good leadership can be acknowledged as a dynamic to further retention in the health workforce. In research conducted by Spinks (2019:2) on the perceptions of leadership as a dynamic in health workforce retention, it was realised that in the past, stakeholders in healthcare had anticipated early retirement of the nursing workforce due to poor leadership. This also signalled a significant influence that caused a global nursing shortage. Nursing shortages are known to harm patients' welfare and medical results, which warrants a call for strategies to improve the devastating health workforce situation in SA (Nesengani, Downing, Poggenpoel & Stein, 2019:1). However, if no resolution is found, it would put the nursing structure leadership in a bad light, affecting workforce retention. Spinks (2019:2) recommended using an Authentic Leadership Theory (ALT) to identify retention dynamics among skilled nurses. The use of ALT would be connected to improving patients' medical results and the potential to provide the speculative IS support desired to produce better-informed nurses of the new generation in terms of leadership training and development.

3.10 TASK-SHARING AMONG THE WORKFORCE IN THE HEALTH SECTOR OF SOUTH AFRICA

The HR vision of task-sharing in the public health sector is regarded as an option when there is a shortage of skilled health workers, especially in LMIC. Coincidently, it has attracted a global world health demand for skills support and healthcare provision to the public. However, a more effective manner has been explored, namely task-sharing that helps expand the duties of low-skilled workers by allowing them to share responsibilities with highly trained healthcare workers (Akeju et al., 2016:115). Suwanda and Suryana (2021:1067) point out that training health workforce employees to do specific jobs and improve themselves has been a significant factor contributing to task-sharing. This also positively impacts expanding knowledge and developing the workforce's abilities to achieve better job performance.

Perhaps task-sharing is suitable for countries like Nigeria, which further, according to Akeju et al. (2016:115), is where there is a shortage of highly skilled health specialists and a massive burden on maternal mortality and other vital health areas. However, these problems have created concern amongst various stakeholders to adjust the level of supervisory restrictions placed on the less skilled workforce and the work they were allowed to do (Asamani et al., 2018:11). Consequently, task-sharing in the health sector has created an avenue to delegate duties meant for skilled workers to unskilled health workers, which were inappropriate and needed to be addressed.

Countries like Tanzania have since 1960 adopted a system of task-shifting that was later termed task-sharing strategy to address the critical health workforce shortage (Sirili, Mselle, Anaeli & Massawe, 2020:149). These task-sharing processes have encouraged unskilled health workers, which had dampened the health sector due to a frustrating work environment and poor incentive system. This warranted the need for the government to focus on improving the work environment and provide appropriate incentives to achieve the objective of task-sharing strategy in the health sector and make sure that skilled health workers are used in the process.

According to Gray and Vawda (2017:4), task-sharing is defined as "involving the rational redistribution of tasks among health workforce teams. However, in some countries, specific tasks are moved, from highly qualified health workers to health workers with shorter training and fewer qualifications, to make more efficient use of the available human resources for health". The latter further highlighted that skilled clinical workers have been used extensively in many South African health facilities. Yet there is still a shortage of qualified medical workers in the public health sector of SA. Further, the number of clinical associates registered with the Health Professional Council of SA (HPCSA) remains low. As of 2013/2014, only 130 of the 220 on the HPCSA records are employed in the public health sector (Hlayisi, 2019:14). This requires the government to investigate how a task-sharing strategy can assist in sustaining the skilled workers in the health system of SA.

According to Indi's (2019:108) study on the use of an inexperienced health workforce in countries like India, Task-sharing has negatively impacted the sustainability of the healthcare system in the country. However, India still faces a considerable challenge in responding to the needs of the most vulnerable members of society. The total expenditure on health has forced almost half of the country's population into poverty. Bester (2018:1) argues that appointing lower-skilled health workers to do the work of highly skilled workers can affect the movement and treatment of patients who need emergency attention and create a high mortality rate in SA.

Tjoflåt et al. (2018) support Bester (2018) in their study on the roles of nurses in the health sector and how tasks were being shared among them; they indicated that nurses were perceived to have stronger professional pride, and were fast learners and also dedicated to serving the public if given the opportunity. Also, nurses were good at working as a team, but the continuous appointment of less-skilled personnel to do the work of the highly skilled in healthcare does negatively impact service delivery.

3.11   HEALTHCARE UTILISATION

Healthcare utilisation is described as the use of healthcare services, processes, and devices to uphold the health and well-being of the public. Fisher (2019:1) categorised healthcare utilisation as either discretionary or non-discretionary. **i) discretionary** refers to a situation where someone decides to seek hospital treatment by themselves, while **ii) non-discretionary** refers to a situation where health workers admit patients to the hospital for treatment against their will. Perhaps healthcare utilisation warrants a compulsory requirement of skilled health workers to be present in the performance of both discretionary and non-discretionary mandatory health service obligations (Buchan & Weller, 2012; Zalani et al., 2018). However, the public healthcare system does create an avenue where people are compelled to choose their path on the issue of healthcare service utilisation (Fisher, 2019; Siedner et al., 2020).

In a pandemic, the infected people must be treated urgently. Taking the current COVID-19 pandemic into consideration, infected people had no choice but to accept medical treatment and were forced to visit hospitals for treatment to curb the spread of the virus (Obi-Ani et al., 2021:5). Such a scenario requires further study to identify how a system can be used to create a platform for effective healthcare utilisation for the safety and well-being of the health workers and the society in a pandemic situation such as Ebola, COVID-19 and others.

3.11.1 Healthcare services workforce development

Health workforce development is a significant factor when considering service delivery in the health sector. A study conducted by Amde, Marchal, Sanders and Lehmann (2019) on the determinants of effective organisational training in health workforce development emphasised that sub-Saharan African countries such as SA were faced with complex challenges while justifying their obligations to service delivery and governance. In these processes, the WHO took up the challenge and funded four tertiary hospitals to implement a combined project comprising training and programme development. Amde et al.'s (2019:1) study also found that 70% of the participants stayed in their health facility and contributed immensely to improving management, policy, planning, research, training and programme development. However, the other 30% left for other opportunities due to a lack of suitable salaries, poor working conditions and poor career prospects, amongst others (Amde et al., 2019; Usman, Moosa & Abdullah, 2021). Therefore, there is a need to conduct further studies to identify ways that a system can assist healthcare in developing its workforce.

Organisations are using the recommended pandemic response by WHO to explore the planning norms, resource assessment and strategy adopted to equip their health systems. The COVID-19 pandemic has strengthened the strains between seriously integrated healthcare delivery and a partially dispersed public health system. Consequently, the resources needed to be assessed based on the projection for COVID-19 identified a shortfall of medical specialists to care for patients while maintaining 55% of the workforce for regular healthcare services (Usman et al., 2021:1). They showed that the lockdown policy bought time to increase hospital beds, devices, and other infrastructures. At the same time, they were still unable to increase the size of the skilled health workforce to meet the demand. Van de Pas, Kolie, Delamou and Damme (2019:1) contend that there is a need for collaboration between the government and development associates to forestall problems with the policy application of new health workforce placement in remote areas and further privatisation of health instruction to meet health workforce development and underlying labour market forces.

3.11.2 The governance of the national community health workforce programme in South Africa

The governance of the national community health workforce programme in SA was initiated to observe primary healthcare development. Still, based on pragmatic observation of SA's community-based health sector, there was no planned programme to strengthen health workforce development to support primary healthcare development (Schneider, 2018:18). However, resilience and active workforce development were crucial to improving the country's healthcare services. McCalman et al. (2019:1), in a review of primary healthcare workforce development, found that the direct healthcare workforce could be strengthened by bringing together healthcare providers while considering strategies to improve conditions to meet the healthcare needs of the community. This indicates that improvement in the quality of primary healthcare is needed, and a plan developed to support the programme.

The focus is on scrutinising the relationship among the entire public hospitals in SA through reinforcing governance and training capability for health workforce development at the provincial, national and local levels (Amde et al., 2019:3). However, three observations were realised in the programme: i) structuring the Provincial/Regional IS communication, ii) curriculum development among the health sectors, and iii) training of critically skilled specialists in the field of health workforce development. Furthermore, the study implied that health management must focus more consciously on the likely collaboration and best possible arrangements between training relevance, workforce selection for potential contribution to healthcare recognition and career progression possibilities.

Currently, WHO calls for healthcare specialists' tertiary training institutions to implement uninterrupted workforce development programmes and use modified training syllabuses that address timing challenges and the needs of the public (Jaana, Majdalani, Tamim & Rahbany, 2018:855). Yet, information about the precise requirements of the healthcare workforce development in various healthcare facilities in resource-inhibited surroundings remains limited. According to Bhembe (2020:47), workforce programme development is necessary for healthcare competencies. However, the current programme development in the health sector, such as training, does not meet the necessities of the recent health workforce development and would require to be substituted. The healthcare hospital managers and other facility managements are obligated to have leadership capability and high-level technical competence in the medical discipline for all the healthcare facilities to run smoothly.

3.12   ACTION PLANS FOR WORKFORCE DEVELOPMENT IN AFRICA (2017-2030)

The introduction of a framework to deal with actions relating to health workforce development and regulation in the health sector in the years (2017-2030) by WHO (2017a) specifically pointed out that the main challenge facing the health sector is the shortage of qualified health workers which adversely affects the overall productivity and services rendered to the public. Furthermore, unstable geographic distribution, unfavourable skill mix and the rapid changes in location of the health workforce were also identified in the framework (WHO, 2017a). Unfortunately, these are disturbing challenges that need to be addressed through a practical regulation that would require the use of IS.

Chen et al. (2021) support WHO (2017a) in identifying a framework that presents numerous anxieties concerning the quality, relevance and performance of health workers, where some countries face a delayed crisis resulting from the depletion of health workers, which has led to skill shortages, and concerns regarding the safety and security of health workers. Thus, there is a need for further study to identify a reliable and efficient Health Information System (HIS) to guide policies, plans and regulations that are significantly lacking in the global demand for the health workforce.

The WHO framework for an action plan (WHO, 2017a) further highlights the progress and execution of health workforce strategic plans that needed to be sustained, and identified the following factors that would enable the action plans to succeed as: i) reinforcing investment in the health workforce, ii) strengthening control and regulation capacities, iii) improving health workforce data and information, iv) ensuring access for all to an adequate level, and v) providing a competent, well balanced, motivated and responsible health workforce (WHO,

2017a). The WHO framework identified four major strategic plans set, and the expected objectives to be achieved within the year (2017-2030) are listed in Table 3.6 as follows:

Table 3.6: Overview of the framework for action plans for health workforce development and regulation in Africa

(WHO, 2017a:7)

Health workforce strategic plans	Objectives
(1) Develop and implement comprehensive health workforce policies and strategic plans to optimize health workforce availability, accessibility, acceptability, quality, and performance, based on understanding labour market dynamics.	(i) Scale up and sustain the production of health workers with appropriate quantity, quality, and relevance. (ii) Improve recruitment, deployment, retention, motivation, and performance of health workers. (iii) Regulate and manage exits from the health labour market strategy.
(2) Strengthen capacities for health workforce governance and regulation.	(i) Strengthen the capacity of health workforce structures at all levels. (ii) Establish and strengthen the regulation of health workforce practice and education.
(3) Mobilize and align investment in the health workforce to ensure implementation of strategic plans to meet current and future health workforce needs.	(i) Identify resources and requirements for health workforce production, recruitment and deployment and decent working conditions. (ii) Mobilize and secure adequate funding for improving production and employment capacity for health professionals.
(4) Strengthen the health workforce information base for designing, implementing, and monitoring health workforce strategic plans.	(i) Establish/strengthen health workforce databases, information, and evidence (ii) Ensure mechanisms to collect, report, analyse and use reliable workforce data, such as establishing/ strengthening a national health workforce observatory.

Coincidentally, Zalani et al. (2018) support the Gormley, McCaffery and Quain (2011) study as well as the WHO (2017a) report with regards to the effect of the Global Health Workforce Alliance (GHWA) on the action plan for health workforce regulation. To achieve the SDGs, they made the following recommendations to be implemented: i) support leadership-valued HRH requirements, ii) strengthen HRM systems, iii) initiate prioritised implementation of costs to HRH strategic plans to support successful HRH approaches, iv) address health workforce retention and motivation, v) increase job satisfaction and also vi) develop global guidelines to appropriate HRH components to achieve universal access to global health workforce development and regulations. Staden (2021:240) emphasized that the GHWA identified the value and outcomes of a capable and inspired health workforce in reshaping a resilient health system and improving health results. Perhaps the value of an inspired workforce in attaining national health and enhancing their objectives begins at the level of training, and that alone should not be underestimated.

3.13   UNIVERSAL HEALTHCARE COVERAGE IN SOUTH AFRICA

Nabyonga-Orem and Okeibunor (2019:1) defined universal healthcare coverage (UHC) as a "process of ensuring that every individual has access to needed healthcare resources that are sufficiently available and that the use of those health resources does not expose the users to any financial destitution". However, the lack of effective UHC could be attributed to poor health research finance, poor research coordination capacity, non-enforcement of laws and regulations, inadequate research infrastructure, and lengthy ethical clearance processes (Michel et al., 2020:2). Perhaps there is a high demand for global movement towards the UHC in Africa. Numerous plans and practical challenges are already in place to implement the expected achievable objectives and the need to reinforce and improve the movement of the UHC to achieve health workforce goals in Africa.

Unfortunately, the availability of workforce planning and policy implementation in the SA health sector is inadequate. This shortage is reflected in critical resource shortages such as maldistribution of HR resources and limited access to quality healthcare services (Tiwari, et al., 2021a). These shortages are detrimental to the health industry. However, Anaemene (2019:76) suggests the need for the availability of additional workers such as occupational therapists, speech therapists, audiologists and physiotherapists. Anaemene (2019) also identifies a need for an equity-based health workforce planning approach to reduce inter-provincial inequalities by the year 2030 in the South African public health sector.

3.13.1 The introduction of the universal health coverage scheme in South Africa

The introduction of the UHC scheme in SA is a remedy for solving health-related problems. A study by Pozo-Martin et al. (2017:5) on public policy and planning towards UHC in the healthcare workforce asserts that planning and procedures for healthcare providers are necessary to ensure the provision of high standards of health services and also to support the accomplishment of UHC of 10.2 medical personnel per 10,000 population in Africa. African countries working towards UHC need to keep track of the size and structures of their health workforce and future needs regarding the HRH practice and purposes (Marcelo, Medeiros, Ramesh, Roth & Wyatt, 2018; Michel et al., 2020). Perhaps there is a need for high standards of comprehensive HRH to support all policies made towards UHC and health-related SDGs.

Interestingly, the WHO health workforce policy and planning necessary for UHC and health-related SDGs is quantified through an advanced pragmatic approach, which suggests a new yardstick for policy implementation for health workforce requirements to have sufficient physicians, nurses and doctors in the South African health sector (Tiwari et al., 2021b). Akther

and Hussain (2020) are in agreement with Tiwari et al. (2021b) in their recent study based on the National Sample Survey Organization (NSSO). They discovered that countries like India have 20.6 health workers per 10,000 people, which is less than the minimum requirement set by the WHO. However, India's pursuit of UHC depends on the adequacy and effectiveness of HRH in providing a practical policy and planning in place for healthcare services in both the private and public sectors.

3.13.2 Development of Health Information Resource System for UHC

The need to develop a technology such as Health Information Resource System (HIRS) to support the UHC in the healthcare system was identified by Solissa, Arifin, Asdar and Razak (2019:651). They discovered that there was no comprehensive management and development of technology to support UHC implementation, especially in rural areas. However, there is a need for the government to pay more attention to the use of technology such as HIRS to support the implementation of UHC within the country's healthcare system (Park, Asgarova, & Kim, 2014; WHO, 2022).

Incidentally, UHC is critical to developing a nation but would need to be technologically advanced to be effective. Saifuddin (2020:1) believes that a government without an IT-driven UHC to access remote areas and the isolated population does impose threats and challenges to the sector, such as overpriced medical bills that will result in the larger population being driven below the destitution line and financial difficulties. Coincidently, Staden (2021) concurred with Saifuddin (2020) because UHC is contingent on having a skilled and knowledgeable workforce to meet the health obligations of the 21st century in SA. However, without an effective IT infrastructure to support the system, it will not be viable. Perhaps improving the health system without proper technology will negatively impact economic growth, which will also affect service delivery in SA. Also, the fact that equity in health service delivery in SA has declined drastically is a challenge (Aggarwal, Zodpey & Garg, 2021:6).

According to Rees, Quispe and Scotter (2021:3), as of 2009, countries such as Peru adopted UHC and were expected to be fully operational through IT structures as of 2021, and to have achieved benefits such as: i) contribution of a compulsory structure for workers and voluntary contribution of self-employed persons, ii) minor and moderately subsidised voluntary scheme for maintenance and microfinance owners and iii) a fully funded scheme that covers the poorest population. However, currently, the effect of the adoption of UHC using technology is yet to be accomplished.

3.14   NATIONAL HEALTH INSURANCE FUND IN SOUTH AFRICA

The African National Congress (ANC), a famous ruling political party in SA, initially suggested initiating a comprehensive National Health Insurance (NHI) scheme in the country while they were still fighting for political freedom in the early 1990s (Michel et al., 2020:1). However, this was enclosed in their National Health Plan (NHP) of May 1994 when the new democratic government was elected (Gilson et al., 2017:60). Various stakeholders such as political parties, government departments, medical schemes, private medical providers, and civil society organisations were involved (McLeod & Grobler, 2009; McIntyre, 2010).

Essentially, the new democratic government of SA intended to introduce speedy plans under conditions of disintegration and financial uncertainty, particularly in the health-related schemes but was taken unaware by future uncertainties (Tshabalala-Msimang, 2008). Surprisingly, due to unawareness of future uncertainties, the national government revived the debate of initiating the NHI in the middle of 2000 after substantial progress was made to stabilise the National Healthcare Sector (NHS). Therefore, by late 2008 the initiation of NHI came to a level of structural change to address the challenges facing the South African health system and ensure fairness in the health delivery services (McLeod & Grobler, 2009).

3.14.1 The introduction of the national health insurance scheme in South Africa

With the introduction of the NHI scheme, all South African citizens and permanent residents would be provided with vital healthcare services regardless of their employment status and the ability to make payments to the NHI fund (Bernitz, 2014; Mukwena & Manyisa, 2022). The idea of the NHI scheme is to abolish the obstacles that limit the poor masses' access to affordable healthcare facilities and to ensure that they are financially protected from the catastrophic health-related expenditures for poor households and individuals through a pre-payment system (Department of Health, 2012). Essentially, the NHI scheme would be expected to provide all the required funds and health service delivery instruments that would enable a sustainable, efficient and equitable health service in SA (Slabbert, 2011:33).

Nicol et al. (2021:1) asked if the Health Information System (HIS) in SA is ready to support the planned NHI scheme. The scheme requires a reliable and standard HIS to support and diagnose all the financial and other related disbursements, including resource management, to measure the support. Consequently, Nicol et al. realised the absence of coded patient and workforce information and the availability of standard IS to support the implementation of the NHI in terms of financial and resource management. Giannouchos, Vozikis, Koufopoulou, Fawkes and Souliotis' (2020:762) study on the effectiveness of the NHI scheme notes that

there are differences in the management procedures of the various hospitals. Some clinical diagnoses are not covered by NHI, which can create an informal payment process among the health workers in different facilities, especially in the public health sector. However, several hospitals have implemented a HIS to support the NHI insurance scheme, yet its effectiveness in the health sector is still not achievable (Deharja, Hargono, Santi, Nandini & Damayanti, 2020:381).

3.14.2 The initiation of the national health insurance scheme in South Africa

The SA Department of Health genuinely set the ball rolling by starting the NHI scheme in 2012 which is estimated to be fully operational by 2025. The start-up plan was initiated in 3 different stages to achieve success in the health sector (Department of Health, 2015). The 3 stages are itemised in Table 3.7:

Table 3.7: National health insurance scheme initiation plan in South Africa
(Department of Health, 2015)

S/NO	Period	Comments
1	From 2012 to 2016	Geared towards constituting and strengthening the health service delivery platform and the overall improvement in the quality of the public health sector.
2	From 2017 to 2021	Building the necessary structures and facilities that the NHI would operate upon.
3	From 2022 to 2025	We will be focusing on guaranteeing that the NHI will be fully functional without any delay.

In June 2018, the then Minister of Health in SA submitted a bill on NHI to parliament to speed up the approval of the changes where both private and public healthcare are given equal opportunity for services and financial obligations to society (Crush, 2019:5). However, in a research survey by Crush (2019:6), it was discovered that such a move would be devastating, undesirable and dubious and also will cause the emigration of over 80% of the health workforce. Ideally, when the NHI scheme is fully operational and thriving with the suitable capacity of the health workforce, there would be a need to recruit workers through the right channels, and all of these would require an effective system in place to achieve it in SA.

3.15   CHAPTER SUMMARY

This chapter presented the state of the health sector in SA. It focused on the introduction and background of SA's health sector, challenges, strategies, loss of intellectual capital, and emigration in healthcare, the NHI and UHC. The major challenges faced by the health sector in SA such as inequality, disintegration and favouritism were itemised, and the effect of these challenges on health sectors sustainability were highlighted. Other issues such as health workforce developments, retention strategy and the current situation in the South African health sector workforce were also discussed. Recruitment and retention in the South African health sector, most especially in the country's remote/rural areas, has been an issue for various reasons mentioned in this chapter. The need to investigate ways to operate the health sector in SA to motivate and retain the health workforce using an effective IS to rectify the gaps identified.

Health workforce development in SA is a significant factor when considering service delivery. The lack of adequate regulations to monitor and control workforce availability in SA was also mentioned. The impact of workforce regulations as they affect the lives and working environment of the health workers was itemised. A need to design a health workforce development plan through the observation of issues such as: structuring a provincial/regional IS interface, programme development and training of critical skilled specialists in the use of IS relevant.

The SA government are in the process of ensuring that every individual has access to required healthcare resources that are sufficiently available and ensured that the use of those health resources does not expose the users to any financial risk. As it relates to the SA health sector, UHC was also indicated. The main challenges faced by SA from achieving a UHC were also mentioned, and the need for high standards of widespread HRH to support all policies made towards UHC and health-related SDG were highlighted to that effect.

The NHI in the South African health sector was also noted, including the introduction of vital healthcare services for all South Africans and permanent residents regardless of their employment status and ability to make payments. This process was initiated in 2012 and is expected to be fully operational by 2025. Yet there is still a high workforce shortage to achieve it, and such challenges were also mentioned in this chapter.

The progress and execution of the health workforce strategy in SA calls for competent, motivated, responsible, and sustainable recruitment. The WHO proposed a framework to initiate an action plan in Africa (2017-2030). The reasons why this plan is still being delayed were also itemised. Some of the reasons are the lack of effective IS and the availability of

workers to succeed in the action plan in Africa (WHO, 2017a; Afriyie et al., 2019). The next chapter is a further continuation of the literature review and will focus on the effectiveness of HRIS in relation to the health sector workforce in SA.

CHAPTER FOUR: THE EFFECTIVENESS OF HRIS IN RELATION TO THE HEALTH SECTOR WORKFORCE IN SOUTH AFRICA

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Figure 4.1: Layout of Chapter 4

This chapter discusses the concept of the effectiveness of HRIS in relation to the health sector workforce in SA, and its benefits in the healthcare setting.

4.1   HUMAN RESOURCES AND INFORMATION SYSTEM IN THE HEALTH SECTOR

4.1.1   Introduction

Information Systems (IS) are regarded as a critical aspect in the HRM improvement of any organisation. Combining HR and IS assists organisations to utilise the benefits it offers and could lead to competitive advantages. HRM itself is the centre of employee management that will require HR policies and practices to achieve success (Kloutsiniotis, Mihail, Mylonas & Pateli, 2022; Holland, Dowling & Brewster, 2022). Suryana, Agustina and Wardiyanto

(2019:94) conducted research into the assessment of policies in HR and IS for the workforce in healthcare and observed the following challenges: i) the discharge of health workforce necessities in all areas of the society is still a big challenge that must be faced, ii) the management of healthcare is not friendly and united, iii) the national and provincial offices do not involve the authorities in determining the number of employees required, and iv) there is no effective IS in place to coordinate the health system in general. Miu and Moore's (2021:2) study also observed that there is no unity and compassion between the management and their workforce in the health sector. This is a result of the unfavourable policies on how to combine HR and IS in the health sector. Furthermore, research is needed to identify the best possible ways to merge both HR and IS to achieve great success in healthcare.

The management of HR in healthcare cannot be effective without using an IS and an adequate policy in place. Antony and Balu's (2018:122) study indicates that healthcare comprises two factors known as material and the human factor: **i) The material factor** consists of hospitals, medical infrastructure, medical devices, clinical trials, outsourcing, telemedicine and health insurance; **ii) The human factor** is regarded as the crucial factor to the sector, yet suitable HRM in the sector has remained beyond the reach of the healthcare facilities (Tursunbayeva, Bondarouk & Martin, 2022). Aurilio et al. (2019:494) align with Antony and Balu's (2018) study which highlighted that healthcare recruitment and retention are intricate matters requiring an effective and logical IS retention programme. Furthermore, this will create an environment that encourages workers to remain functional through having policies and practices in place that address their diverse needs.

4.2 HUMAN RESOURCES FOR HEALTH IN SOUTH AFRICA

The HRH in African countries such as SA is primarily affected by various health crises caused by misdistribution, poor retention, and poor motivation. The solutions to these crises are yet to be developed. Emmanuel et al. (2019:55) explain that shortages in the health workforce, especially skilled specialists, are critical in the continent. They also explain that the inadequate number of health specialists has lately deteriorated due to economic tension and variable health service reforms. Asamani et al. (2019:1) highlight the causes of the weakening of HRH in the African continent as: i) lack of motivation due to poor and unreasonable salaries, ii) dilapidated hospital infrastructure, and iii) unreliable supervision and restricted career opportunities within the health sector.

Anaemene (2019:59) commented in a report on the future of health development in the African continent that health is fundamental to the UN SDGs, and the health system's future shows

that there are relations between health and growth in the continent. By 2030, all the economic and social development plans must be achieved through advanced technology (Asamani et al., 2020). However, the effect of those identified causes in the HRH are as follows: i) combined effects of augmented retrenchment, ii) voluntary retirement, iii) departure from work, iv) search for better opportunities, and v) sickness and subsequent death that resulted in mass erosion in the health service (Emmanuel et al., 2019:56). These effects can have consequential impacts when there is an ineffective IS to control the process of HRH in SA.

4.2.1   Human resources for health policy in South Africa

A study conducted by Saka (2013:2) on the strategic Human Resources for Health (HRH) policy and implementation plan for SA found that it has been designed to embrace the transformation of health systems. The HRH needs to be affordable, equitable and accessible. However, there is a lack of effective stewardship in government, which translates to a fragmented health service delivery. Fundamentally, one of the reasons why the transformation has not been achieved is the lack of coordination between role-players. However, there is a need to necessitate investment in HRH across SA for improved access to primary healthcare to transform the health sector into a more digital system (Grundy, Dakulala, Wai, Maalsen & Whittaker, 2019:77).

Tiwari et al. (2021a) believe that the public health sector recuperation of HRH workforce planning and policy enactment is inadequate and results in critical HR workforce shortages, creating limited access to quality healthcare services in the sector. Essentially, SA has been implementing the NHI and Primary Healthcare (PHC) reinforcement through IS and later introduced the HRH strategy (Mofolo et al., 2019:1). The strategy was also supported by the National Development Plan (NDP), which aims to address the pervasiveness of inequality in the South African health sector.

However, there has been a lack of commitment to HRH policies (Zalani et al., 2018:846). This does not bode well for the successful implementation of NHI and PHC re-enforcement on HRH strategy in the health sector of countries such as SA. Kumar's (2018:308) study aimed at evaluating the alliance of national HRH-related policies to embrace the implementation of NHI and PHC re-enforcement to achieve the HRH expected goals.

4.2.2   Challenges facing human resources for health

According to Rees et al. (2021:3), several healthcare institutions in some countries are improving in terms of increasing the number of health workforce through various qualification

networks in those countries. Yet, the influx of pandemics such as COVID-19 does not give room for the effectiveness of HRH strategy due to the loss of those skilled and qualified health workers.

Bolan et al. (2021:1) identified 10 categories of HRH-related challenges that impede the provision of quality health treatment in LMICs, namely i) lack of HRH records, ii) poor health workforce preservice tutoring, iii) lack of health workforce access to evidence-based procedures, ongoing education, and continuous proficiency improvement, iv) an inadequate and unbalanced distribution of health workforce and heavy workload, v) poor retention, absenteeism, and rotation of skilled workforce, vi) poor work atmosphere and salary, vii) poor and restricted supervision, viii) low morale, motivation, defiance, and job dissatisfaction, (ix) flaws of policy, regulations, administration, control, and finance, and x) operational and relative disadvantage (Bolan et al., 2021). These identified challenges posed a significant threat to the sustainability of HRH succession in the healthcare system.

Subsequently, the COVID-19 pandemic has ridiculed the importance of health workers in providing healthcare services while preserving other essential health services in SA. However, it is necessary to strengthen the workforce response capability to ensure and support their work-related safety from the pandemic infection (Zapata et al., 2021:S76). Furthermore, there is a need to investigate the policy landscape to create opportunities to link the actions related to this present COVID-19 pandemic to long-term HRH strengthening approaches using an effective IS for proper control measures in the health sector (Widjaja, 2021).

4.3 HEALTH INFORMATION TECHNOLOGY IN THE HEALTH SECTOR OF SOUTH AFRICA

The health sector's shortage of skilled workers is a significant global concern that poses a severe challenge to healthcare delivery in a country. Essentially, there is a need to introduce an appropriate Health Information Technology (HIT) structure in the health sector to assist in coordinating the professional, personal support, and quality management processes because the health workforce is essential in any health system (Sarkis & Mwanri, 2013:68). Ideally, the role of HIT in strengthening the health sector is significant, and this modern age is marked by rapid technological developments that routinely affect social change. Interestingly, research into the potential applications of innovative technologies has encouraged HIT usage in justifying the processes, enhancing communications, education and health promotion (Barrett, 2021:3). However, as computer literacy, IT and comfort levels vary, particularly among health professionals, some of the potential uses of innovative technologies may be beyond the current capacity of users (Gavurová, Balloni, Tarhaničová & Kováč, 2018:1).

Warui (2016) believes that innovative technology needs to be extended to mobile services. Subsequently, in applying innovative technologies, user training and testing could be required to accompany the implementation and effective HIT. Perhaps this will enable managers and employees to be acquainted with HIT and other innovative technologies for proper communication, performance, reporting, teamwork, knowledge sharing, learning, and administration through a wireless technology application using extranet applications, internet, and intranet connections.

Yusif, Hafeez-Baig and Soar (2019:12) identified the needs and demands of healthcare facilities and realised that the HIT applied in some countries was unsuitable for their healthcare due to poor planning, lack of sufficient finance and personnel. Hidayah, Aini and Amin (2021:484) advise that the demand for HIT to provide online consultation to the population and medical personnel minimises the increase in anxiety and depression caused by the increasing number of confirmed cases of deaths due to COVID-19, and has increased the demand for IT in healthcare. Perhaps there is a need for further research to identify a better solution in endorsing an effective HIT through support structures from the government in investing funds in IT in health in general.

Research in the field of HIT has shown that IT provides operational and economic business and service values and improves the quality and safety of patients and workers (Zareravasan & Alizadeh, 2021:52). Zareravasan and Alizadeh's (2021) results correspond with Defitri's (2020) study on demand for HIT in the public health sector, suggesting a need for research to be conducted to explain the lack of accountability in the health system using a technology base.

4.3.1 Information technology adoption for improving HR in the health sector of South Africa

Kinanga (2013:16) explores the role of IT policy framework, IT implementation procedures, IT literacy and IT infrastructure as determinants to successfully adopting IT in the HR function of the health sector. Kinanga (2013) further notes that the adoption of IT has been hampered by several challenges such as: i) lack of a proper IT policy framework, ii) ineffective IT implementation procedures, iii) low levels of IT literacy, and iv) the lack of IT Infrastructure. These challenges are still hampering the effective adoption of IT in HRH.

Researchers have conducted several studies on IT adoption in HR in the health sector, yet its impact on the industry is still questionable (Gavurová et al., 2018; Taye et al., 2021; Pai,

Ganiga, Pai & Sinha, 2021; Arakelian et al., 2022). Interestingly, Arpaci, Yardimci, Ozkan, and Turetken's (2012:37) study on the adoption of IT in HR using the TOE model as a framework identified three key determinants that affect organisational adoption of IT in HR: i) technological, ii) organisational and iii) environmental (which give rise to the acronym). Arpaci et al. (2012) further mentioned that the TOE framework developed in their study has been adopted in various sectors of the economy but requires further investigation to highlight the effect of the combination of HR and IT to achieve a better healthcare workforce sustainability.

Gliklich, Leavy and Dreyer (2019:1) think that HIT has progressed rapidly in the past years. The implementation of e-health records has become well known in hospitals and paramedic services, and a large amount of electronic health data is available for use in the archives for research studies. Further, the acceptance of IT in the healthcare system of SA has increased radically in the past years (Mahlulo, 2020:22). Thus, before the year 2009, healthcare systems used to depend on paper-based records systems, limiting workers' ability to share data with other healthcare providers and making research outputs unreliable in SA (Gliklich et al., 2019; Barrett, 2021).

One of the significant obstacles preventing the effective adoption of IT is the lack of interoperability between e-health, and other ISs in the health sector (WHO, 2018b). However, achieving the result of IT interoperability would require the health system to address the technical and organisational challenges related to the security of information. Williams and Ferguson (2021:35) report on the security and information consciousness that any organisation transferring electronic data is expected to have confidence and trust in the data being transferred. The data must be accurate and only authorised personnel should have access to it, which is part of the reasons for effective IT usage in healthcare.

4.3.1.1 Description of interoperability in the health sector

Interoperability is described by Gliklich et al. (2019:4) as "the ability of an IS to exchange e-health information and use of e-health information from other IS without special effort on the user's part". Essentially, for a health sector to be competitive, it needs to have ISs that can communicate with one another (Sligo, Gauld, Roberts & Villa, 2017; Oluwaseyi, Adebola, Nzechukwu & Oluwatofunmi, 2019). Gliklich et al. (2019:4) further indicate that the security challenges relating to interoperability are: i) ensuring that secure methods of moving data are available, ii) prevention of unauthorised or unintended altering of data, iii) validating the individual access to data and iv) appropriate permissions to work with the data.

4.3.2   Information technology and recruitment in the health sector

An effective IT system for recruitment can positively impact health sector improvement. Subsequently, Khadija and Omar (2019:123) indicate that technology improves the recruitment and selection process. Also, IT can provide job hunters with more possibilities for finding a job in the healthcare sector and, at the same time, assist governments in restructuring the hiring process in the industry.

An effective IT in the recruitment process allows the health sector to view and select their candidates from different sites on the internet such as CareerBuilder, Monster and Hot Jobs, Facebook, LinkedIn, Researchgate, and Experteer amongst others (Dixit, 2016:5). Khadija and Omar (2019:123) concur that using IT in the recruitment of skilled healthcare personnel can yield several results: i) IT will be expedient in the recruitment process because it will provide a better result than the traditional approach; ii) it will enhance the worth of recruitment when using IT in the process; iii) there will be a trivial enhancement in communication when IT is used in the recruitment process rather than the traditional approach and iv) IT in the recruitment process will be much more effective than the traditional approach.

4.4   CYBERSECURITY AND INFORMATION TECHNOLOGY IN HEALTH SECTOR

Information technology and security in the health sector are some of the major issues that have to be observed when it comes to patients' data, the workforce, and the entire sector. The health sector has always handled data and information such that patients' and workers' data was not kept secure, which could be prone to misplacement or even get into the hands of hackers (Askar, 2019:237). Askar further mentioned that e-health record systems in the healthcare sector have not improved in the 21st century, which has negatively affected health services.

Zaman, Radu, Răpan and Berghea (2021:126) describe cybersecurity as a security blunder that makes the use of the IT system in the present day more prone to danger and challenges. Practically, even with the risks and challenges in IT security, the strategies of cyber-attacks are still effective in the health sector and the need to focus on data security within the health sector to secure employees' and patients' data is essential.

Wasif et al. (2021:57:1) maintain that cybersecurity is a creativity problem with concerns on healthcare tasks, not just for the IT unit but for the entire healthcare sector. In other words, it is essentially about the patients and the workforce's continuous healthcare delivery. Perhaps

cybersecurity is not only a problem for IT but also a growing delinquent across all sectors including healthcare and engaging them in a mission that is beyond technology.

Chua (2021:229) identified five threats that cybersecurity culprits present in gaining access to health information:

- **Email Phishing:** an attempt to trick somebody into giving out log-in or other sensitive details using email.

- **Ransomware:** a type of malware (malicious software) that is distinct from other malware in an attempt to deny access to a worker's data, usually by encoding the data with a key known only to the hacker.

- **Loss or stolen equipment or data:** lost or stolen mobile devices such as laptops, tablets, cell phones, and USB drives end up in the hands of hackers.

- **Insider, intentional or deliberate data loss:** insider terrorisation exists within every institution where workers or other IT users access the health sector technology substructure, network, or databases.

- **Attacks against connected medical and workforce devices:** phishing attacks that affect a file server connected to a heart monitor; while scanning the network for devices, the attacker takes control of all heart monitors in the Intensive Care Unit (ICU), putting the data of the patients and the workforce at risk.

Therefore, there is a need to have a rich set of meaningful information and alternate action plans. Such a plan could include using IT drives to identify staff with higher cybersecurity risk profiles for personalised on-the-job information resourcefulness by using more sophisticated predictive and prescriptive IT solutions to safeguard the sector (Etukudo, 2019; Bhargava, 2021).

Thus, the lack of security of skilled workforce confidential records in hospitals could be attributed to poor data security, lack of privacy, legal issues and the unavailability of network and IT infrastructures (Gathungu, 2018). Khumalo (2017) also emphasize that the application of IS in healthcare administration brings about privacy and confidentiality, as it is critical to health workforce information safety. However, data security in some healthcare facilities remains fragmented and is of poor quality because of limited disaggregation of data by the health department. Perhaps there is a need for continued strengthening to support data security issues in the health sector (Zapata et al., 2021). Kankaew (2021) also argues that HRIS usage should ensure adequate data security while managing employees' information within the health sector because it is concerned with employees' personal information.

4.5 HEALTH INFORMATION SYSTEM AWARENESS IN SOUTH AFRICA

The introduction of IS has created a different ideology in the health sector. The effects of decentralisation of the Health Information System (HIS) in Africa resulted in a high rate of transference of government jobs in the continent of Africa (Manya et al., 2018; Lin & Kujabi, 2022). Consequently, this caused a weakening in the management of the system by governments' poor decisions and the fact that governments prefer to invest more in visible infrastructural projects like buildings and ambulances than in IS, which is a big challenge. Zareravasan and Alizadeh (2021:55) highlighted the need for proper coordination and collaboration between the provincial and national governments and among vendors, researchers, policymakers, healthcare facilities, clinicians, and patients for the effectiveness and adequate awareness of HIS in countries like SA.

Orakzai, Ansari, Ahmed and Hussain's (2017:258) study on HIS awareness among two healthcare sectors indicated that HIS awareness is better in private and international hospitals than in public hospitals. This is due to the overcrowding of patients, insufficient workers, lack of an effective monitoring system in the latter, and a lack of coordination among the ICT specialists. There is an indication that the HR and IT workers that deal with the HIS database are some of the most critical staff. Any mistakes made by them in capturing data will affect the authenticity of the data produced for decision purposes.

4.5.1 Definition of health information systems

Lippeveld, Sauerborn and Bodart (2000:3) define HIS as "a set of components and procedures organized to generate information which will improve healthcare management decisions at all levels of the health system". AbouZahr and Boerma (2005:579) also define HIS as an "integrated effort to collect, process, report and use health information and knowledge to influence policy-making, programme action and research". A further definition of HIS was from Haux (2006:270) that HIS is "that system in which collection, utilisation, analysis and transmission is done for conducting health services, training and research". Perhaps these three definitions describe HIS as "a comprehensive, integrated IS designed by hospitals to manage all aspects of hospital operation such as medical, administrative and financial processes" (Orakzai et al., 2017:258). Ideally, HIS provides hospitals with the information required for observation, evaluation, supervision, and control. However, it also integrates all procedures of healthcare services in coordination with networks and reports to ascertain accurate information (Deharja et al., 2020:381). Thus, HIS is designed to collect and report on data used by hospital facilitators to plan, monitor and evaluate the performance of their responsibilities, which if not trusted will affect the authenticity of the data and their final reports.

4.5.2   Strengthen of health information system in South Africa

A WHO (2017b) report on the strengths of HIS in Africa highlights a resolution calling for action to improve HIS and ICT for service delivery in the health sector of countries like SA. The WHO (2018b) report identified some of the challenges that are associated with poor HIS in Africa, as follows: i) delays in submission of reports from hospitals and programme managers, ii) duplication of data, iii) incomplete health records, iv) the inability of HIS to exchange electronic information, v) lack of trained personnel for specialised fields, vi) resource constraints, vii) limited budgets, viii) external influence on stakeholders and policies, and ix) the inability to generate reports and administrative burden on the workforce. Essentially, there is a need to investigate how to improve the use of HIS and ICT in the health sector for better and more efficient service delivery (Thaiya, Julia, Joram, Benard & Nambiro, 2021).

Tull (2019:2) believes that countries have engaged in supportive actions to solidify healthcare systems by joining resources with other countries to create a stronger HIS. These results are in line with a WHO report (2018b), which indicated the need to improve the use of HIS in the health sector for effective service delivery, which will require a combination of resources to achieve. Rafferty et al. (2019:26) highlight that for an effective HIS to be in place, specific procedures have to be adhered to with legislative regulations such as: i) health spending control, ii) refining collective actions and relationships, iii) steering system advances, iv) solidifying service monitoring, v) knowledge sharing and vi) strengthening the workforce.

4.5.3   Demand for equal access to the health information system in South Africa

Access to and the ability to elevate HIS standards in SA has been in the spotlight for a reasonable period (Ntsala & Dikotla, 2019:623). Poor people in rural areas do not have equal access to HIS due to social and economic factors. Also, most LMICs in Africa are still struggling to provide equal access to HIS for their people. However, equal access to HIS can be improved in 6 different ways, namely: i) identification, ii) availability, iii) price to the user, iv) cost to the provider, v) cognitive access and vi) acceptability (Lippeveld et al., 2000:16). Perhaps there is a need for patients and workers in the SA public health system to have access to services through an IS to meet the WHO's Sustainable Development Goal by the year 2030 on technology advances (Condrey, 2014:386).

4.5.4   Factors influencing health information systems in South Africa

Various factors can influence HIS in SA. For example, sound and reliable information are the foundation of an effective HIS (Wright et al., 2017). Without sound and reliable information, HIS will not be effective. However, making decisions across all health systems with equitable structures would include: i) service delivery, ii) health workforce, iii) health information, iv) medical products, v) vaccines, vi) technology, vii) finance, viii) leadership, and ix) governance. Unfortunately, Kuyo et al. (2018:54) highlight the main challenges hindering the adoption of HIS usage as: i) lack of management support, ii) poor skills among the users, iii) lack of adequate computers, iv) unreliable internet connectivity, v) lack of power backup, and vi) resistance to change. Abbas, Richardson and Carroll (2019:2) propose the need to find out the decision-making factors and theories in adopting HIS for workforce retention context.

Many factors in the IT setting affect the HIS user performance. These factors include: i) the frequent use of IS, ii) quality of the IS, iii) quality of data, iv) IS efficacy, v) ease of use, vi) task technology, and vii) user satisfaction (Maamari & Chaanine, 2018:63). The latter further noted that users and task characteristics are the most recurrent autonomous controlling variables affecting users' HIS performance in the health sector. Zareravasan and Alizadeh (2021) support Maamari and Chaanine (2018) in their study, which found that factors that affect HIS are: i) HIS user interface quality, ii) HIS functionality, iii) project management, iv) procurement and v) user's previous experience. Furthermore, Zareravasan and colleagues mention that HIS structures have concerns around issues such as: i) privacy, ii) patients/workforce safety, iii) patient/workforce relations, iv) staff nervousness, v) time factors, vi) healthcare quality, vii) finance, viii) efficiency, and ix) liability. These identified issues could be consequential to the effectiveness of HIS in SA.

An exciting result of Zareravasan and Alizadeh's (2021) study is that HIS has not been the source of adverse events. The source of adverse events is linked to errors that are associated with IS processes. Ahmadi, Nilashi, Shahmoradi and Ibrahim (2017:161) also identified other factors that influence HIS adoption as: i) relative advantage, ii) compatibility, iii) security anxieties, iv) size of the hospital, v) imitative pressure competitors, vi) vendor support, vii) perceived technical competence of IS workforce, and viii) employees IS knowledge. Therefore, further study is needed to develop an integrated framework that adequately predicts the HIS adoption.

4.6 DIGITALISATION OF HEALTHCARE RECORDS IN SOUTH AFRICA

The digitalisation of healthcare records in SA is still a slow process. Gathungu's (2018:39) study on the influence of digitisation of healthcare records in hospitals notes that data insecurity and lack of confidentiality influence electronic healthcare records' adoption. Legal matters, network and infrastructural crises are other noteworthy factors affecting the digitization of health records. Kocsi, Pusztai and Budai (2019:248) also mention that for influential electronic healthcare records to be in place, there must be proper communication between key players in the process of: i) having the available technical staff to install these systems, ii) there has to be a reasonable cost of electronic healthcare records required, and iii) there must be adequate infrastructure available to digitalise the record system.

According to Gavurová et al. (2018:3), the effective digitalisation of healthcare IS should be applied. Unfortunately, the applications in the health sector are limited due to the unavailability of sufficient computers. Perhaps digitalisation allows the effective use of hospital assets to improve healthcare provision's overall quality. However, Guthmuller, Paruolo and Verzillo (2021:14) propose a European Union (EU) eHealth action plan on sustainability in the health system for the year 2012-2030. The eHealth action plan aims to improve interoperability and calibration of cross–border exchange of data access, including telemedicine services and effective IS, to allow workers access to an accessible and resilient health system.

Interestingly, Sy (2018:146) states that some of the most significant challenges of eHealth development in African countries are that the population are reluctant to accept changes to digitalisation, and their reluctance causes a delay in the transformation from manual to an electronic system. Also, the effects of unreliable network providers are part of the stumbling blocks. Essentially, Mahlulo (2020:4) indicates that digital change could have an impact on both the patients and workers in such a way that if effectively implemented, there would be an easy flow of data entry and records which would create an eHealth system implementation success in SA.

4.6.1 Digital Health Systems transformation in South Africa

The health systems transformation from analogue to digital in the African continent is being done at a slow pace. Marcelo et al. (2018:1) report that ICT health, also known as digital health, could fast-track health system transformations to better quality, efficient, and accessible patient care. The WHO has recognised the digital Health System (DHS) as a critical structure for UHC and SDG in health. Many countries are promoting interest in transforming the health systems in areas such as digital disease surveillance systems,

electronic medical records, social health insurance payment processes, and workforce IS (Marcelo et al., 2018; Mofolo, Heunis & Kigoz, 2019).

Coincidentally, Muinga et al. (2020) support the findings of Marcelo et al. (2018) as they emphasised that the adoption of DHS in the health sector is geared towards improving the administrative workforce and patient care. Perhaps the aim has been to provide health management with compelling data on the DHS settings and support the speedy development of digital health in the community through knowledge sharing. However, the users of DHS are confronted with some challenges such as: i) poor system usability, ii) inadequate training, iii) poor infrastructure, and iv) system support, while the suppliers are confronted with: i) insufficient funds, ii) prioritisation of services, iii) lack of confidence of users in the new technologies, and iv) the lack of suitable data sharing policies (Muinga et al., 2020:6).

In previous pandemics, various digital health strategies have been used to control pandemics and the workforce. Some of the pandemics are: i) Middles-East respiratory syndrome, ii) severe acute respiratory syndrome, iii) H1N1-flu, and iv) EBOLA (Gholamzadeh, Abtahi & Safdari, 2021:2). During those periods, a team of IT specialists came together and invented an intelligent tool called ID-Viewer as a decision-making system to predict communicable outbreaks and to control the workforce required to deal with the pandemic. Despite these tools, the situation of pandemics and workforce shortage is still a crisis to deal with. Thus, Zaman et al. (2021:120) remark that digital healthcare services bring substantial benefits in the coming decade. Also, many people will have access to healthcare assistance regardless of the location. But currently, the digital health system is still not accomplishing its purpose in the health sector.

Fundamentally, Rafferty et al. (2019) identified a group of European Observatory DHS and policies to support and promote signal-based health policy-making through an inclusive and rigorous health system analysis. This initiative brought a wide range of policymakers, academics and health practitioners to analyse trends in health restructuring and draw experience from across Europe to illuminate policies relating to the DHS. Long, Pariyo and Kallander (2018:S45) also point out, based on the procedures relating to DHS. Interestingly, the WHO introduced guidelines using the International Telecommunication Union (ITU) to nurture and maintain health systems development reasonably. Yet, progress regarding such guidelines is to be achieved in the healthcare sector. But unfortunately, according to Moore, Werner, BenDor, Bailey and Khan (2017:48), disjointed applications of the DHS often duplicate perpendicular strategies to supporting health workers in a more traditional training process.

4.6.2 Resource allocation in the digital health system in South Africa

Resource allocation in digital health is of great concern. According to Kocsi et al.'s (2019:244) study on the new approach to resource allocation in digital healthcare, they mentioned that the digital automation process in the healthcare system aims to reduce patient travel and waiting time. Perhaps it will assist in increasing the use of medical equipment and monitoring patients' and workers' records through a digitalised records management system. Surprisingly, the patient waiting time has played a significant role in the total process time of patient care. The main reason for such a problem is the lack of sufficient resource allocation (Paul, Ndiaye, Sall, Fecher & Porignon, 2020:6). Ideally, IT solutions are expected to be used to reduce risks and improve patient satisfaction in the health sector. Thus, digital health automation could offer a fast and efficient solution to the decision-making process requiring an effective resource allocation (Gebre-mariam, 2018:26).

Although most healthcare facilities are now in abode to deliver UHC using a DHS, Perhaps the identified problem is the reduction in the progress of UHC. Thus, this problem is characterised by the difference in resource allocation in the health sector. However, the situation has affected the rest of the health system, including service delivery results (Paul et al., 2020:2). Also, Marcelo et al. (2018:3) signify that patients and workforce records can be more centred on the increased use of ICT in DHS resource allocation. Coincidentally, digital health allocation can transform record keeping, data sharing and usage; by augmenting interaction between patients and workers and improving service quality with more efficient resource allocation while lowering healthcare costs.

4.6.3 Factors that affect the digital health system in South Africa

A well-functioning health system requires a virtuous DHS as a basis that is needed to coordinate stakeholders and policies that will enable an effective health system. However, Marcelo et al. (2018:1) mention that the two factors that affect the growth of digital health systems are: i) lack of access to ICT at the initial stage of the implementation and ii) the lack of adequate health systems that are growing and maturing. Surprisingly, if properly diagnosed by the health sector in countries like SA, with systems in place to effect growth, these factors would have progressed in its digital healthcare system (Long et al., 2018:S46).

4.7 HRIS IN THE HEALTH SECTOR OF SOUTH AFRICA

HRIS is a software solution for data entry, data tracking, and information needs of HR which includes; payrolls management, recruitment and selection, training and development functions

within an organisation (Anupa, 2021:24). However, there are different types of HRIS software packages and come in other modules that depend on the organisation's demand and what they can afford (Papa, 2016:75). Surprisingly, numerous studies on the use of HRIS in healthcare exists, yet there is still a lack of evaluative research that raises unanswered questions about their capacity to improve its quality and efficiency (Spero, Mcquide & Matte, 2011; Dilu et al., 2017; Kiros, 2018; Al Shikhy, Makhbul, Rawshdeh, Arshad & Ali, 2019; Chakraborty & Khan, 2019; Valcik et al., 2021). Essentially, it enables learning in healthcare systems and how socio-technical complexity influences the use and effectiveness of HRIS (Tursunbayeva et al., 2017:1). Also, Ali et al. (2021:6793) highlight that HRIS is regarded as the best practice in the health sector and that HRM technological practices are essential for delivering effective healthcare services in hospitals. Ideally, particular emphasis should be placed on HR management of skilled health workers, which will require the effective use of HRIS in health. Interestingly, Nagadeepa and Shaji (2021) argue that the main focus of HRIS in most organisations is on information relating to payroll administration, remuneration management, positions, job descriptions and personal profiles, which are related to administrative functions.

4.7.1   Standardised HRIS in the health sector of South Africa

Globally, the lack of effective use of standard HRIS in the health sector has created a backlog in the growth of the industry in most African countries (Troshani et al., 2011; Esanga et al., 2017; Were et al., 2019). However, Waters, Zuber, Simbini, Bangani and Krishnamurthy (2017:4) identify the lack of a global standard to utilise HRIS to improve the data captured and strengthen health workers' regulation and deployment. Essentially, there was a lack of proper guidance in the development of HRIS and standardisation for planning and decision-making for the health workforce in countries in the Southern African region, which was why HRIS in health has not been effective (Chugh, 2014:150).

A review of HRIS conducted by Riley et al. (2012:1) on HRH in Africa showed that most countries report their capability to deploy health workforce supply and the effective use of IS such as HRIS in the health sector. Only a few IS are documented as being used for HR planning and decision-making. However, there was no indication of effectiveness in the use of HRIS in the health sector in countries such as SA. Practically, the drivers for a standard of HRIS in health include: i) the health sector national culture, ii) national institutions, iii) national business systems, and iv) the subunits themselves (Yao, Fan, Guo & Li, 2014).

Ideally, Ngwenya et al. (2019:2) contend that HRIS can contribute to a reduction or elimination of joblessness within the health sector. However, this can be done by ensuring that hospital

processes conform to highly reliable data standards, ensuring employee satisfaction and health sector HR departmental efficiency. Therefore, there is a need to ensure that HRIS vendors are providing standard HRIS software solutions and provide predictive analysis for future growth in the use of HRIS in healthcare is very important (Das & Barman, 2018:1).

Riley et al. (2012:1) also indicate an absence of standard HRIS in the health sector. We are made to understand the need to have the availability and quality of information that can be used to support effective and efficient HRH, strategies and investments at the national, provincial and local levels of government of SA (Riley et al., 2012; Were et al., 2019). Furthermore, there is a need to further research to be conducted on how to have a standard HRIS to support effective HRH systems in the health sector.

4.7.2   HRIS functionality and staff retention in the health sector of South Africa

HRIS functionalities are usually regarded as the system's software. Most researchers have attempted to find reasons why the health sectors do not have effectively customised HRIS functionality for the health sector of SA (Udekwe, Iwu, de la Harpe & Daramola, 2021b:265). Perhaps there is a need to identify specialised HRIS functions that will improve the retention of the health workforce (Witter et al., 2020; Ntirandekura, Friday, & Muhammad, 2022). The WHO conducted an HRIS functionality requirement analysis and developed a standard HRIS functionality called Minimum Data Set (MDS) for the global health workforce registry (WHO, 2015; WHO, 2020). However, further investigation found that most African countries, including SA, do not use MDS as part of the HRIS for effective workforce management in health (Mahlathi & Dlamini, 2015; Waters et al., 2017). This warrant developing an HRIS for healthcare with a list of prioritised functionalities to be approved and recommended by the global standard for the health sector. However, such prioritised HRIS functionalities do not prove an effective HRIS in the health sector (Martiniuk et al., 2019; Mahlulo, 2020).

Essentially, Beulen (2009:270) mentions the contribution of HRIS to staff retention in the emerging market of the health sector, and that HRIS should be supplemented with local adaptations to achieve the best support for staff retention and management. However, staff retention in the health sector in a developed country shows that unfavourable remuneration is one of the significant reasons for skilled health workers' decisions to quit their jobs. Still, it is not the most critical reason. Perhaps most people believe that the lack of effective HRIS for the proper management of employees could be blamed for low worker retention (Perry & Hodgins, 2021:5). However, there are other reasons apart from remuneration that makes skilled health workers quit, such as: i) growth prospects, ii) inspiring workers, iii) training and

development opportunities, iv) well-equipped work locations, v) flexible working hours, and vi) the chance to work with the newest technologies (Beulen, 2009:271).

4.7.3   HRIS on e-recruitment technology in the healthcare of South Africa

The effect of HRIS on e-recruitment technology in the health service has not been effectively implemented in SA. However, there have been attempts to measure public health e-recruitment efforts across all levels of government, but they are yet to be accomplished (Jabbar & Khurshid, 2020:85). One of the major problems encountered by the study on e-recruitment is the significant difference between the arms of government and their participation in using HRIS for recruitment purposes (Wesolowski, 2016).

Interestingly, Wesolowski (2016:17) emphasized that "96% of the recruitment in the developed countries' healthcare are internet-based compared to countries like SA which is of great concern". Wesolowski (2016:134) recommended that HRIS e-recruitment technology can provide the health sector with an exceptional range of functionalities which include integrated social networking modules, and a web-based identification of priority candidates module. Thus, e-recruitment could impact the use of HRIS in the health sector of countries like SA if effectively utilised.

4.7.4   HRIS strengthening process in the health sector of South Africa

A study conducted by Tursunbayeva et al. (2015:2) on the strengthening of HRIS in the healthcare sector emphasised that HRIS can improve healthcare functions through workforce planning, staff training, management of analytics, and financial and operational administration if effectively utilised. Essentially, Tursunbayeva et al. (2015:2) show that 65-80% of the healthcare budgets go to HR. However, there is a need for a successful HRIS in the HRD to improve in-patient care and service delivery. Spero et al. (2011:1) emphasise the use of HRIS to track and monitor the health workforce, which shows that health workforce planning is essential for recruitment, training and deployment of employees in the most efficient way and could assist in strengthening the HRIS in the healthcare. Perhaps there is the notion that SA does not make use of HRIS for recruitment and other relevant HR functions, and this is one of the reasons why the strengthening of the health sector in SA will require the use of HRIS for effective health. According to Laurenzi (2020:15), in the 1970s, many South African healthcare programmes were operationalised by non-governmental actors that attempted to provide more equitable care. Healthcare budgets were under-allocated and often misappropriated due to a lack of technology usage in the preparation of budgets in the public health sector of SA. Perhaps the lack of sophisticated technology such as HRIS to manage

health workers makes it difficult to have accurate health-specific budgets (Lei, Liu & Li, 2021:12).

Using HRIS in decision-making and organisational performance by the health sector in countries like Kenya shows that the shortage in the health workforce is attributed to the demand for medical professionals in response to global health issues (Maruru, 2014:6). Also, the lack of an adequately skilled workforce and the poor distribution of health resources are part of the reasons for poor decision-making in the sector. This affects the strengthening and organisational performance in the health industry. However, Shipalana (2019:796) maintains that the use of HRIS assists in providing information for effective policy and planning and aims to evaluate the quality of data and to influence and strengthen the decision-making process in the health sector. There is, however, a need to conduct further research to identify proper IT infrastructure and equipment in maintaining skilled personnel to support the use of HRIS for organisational performance.

Incidentally, various HRISs have been used in the health sector to achieve nursing management objectives through a review of decision support systems (DSSs) (Akram, Hassan, Hamid, Alireza & Reza, 2019). However, Akram et al. (2019) mention that HRISs have assisted in achieving: i) a lower nursing workload, ii) determination of the ratio of nurses to patients, iii) shifting management, and iv) the management of costs, yet there is no centralised and consistent database of nursing professionals. Thus, there is a need for more research on the use of HRIS to centralise nursing information to provide for the needs of the health sector.

According to Ngwenya et al. (2019), HRIS focus is centralised by the highest authorities. The workers' information is derived from inter-reliant departments in the public sector, which often makes the retrieval of workers' details complicated in SA. However, the South African health sector is facing an increase in healthcare costs, due to advances and development in technology and an increase in demand for competencies in technology. Also, the use of centralised HRIS structures could work well with new developments to produce quality and efficiency with fewer interventions in the health services (Blštáková & Palenčárová, 2021). Furthermore, Sligo et al. (2017) believe that in some developed countries, their public health system is centralised, but still faces numerous complications and frequent changing in structures in their health systems. Sometimes there is difficulty and shortage in supply of healthcare services even though they have a centralised health system. Despite the centralised system, there are still inefficiencies in the healthcare workforce supply that create unsatisfactory delivery of health services in countries like SA (Malakoane et al., 2020).

4.7.4.1 Steps to take in strengthening the health workforce using HRIS in South Africa

Using HRIS makes a significant impact on healthcare to enhance competitive advantage (Kiros, 2018:12). Spero et al. (2011:3) identified 6 steps that could assist in strengthening the health sector using the HRIS: i) building HRIS leadership stakeholders, ii) strengthening ICT infrastructure, iii) developing an HRIS software solution, iv) promoting a culture of evidence-based decision-making, v) building HRIS capacity, and vi) ensuring data quality and security. However, Matsiko (2019:61) suggests the need to conduct further research to identify ways that IS such as HRIS could be synchronised to improve the strategic HR planning process in place for healthcare. Also, Chumo (2014:1) studied strengthening HRIS and staff development in an NGO and remarked that most NGOs had implemented HRIS in HRM with their main focus on staff development. However, they did not fully exploit the potential of using HRIS due to a lack of funds which deprives their aim of using the system.

There is still the problem of scarce skills in the health sector. The need to ensure an ongoing supply of trained health specialists and retention of skills in the health sector is required to strengthen the health sector using efficient HRIS tools effectively. However, Wall and Vienings (2017) contend that SA does not have sufficient skills to plan, operate, build and maintain service delivery in public institutions. Some of the primary reasons are the lack of skills to manage health services and the lack of advanced HRIS to identify the available positions in the various sectors of the economy, most especially health. There are also challenges with transport, water and sanitation, and education as well as healthcare.

4.7.5 Resistance to change in the use of HRIS in the health sector of South Africa

Resistance to change in HRIS in the health sector is a significant challenge. The entire skilled health workforce needs to be involved in improving the HRIS for public healthcare in SA, for the achievement of Vision 2030 on health workforce sustainability by WHO (Al Shikhy et al., 2013; Alhazemi, 2017; WHO, 2021c). Al Shikhy et al. (2019:566) are in line with Al Alhazemi (2017) in indicating the strategic objective of using HRIS to improve effective governance by developing an e-government that is focused on the use of HRIS in the public health sector, as a priority in building a modern technology in hospitals. This will require additional funds and other resources to be allocated to the health sector for such a change to be implemented.

Essentially, resistance to change is caused by 5 critical factors that influence decisions to adopt HRIS in the health sector. They were identified by Alam et al. (2016:1) as: i) poor IT infrastructure, ii) lack of top management support, iii) poor IT capabilities of staff, iv) perceived cost, and v) competitive pressure. Ideally, a successful HRIS can produce outputs that meet

users' expectations with less cost and effort. It can assist in the encouragement of staff retention, but the such achievement will be dependent on the expectations of the organisation involved (Arini & Bangun, 2014; Pouransari et al., 2016). Thus, there is a need to conduct further research on how hospitals and governments can improve the possibility of adopting HRIS to enhance changes in the health sector in general.

The HRIS could assist in replacing paperwork but at the same time establish resistance challenges, where some workers get frustrated with extra administrative tasks. Employees need guidance and motivation to adapt to new system implementation (Scupola & Pollich, 2019). Additionally, other factors that cause resistance to change in the health sector are the extra workload in performing functions outside their regular work, stress, staff shortages, and unsafe working conditions. Some workers might not be keen on accepting the changes in technology and infrastructure (Iwu et al., 2012).

4.7.5.1 Data standards in HRIS as resistance to change in the health workforce of South Africa

In a study conducted by Settle, Lwetabe, Puckett and Leitner (2014:1), they pointed out that United States Agency for International Development (USAID) attempted to familiarise other countries with implementing an HRIS that can assist in tracking health workers' data. Also, Bayraktaroglu et al. (2019:48) believe that HRIS is valuable to the extent that the users are comfortable with the policy and management reports, which can only be efficient if the data captured is accurate, which leads to better healthcare information.

Data standards in HRIS can also be part of the transformation in the mindset of health workers for acceptance of change in the sector. Settle et al. (2014:6) further came up with 5 key commendations to promote data quality through the use of HRIS: i) regulate data to ensure consistency among different systems, ii) link HRIS with the recognised HIS so that all systems can aggregate and produce the same data, iii) consider global standards so that HRH information can be linked at the regional and global levels, iv) engage with HRH stakeholder heads and other key collaborators who have the skills to manage and create HRIS and standards, and v) build on the ability of data users. including members of stakeholder government so that they are well placed to successfully analyse and make good use of HRIS data when needed (Settle et al., 2014). Thayer et al. (2021:7) concur that resistance to change in the health workforce can be avoided if there is a proper understanding of the implementation of HRIS and other HIS with data accuracy.

4.7.6 The challenges of using HRIS in the health sector of South Africa

The lack of effective use of HRIS in the health sector poses a significant challenge to the sector's efficiency. Interestingly, Matimbwa and Masue (2019:131) indicated that HRIS could be useful in the HRD mainly for: i) recruitment and selection, ii) updating and maintenance of employee data, iii) generating HR reports, iv) employees' deductions, v) direct deposit distributions, vi) career planning, vii) self-service technology, and viii) training and development. Incidentally, Dilu et al. (2017:2) state that though there is the usefulness of HRIS in healthcare, the sector still faces challenges in using the HRIS such as: i) unsteady financial capacity to acquire HRIS and update and maintain the HRIS, ii) inadequate ICT and HRIS proficiency among the HR workforce, iii) inadequate coordination of government mechanisms in the performance of their legal tasks, iv) instability of internet connectivity and v) inadequate top management support.

However, Makembo and Oluoch (2018) indicate that the use of old HRIS is a challenge that negatively affects the performance of organisations and the need to introduce a more modernised HRIS structure to meet the demand of the workers in SA is critical. Furthermore, Palagolla and Wickramasinghe (2013) indicated that using an HRIS which is still a Disk Operating System (DOS) version, will prevent an organisation from stepping ahead of its close rivals to achieve a competitive advantage. Gebre-Mariam (2018) believes that using non-web-based HRIS hinders regular upgrades, and the use of primitive systems is costly and prone to bureaucratic delays in HR processes. Perhaps primitive HRIS makes the work of HR difficult and the workers unhappy.

Deussom, Jaskiewicz, Dwyer and Tulenko (2012) and Jayeoba, Aremo, Fapohunda, Genty and Bankole (2020) proposed an electronic monitoring system for worker absenteeism in the health sector of which the effect is yet to be accomplished. Furthermore, Parikh (2018) highlighted the use of HRIS to identify and monitor workers' knowledge, skills, and personal attributes for superior performance, which an old system cannot perform.

Maruru (2014:9) made recommendations to resolve the health sector challenges regarding HRIS. He suggests that government should increase budget allocations to ensure the adequate improvement of health facilities and the development of a skilled health workforce in the country. He also applauds the reinforcement of coordination between different health departments responsible for HRIS management. A further recommendation was to speed up information flow to system users for complete and accurate output and timely updating of employee information (Maruru, 2014). However, these recommendations are insufficient to measure the effective use of HRIS in the health sector. Thus, there is a need to look into other

reasons that will better understand how to use HRIS to improve healthcare delivery through workforce retention (Prasad, 2020:26).

4.7.7 Collaboration on the use of HRIS in the South African healthcare system

Countries and healthcare departments need to collaborate on using HRIS for better learning and efficient processes. However, in a study conducted by Were et al. (2019:1) on the success of some African countries, including SA collaboration on the use of HRIS in health, they realised that the main factor limiting the achievement of health and development goals is the shortage of health personnel. Those countries are encouraged to develop evidence-based strategies to scale up their health workforces to bridge the scarcity gap (Okwang, 2020:8). Were et al. (2019:2) also mention that WHO (2013a) found a global shortage of about 7.2 million healthcare workers, of which 25% are in Africa. To resolve these shortages would require the need for effective communication strategies, collective planning, teamwork, readiness to learn, and effective collaborative engagement among different health sectors with regard to HRIS skills (Were et al., 2019; Navajas-romero, Ceular-villamandos, Perez- Priegol, & Caridad-Loʹpez del Rıʹo, 2022).

4.7.8 Adoption of HRIS in the healthcare of South Africa

There is a reliable understanding of the effective adoption of HRIS in healthcare, and this was identified by Quaosar (2018:133) in a study using the UTAUT model. The latter identified some of the factors affecting HRIS adoption in healthcare of SA as follows: i) performance expectancy, ii) effort expectancy, iii) social influence, iv) facilitating conditions, v) employee involvement, and vi) training support. However, these factors substantially impact HRIS adoption, although there is a dearth of research on HRIS adoption in the SA health sector (Mathews, 2017; Randle, Coleman & Kekwaletswe, 2017). Aksoy and Sallam (2018:36) emphasize that employees involved in using HRIS in healthcare development are essential in ensuring the effective use of HRIS.

According to Puspitarini, Handayani, Pinem and Azzahro's (2018:23) study on the introduction of the TOE framework on innovation, there could be a success in adopting HRIS in government departments. However, Mukherjee, Bhattacharyya and Bera (2014:5) indicate that the effective adoption of HRIS is viewed as a perceived benefit in the health sector in terms of HRIS knowledge, expertise and top management support. It could also serve as a decision-making tool for the HR management, hospital managers and the health sector, in general, to improve their worker's effectiveness and efficiency. Also, Gandolfi (2015) notes that the functional objectives of the person in charge of HRD, such as the Directors in HR, could be

held liable for non-compliant IT use in the HR department due to a lack of decisions that could affect such changes in the use of HRIS.

Additionally, Phahlane (2017) indicated that the lack of incentives and motivation could hinder the adoption of HRIS where the non-HRIS users might have no interest in accessing the system. However, the extensive use of HRIS can be considered essential and needs to be applied in all aspects of daily tasks. Furthermore, Padarath et al. (2003) and Kumler, Verhoogen and Frías (2013) believe that rewards, incentives, and award programmes have been shown to work effectively as motivating factors that the government has used to improve the retention of some level of health personnel. However, these motivating factors are yet to be adopted in using HRIS in the health sector. Therefore, Okolo and Iruo (2021) recommend that the service condition in the use of HRIS should be improved through an effective adoption strategy.

4.7.8.1 Factors that influence the adoption of HRIS in the health sector of South Africa

Researchers identified various factors that influence the adoption of HRIS in the health sector (Troshani et al., 2011; Alkhowaiter et al., 2013; Khan et al., 2015; Alam et al., 2016; Aksoy & Sallam, 2018; Kiros, 2018). Alkhowaiter et al. (2013:40) identify the following factors that influence the adoption of HRIS in the public health sector using the UTAUT framework and the DeLone and McLean IS model: i) issues relating to shifting the role of HRM from transactions to strategy, ii) issues relating to increasing competitiveness through development and enhancement of HR activities and procedures, iii) issues relating to re-engineering the entire HRM department and iv) the problem of creating a more excellent range of HRM reports. Additionally, Scott, Dinginto and Xapile (2015) state that one of the deterrent factors of HRIS is that leave records are mostly unreliable. The outstanding leave days and entitlements were found not to be updated, not captured, or lost in transit. Further, Marutha (2011) believes that poor record-keeping is a factor that affects the health sector of SA. These results in missing and lost documents, leading to delays in services rendered caused by a high level of paperwork, no proper filing system, poor planning, poor supervision, and lack of experienced users.

Mahlulo (2020:16) is in line with Alkhowaiter et al. (2013) in identifying the following factors that influence the adoption of HRIS in the health sector. The first is the **organisational factor** representing healthcare factors that influence the adoption of HRIS, such as technological competency of the health workforce regarding HR knowledge, communication, and skills development. The **technical factor** is the second, which focuses on how technology can influence the adoption of HRIS in the health sector. The health sector's benefits are expected

to gain with the adoption of technology that will increase service quality and reliable healthcare. The third is the **environmental factor** which describes the area where the health facilities are located, also including government regulations, and supporting infrastructure. There is a need to conduct further investigation to identify other factors that affect the adoption of effective HRIS in the health sector of SA.

4.7.8.2 Challenges faced with the adoption of HRIS in health

There are numerous challenges faced by the health sector when adopting HRIS. However, some of the challenges, according to Murithi (2015:42) include: i) shortage of skills, ii) sustaining capital, iii) lack of support and commitment from higher authorities, iv) the difficulty in locating the appropriate IT programmers with knowledge of HR functions, and v) the lack of effective teamwork with other departments. Interestingly, Kiros (2018) supports Murithi (2015), stating that the effective use of HRIS in health is faced with challenges such as i) poor infrastructure, ii) poor network connection, iii) load shedding, iv) poor training, v) lack of government support, and vi) absence of constant professional support. Practically, these challenges could lead to HRIS not meeting the health workers' expectations. Thus, there is a need to investigate further to identify other challenges facing the adoption of HRIS in the health sector (Vanduhe & Awoh, 2015; Qaisar, Shahzad & Arif, 2018).

4.7.9   Government participation in HRIS and E-HIS in the health of South Africa

The participation of the government in the effective use of HRIS is critical to elevating the IS usage of healthcare in the country. In SA, the eHealth strategy report first published in 2012 indicated that government participation is required to acknowledge that the HRIS and other IS should be used to strengthen the public healthcare system in the country (Motsoaledi, 2012:6). However, Wright et al. (2017:51) researched e-HIS in public healthcare in SA and realised that the benefits of e-HIS have been documented. However, its practical use is still limited due to poor government participation in the health sector. Essentially, there is an indication that patients' and employee data in most health facilities in SA are still manually recorded in files. Perhaps data for monitoring and assessing purposes are handwritten by health workers in registers. However, only the data entered into e-HIS is analysed (Arasa, 2019:5). Thus, there are calls for more effective government participation in HRIS and HIS to improve the health sector of SA.

4.7.9.1 Government participation in change management and adoption of HRIS in the South African public health sector

Poor government participation has discouraged continuous research for the change process in the adoption of HRIS in health. Although change management is an inevitable circumstance that cannot be disallowed, there is a belief that HRIS operations could bring effective change in health (Yusif et al., 2019). Furthermore, Yusif et al. (2019:8) identified some themes as part of the solutions for a successful HRIS towards change management as follows: i) stakeholder involvement, ii) proof of acquired skills in a similar project, iii) availability of dedicated change agents at all levels, iv) pronounced change execution strategy, and v) training and development mechanisms towards utilisation. There is a need for the government to participate in change management and to acknowledge the themes mentioned above for effective HRIS.

Kiros (2018:18) mentions that the extent to which the health sector adopts changes in IT would determine the level of government participation towards success. Ideally, HRIS is an advanced automation process that the health sector could use to manage its scarce HR resources. However, there is a need for the government to be actively involved in resolving infrastructural and other related issues concerning the adoption of IT in the health sector. Kavanagh and Thite (2020:269) also claim that the government needs to develop a policy to train health workers on IS to elevate their attitude concerning the use of ISs such as HRIS. Perhaps there is a need for top management to be dedicated and committed to addressing the status of HRIS usage and give their support towards solving the critical problems surrounding the effective use of HRIS in public health (Alam et al., 2016:5).

4.7.9.2 Government participation in dealing with absenteeism through HRIS in the health sector of South Africa

Absenteeism in the health workplace has become a regular phenomenon in most public services in SA (Kovane, 2015). Although the government is not doing something about it, especially having an HRIS to monitor the process, the situation makes it more devastating to the economy and health services in general (Witter et al., 2020:6). Deussom et al. (2012:1) mention that it is difficult to hold health workers accountable for poor service delivery in government. They explain that this is due to absenteeism and the fact that absenteeism is a chronic, unexcused absence from work that adversely affects the workers' efficiency and limits the quality of the health services rendered in countries like SA.

Essentially, absenteeism is associated with a high cost on individual, organisational and economic levels. Efficient workers in the health sector of SA are given additional work and are

often forced to perform work that they are not qualified to do to make up for absenteeism (Ogundaini, 2020:147). However, the government needs to intervene in the process by introducing an electronic absenteeism monitoring system in the health sector (Deussom et al., 2012:2). This system could assist because many workers are absent without any consequences. This could discourage honest and hardworking people and cause them to leave for other jobs, which is of great concern to the health sector and government in general. Thus, there is a need to conduct further studies to identify how an HRIS can be used to monitor and control absenteeism in the health sector of SA for effective service delivery.

In countries like Canada, staffing in public healthcare is a top priority for the government to realise the change management process (Wesolowski, 2016:8). However, HRIS portals promote effective public service talent management in the public service commission. Furthermore, this HRIS portal assists the public service to maintain an educated and knowledgeable workforce and sets out merit-based standards for the government (WHO, 2021c). Practically, in ensuring recruitment processes such as staff hiring, there is a need to be fair in building and maintaining a competent public service by dealing with absenteeism through HRIS. According to Warui et al. (2015:46), the scenario is that most research literature on the effectiveness of HRIS in government departments is from developed countries, and a need to investigate the impact of government participation in change management through the adoption of HRIS in the health sector in Africa is relevant.

4.7.9.3 *Government actions on issues affecting the performance of HRIS in the health sector*

Government actions could affect the performance of HRIS at any given point in time (Khan, 2019:1). Fundamentally, the main focus in WHO reports and other related literature on HRIS performance is on the actions taken by various government departments to solve various problems affecting the performance of HRIS that were identified (WHO, 2018a). However, there is a need to review the amended health bills and acts relating to HRIS and identify their vision, mission, aims, and objectives for effective monitoring, evaluating, governance, and grievance systems for effective HRIS. Zaman et al. (2021:121) argue that for government to achieve the goals of having an effective HRIS to access high-quality healthcare IS, the HRIS should go through a restoration process on the mandate to deal with issues relating to HRIS improvements and possible ways to elevate the HRIS to improve the control by the government.

Matsiko (2019:2) mentions that the importance of HRIS in the management of the public health sector is critical because of how modern-day organisations are managed through the

use of telephone, and other computer networks, which have resulted in online recruitment, government, business and production sectors. Eboreime et al. (2017:1) propose implementing some action plans in this modern-day HRIS that will assist the health sector in creating a national policy that identifies more effective ways of supporting lower levels of government towards improving their health systems and results.

The devolution of government functions in HRIS is becoming widespread in developing countries. To better understand the system, they need to adopt a new web-based HRIS for effective IS in place in the public health sector (Manya et al., 2018:1). However, Tursunbayeva (2019:3) indicate that in the health sector of developed economies such as Canada, training modules offer a customised and personalised experience to the entire health workforce irrespective of their demographics. Thus, this situation could assist the government and the health sector to observe proficiencies in their job and track licences and certifications in real-time (Socha-Dietrich & Dumont, 2021:18). Ideally, this process assists the HRIS to have improved compliance with government regulatory requirements and accredited bodies without stressing. However, this process is still lacking in the health sectors of the African continent.

4.8   THEORETICAL FRAMEWORK

In identifying a research gap, research has to be conducted to determine the weaknesses in research through literature reviews and other investigation processes. The outcome will be explained through a conceptual or new theoretical framework (Farooq, 2017; Bambale, 2014). Coincidentally, Kumar (2020) designed a framework as a journey on how a research process can be followed to achieve the required results, shown in Figure 4.2:
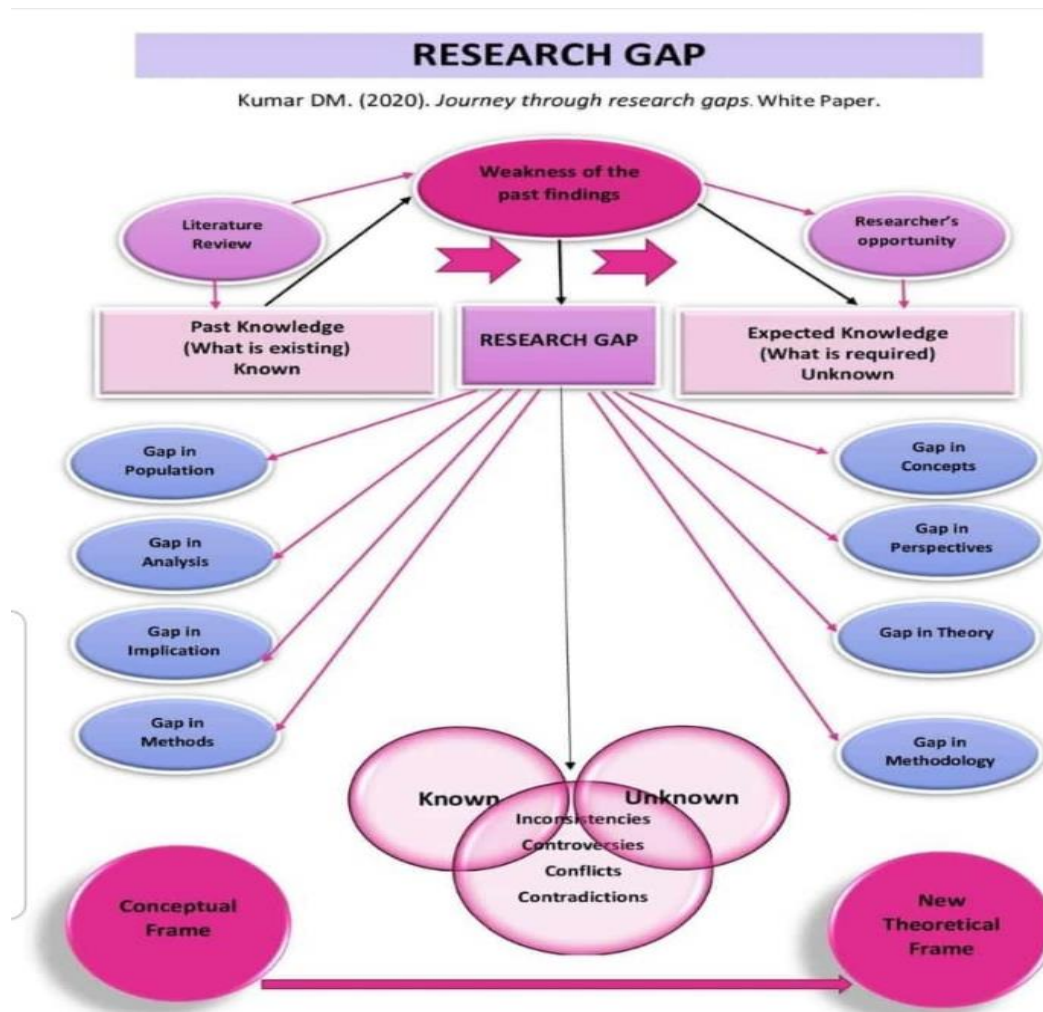
Figure 4.2: A journey through research gaps
(Kumar, 2020:1)

For a successful research study to take place there must be procedures that have to be followed to achieve the expected results. Such results should identify the research gaps that need to be filled in the process for the desired knowledge to be unveiled through a conceptual frame or new theoretical frame as indicated in Figure 4.2.

Anfara and Mertz (2015) believe that a theoretical framework is an empirical or quasi-empirical framework of social or psychological processes that could be applied at different levels of research (from the initial, middle and final stages) to understand the phenomenon. In this regard, it can be understood that the study conducted without a robust theoretical framework is similar to a building without a solid foundation (Sobeck & Agius, 2007). In comparing the role of a theoretical framework to that of a map or travel plan, Fulton and Krainovich-Miller (2010) mentioned that travelling to a particular location requires a map as a guide is similar to a theoretical framework used as a guide towards conducting research. This is done not to

deviate from the boundaries of the established theories and make a decision that is scholarly and academically accepted. Thus, Brondizio, Leemans and Solecki (2014) concur that a theoretical framework is a specific theory about aspects of human effort that can be useful for investigating events.

A theoretical framework is referred to by Grant and Osanloo (2014:12) as the "blueprint" or guide to research. Camp (2001:12) also described a theoretical framework "as a set of theoretical assumptions that explain the relationships among a set of phenomena". Thus, it is also referred to as a framework based on an existing theory in a field of inquiry that is related to and reflects the proposition of a study (Mensah, Agyemang, Acquah, Babah & Dontoh, 2020:56). Ideally, it is often regarded as a blueprint that is adapted by the researcher to build upon their research inquiry. Essentially, a theoretical framework often serves as the foundation upon which research is constructed towards developing a conceptual or a new theoretical framework for a study.

Further, a conceptual framework is a structure that a researcher believes can best explain the expected developments of a studied phenomenon (Camp, 2001:9). It is linked with the concepts used in promoting and systemising the knowledge advocated by a researcher and explaining how the research problem would be explored (Peshkin, 1993). A conceptual framework also presents an integrated way of identifying a study problem (Liehr & Smith, 1999).

Mensah et al. (2020:55) also describe a conceptual framework as "a tentative theory about phenomena being studied which informs the entirety of the study design". A framework represents a logical conceptualisation of the thoughts and operational elements of the entire research project (Imenda, 2014). Interestingly, a framework is arranged logically to give a structural display of how ideas relate to one another in a study (Grant & Osanloo, 2014). It also represents a diagrammatic presentation of how concepts relate to one another and the series of actions the researcher intends to take to finalise the study.

Generally, the effective use of HRIS in the health sector for the workforce has been in the spotlight for several years. It has not been able to yield conclusive results regarding identifying any form of benefit to the health sector (Were et al., 2019:3). Ideally, a theoretical framework refers to the skeletal explanation of previous studies used to develop a logical sequence of the study that would assist the researcher in addressing identified problems relating to the effective utilisation of HRIS in the health sector of SA.

This study adopted the innovation diffusion theory, knowledge-based theory, and TOE framework to develop a framework as described in the following:

4.8.1 Innovation diffusion theory

Innovation is referred to by Kassim, Ramayah and Kurnia (2012:606) as the innovative technological transformation, information and automation of organisations in a growing economy. Garcia and Calantone (2002:112) define innovation as "an iterative process initiated by the perception of a new market and new service opportunity for a technological-based invention which leads to the development, production and marketing [of] tasks striving for the commercial success of the invention". Rogers (2003:5) describes diffusion as "the process in which an innovation is communicated through certain channels over time among the members of a social system". Roger's definition shows that: i) innovation, ii) a communication channel, iii) time, and iv) a social system are the four critical components of the diffusion of innovations (Rogers, 2003; Ismail, 2006).

Fundamentally, accepting or not accepting innovative technology is a point made by Rogers (2003:177), who states that acceptance is a decision of "full use of an innovation as the best course of action available". At the same time, rejection is a decision "not to adopt an innovation". Subsequently, studies have shown that innovation diffusion has been tested in various sectors and has been recently introduced in the health sector, which requires further research on how innovation diffusion can support the health sector in general (Herrmann et al., 2018:1). Below are the explanations of innovation diffusion theory and the adopted theory for this study.

4.8.1.1 The innovation diffusion theory

In the face of innovation diffusion theory, IS such as HRIS is considered an IT system that results from technological innovations that should be applied within organisations (Kassim et al., 2012). However, Obeidat (2012:42) added that innovation diffusion theory could be used as an indicator of the attitude towards using a system, and organisations must be careful when implementing new innovative systems not to lose information. Subsequently, health needs to improve in terms of innovative ideas that would assist in moving the sector into the latest innovative technology and resource system. Therefore, this study adopted innovation diffusion theory (Kassim et al., 2012) on HRIS usage to conceptualise the theoretical framework. This is explained in detail below.

4.8.1.2 The adoption of innovation diffusion theory on HRIS

Teo, Lim and Fedric (2007:44) examined the relationship between technological innovation, organisational and environmental characteristics, as to the adoption of innovative HRIS, which shows that: i) relative advantage, ii) compatibility, iii) top management support, iv) organisational size, and v) HRIS expertise, are positively related to HRIS adoption in innovative technology. Furthermore, a study by Teo et al. (2007) examines the relationship between HRIS adoption related to the number of workstations and the application of innovation through organisational and environmental variables. They realised that organisational size and lack of top management support impact HRIS adoption concerning innovation.

A study conducted by Kassim et al. (2012) combined Roger's (2003) innovation diffusion theory with Remeyi et al. (1991) and Zuboff's (1988) IT framework to develop a theoretical framework for HRIS usage outcomes. Kassim et al. (2012:608) highlight that innovation diffusion theory which comprises (relative advantage, compatibility, complexity, visibility and trialability) influences HRIS usage in terms of information responsiveness, information autonomy, external professional link, transformational activities, and IS support activities.

Subsequently, HRIS appeared to serve as an empowering function for HR skills by providing a medium in which HR skills can improve the value of their work. Ideally, Kassim et al.'s framework emphasises the need for organisations to ensure a smoother HRIS usage plan by addressing the attributes of the innovation that would most likely concern its employees. However, in Obeidat's (2012:41) study on the relationship between innovation diffusion and HRIS, they emphasized that Innovation was treated as an independent variable and in contrast, HRIS was dealt with as a dependent variable. It was found that there is a positive relationship between innovation diffusion and HRIS. Thus, Obeidat's (2012) study found a relationship among, on one hand, relative advantage, compatibility, trialability and observability. On the other hand, HRIS functions. Ideally, the HRIS functions, according to Obiedat (2012), are strategic integration, HR analysis, forecasting and planning, personnel development, record and compliance, knowledge management, communication, and integration. Perhaps such a relationship could be justified in an organisation that would expect IS adoption to be successfully implemented.

The Internet and the automation of processes have encouraged openness, dependability, and precision of data, thus improving confidence, viability and initiative edge by applying innovation in different tasks (Anupa, 2021:22). However, HRIS is regarded as a transformed programming arrangement intended to assist organisations with robotising and dealings with their HR, finance, other departmental and work-related exercises through innovative

technology. Furthermore, Juma (2018:12) believes a positive relationship can be found among attributes like innovation and HRIS, relative advantage, compatibility, trialability, and observability. Consequently, the framework in Figure 4.3 below was adopted from Kassim et al. (2012). Their study focused on the relationship between innovation diffusion theory and HRIS usage.
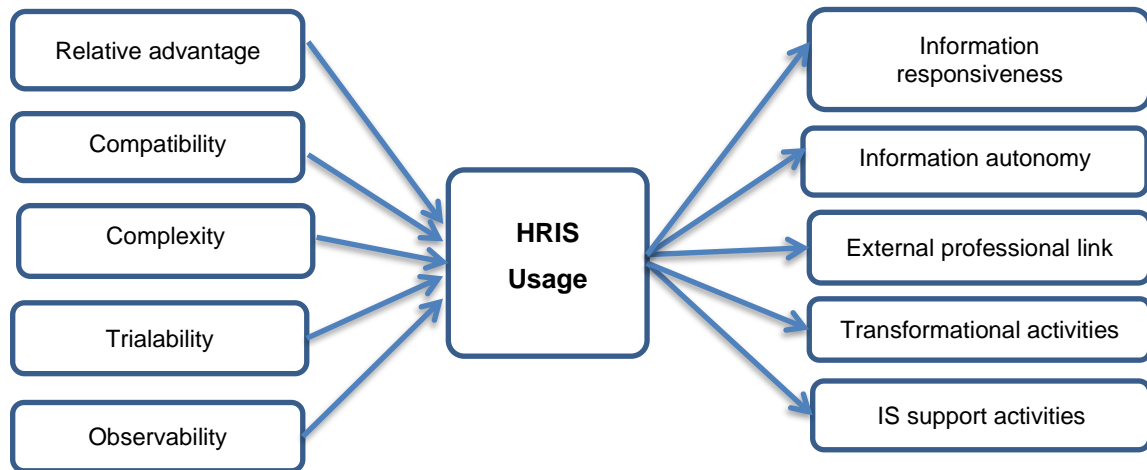
Figure 4.3: Innovation diffusion theory and HRIS usage
(Kassim et al., 2012:608)

4.8.1.2.1   *Relative advantage*

Rogers (2003:229) defined relative advantage as "the degree to which an innovation is perceived as better than the idea it supersedes". Ideally, comparative advantage refers to how innovation seems to be better acknowledged than the knowledge it replaces in an organisation (Rogers, 2003:15). However, a new innovative idea could create a better notion of HRIS usage as an added benefit which could also be measured as a relative advantage in terms of economic success, efficiency, and other IT-related benefits. Perhaps HRIS usage in an innovative environment would determine the contribution it could bring to the organisation in terms of benefits (Kassim et al., 2012). Coincidentally, the Technology Acceptance Model (TAM) framework by Davies (1989) indicates that an attributed benefit is perceived usefulness, which is generally the relative advantage of an innovation that seemed to be positively related to the level of IT usage. Thus, an effective HRIS could be categorised as a comparative advantage in a competitive environment.

4.8.1.2.2   Compatibility

Compatibility is "referred to as the degree to which an innovation is apparent and consistent with the existing values, past experiences and future potential users" (Rogers, 2003:15). However, the lack of compatibility of a system with discrete needs could negatively affect the individual's usage of the system. A newly proposed HRIS could be an ideal system that could be more compatible with the existing system, which might be uncertain to the potential users and hence fits closely to an innovation that can easily accept the potential users into their workstation. Surprisingly, Trimurni and Mansor (2020:266) emphasise that innovation can be compatible or incompatible. It depends on how it relates to the study in terms of the innovative ideas, and the usage of such IS in the health sector and other organisations.

4.8.1.2.3   Complexity

Complexity is the point at which an innovation seems relatively difficult to understand and use (Rogers, 2003:15). Ideally, any new or existing system could be classified in terms of either complexity or simplicity. Perhaps there is a notion that the excessive complexity of an innovation is an essential obstacle in the IS adoption process. However, technological innovation might confront some users with challenges of adapting and integrating with the new IS. The users might face different levels of complexity (Parisot, 1995; Ismail, 2006). Also, some innovative ideas could be unclear in terms of the usage potential, which could be categorised as a complex situation. Moreover, Kassim et al. (2012:617) mentioned that the characteristics of complexity are regarded as being easy to use and deal with the simplicity or difficulty in HRIS usage.

4.8.1.2.4   Trialability

Trialability is how innovation may have been subject to experimentation on a limited basis (Rogers, 2003:16). Trialability could be positively related to the adoption of IS, and the more trials are conducted, the faster the results are accomplished. However, decisions could be taken during the tests, whether positive or negative. It all depends on the users' wants and expectations in return from the trials of the system (Ismail, 2006:18). Perhaps new innovative ideas that could be tried on a segmented plan are usually accepted and utilised more hastily than the non-segmented ideas. However, Obeidat (2012:44) believes that some innovative ideas are more difficult to separate from others. The people who will be trying out the innovative ideas will be using that avenue to exercise the importance of innovation and indicate how it works to make people understand the system. This form of trial, which according to Kassim et al. (2012:607), might be uncertain with regard to HRIS because it

might require acquiring a new system or upgrading the existing system, and a decision on the trials might be complicated.

4.8.1.2.5   *Observability*

Observability or visibility is the point at which the results of an innovation are visible to others (Rogers, 2003:16). Essentially, the outcome of some innovative ideas is observed and discussed among the users. The more visible the innovative ideas, the greater the likelihood of acceptance simply because the benefits from the observation would be widely recognised (Mauro & Borges-Andrade, 2020:202).

Research on the adoption and utilisation of IS has been conducted and published over the years. However, the most prominent of them is a book on the diffusion of innovation written by Rogers (1983). Thus, the objective of Roger's research, according to Ahmer (2013:33), is to understand the impact of several characteristics of innovations and the outcome of IS acceptance and usage in organisations. Subsequently, Kassim et al.'s (2012:606) adapted framework is based on the combination of: i) theory of adoption and ii) theory of IS acceptance and usage. Haines and Petit (1997) and Nzilani (2021) are of the notion that training, support, documentation, and software development are part of the major factors that contribute to IS user satisfaction and system usage. Al-Razgan et al. (2021:5) believe that extensive IS usage does impacts HRD functions which is high in demand for IS support.

Essentially, formalising an effective and sustainable health workforce is presently limited due to the lack of customised IS for measuring their performance. However, Bayraktaroglu et al. (2019:55) believe that there is a strong connection between acceptance of technology, use of technology and user satisfaction. Perhaps effective HRIS is also helpful in the health sector for technical support, online support, and other services as there is a need to develop strategies for system user satisfaction.

Agarwal et al. (2019:1) identified some strategies that could motivate innovations for user satisfaction as: i) incentives, ii) supervision, iii) performance appraisals, iv) data usage and reporting, v) service quality and delivery, vi) absenteeism, vii) community usage and experience of services, viii) credibility, and ix) trust. This study was geared towards developing a framework for practical HRIS usage in the health sector that may assist in achieving the strategies identified above.

4.8.2 Knowledge-based theory

According to Grant (1996:109), "Knowledge is viewed as residing within individuals and the major role that organisations expect to achieve is knowledge application rather than knowledge creation". Additionally, Rajneesh and Kaur (2014:198) describe knowledge as the "process of translating information (such as data) and experience into a meaningful set of relationships which are understood and applied by an individual". Also, Davenport and Prusak (1998:5) define knowledge as "a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. Practically, knowledge is applied in the minds of the knower". In other words, knowledge usually resides and is embedded in various types of documentation and activity, including records, documents, procedures, processes, databases, routines and practices (Davenport, De Long & Boers, 1998).

In certain situations, knowledge achievement is determined by the success of an organisation's performance (Zvobgo, Chivivi & Marufu, 2015; Ankrah & Sokro, 2016). Ideally, Liangtie and Qiongyu (2014:171) believe that a knowledge-based system adopts a distributed resource and task allocation strategy. However, knowledge transfer might not be an efficient approach to integrating knowledge. The key to efficiency is achieving effective integration by maximising knowledge transfer through IS enhancement and learning processes (Grant, 1996:114). Perhaps there is a need to transform personal to organisational knowledge for better organisational capabilities (Grant & Baden-Fuller, 1995:17).

Dosi (1995) highlights the contribution of knowledge-based theory to economic development and identifies three significant areas of focus: i) learning processes and organisational competence, ii) technological and organisational dynamics and iii) innovation, competition and macro dynamics. However, these three areas of focus need to be articulated through an effective IS for knowledge enhancement and efficiency. Interestingly, Kavanagh and Thite (2020:413) identified an IS known as Software as a Service (SaaS) model for knowledge-based sustenance, which can be installed in organisations' servers for employees to have access to scale up their knowledge and skills. Unfortunately, there is still the need for proper upskilling of workers' knowledge through an effective system.

Perhaps there is a need to understand the importance of knowledge retention and transfer through an HRIS irrespective of the costs of competitive advantage. According to Zaman et al. (2021:119), costs and application of knowledge-based processes in government institutions through IS models could be appropriate irrespective of technical infrastructure costs. However, Beulen (2009:270) believes that HRIS could contribute to staff retention through global IT provision irrespective of its costs.

Effective knowledge management (KM) in the health sector would require IS service as mentioned by Beulen (2009) for effective Knowledge retention in the public sector. KM is recognised to enhance organisational efficiency and performance (Mullei & Misuko, 2019:114). Essentially, KM is a new method for thinking about sharing creative and intellectual resources in organisations and, in other words, it consists of all the ways by which it manages its knowledge-based assets, including: i) knowledge collection, ii) storage, iii) transmission, iv) usage, v) updating, and vi) creation (Rajneesh & Kaur, 2014:198). Further, organisations use KM as a significant component to improve their performance.

Scupola and Pollich (2019:6) recommend that public sectors improve their internal practices to be in line with the staff's strengths. They also suggest that organisations conduct internal tests to enhance service delivery to clients/patients, collect clients/patients' feedback and use it to improve practices and effective decision-making processes. Thus, Karamat, Shurong, Ahmad, Waheed and Khan (2018:1) remarked that KM and IS must be enhanced to maximise the health system for effective HRIS. Furthermore, Amer and Kunos (2019:12) show that a relationship between IS and KM boils down to an improvement in organisational objectives.

4.8.2.1 *Importance of knowledge-based theory*

The knowledge-based theory assists organisations in choosing the right skilled workforce for a particular job. Grant (1996:115) made it known that the importance of knowledge is that it allows individuals to share aspects of unique skills among them. However, the extent of a successful knowledge transfer among workers depends on the characteristics of the transferred knowledge (Valtakoski, 2017:145). Amer and Kunos (2019:14) identified the importance of knowledge-based theory as: i) the methods needed to search and serve clients to achieve their needs through the use of IS, ii) identifying the way organisations booked their space in the competitive global market, iii) achieving clients' satisfaction and allegiance, iv) attainment of development and innovative modern IS tools that do facilitate investment responsibilities, v) reduction in the time expected by workers to acquire new knowledge, and vi) provision of a comprehensive and transparent IS.

Magd (2015:1) mentions the considerable importance of knowledge management because little knowledge is documented and often disappears when staff resign. KM is an essential tool for organisational excellence, performance, and competitive advantage through effective HRIS in place. Rajneesh and Kaur (2014:202) also emphasise that organisations nowadays have realised that to succeed, they must view knowledge as an asset and manage it effectively

because knowledge management facilitates companies being faster, more efficient, and more innovative.

4.8.2.2 Steps to follow in developing knowledge-based theory

Different researchers have identified additional steps to follow in developing a knowledge-based theory. For example, Amer and Kunos (2019:15) identified six steps that can be followed to develop a knowledge-based theory. These steps are to: i) ascertain the global objective and goals of knowledge usage, ii) select tools and strategies of knowledge recruitment, iii) allocate tasks to those in the authority to assist with managing and hiring, iv) identify the possible spread of knowledge and its recipients, v) inspect the knowledge used in the proceeding to employment, and vi) evaluate knowledge after recruitment. These steps are necessary to develop a theory for an effective knowledge-based process in an innovative organisation (Gardeazabal et al., 2021:7).

4.8.2.3 Forms of knowledge-based theory

Various researchers have classified knowledge-based theory into different forms (Nickerson & Zenger, 2004). However, the seminal work of Buckland (1991) identified knowledge as being represented in data, facts and other forms of information storage and the information processed in a meaningful pattern. Amer and Kunos (2019:15) illustrated the forms of knowledge-based theory as follows: i) shared knowledge is the transfer between people and invested organisations, ii) synthetic knowledge is categorised by clarity, iii) internal knowledge is the transfer of information from clear to implicit knowledge, and iv) external knowledge is the transfer of knowledge from a human to written form. These forms of knowledge could be initiated in HRIS to create a platform where people can share their knowledge. When they leave the organisation, their knowledge and experience will remain in the organisation for continuity, retention and sustainability purposes (Fernando & Gamage, 2021:87).

4.8.2.4 Competency and knowledge-based theory

There are differences between competency and knowledge, but they create a huge positive difference in an organisation when combined. Several studies on the effect of competencies in an organisation show that in a knowledge-based organisation, success depends mainly on the quality of the HR and its reliance on competent employees as their primary resource (Soderquist, Papalexandris, Ioannou & Prastacos., 2010; Fernando & Gamage, 2021). For competency and knowledge-based theory to come into place, organisations' strategies must

be considered to identify, nourish and utilise a competent workforce (Chouhan & Srivastava, 2014; Huang et al., 2016). Also, for competency in the health workforce to be effective requires a programme, design and teaching methods focusing on learning to maximise performance and improve working capabilities to meet the organisational objectives (Huang et al., 2016; Sandjong, 2021).

Further, a study on the use of a competency HRM approach to design the HRIS digital dashboard model shows that competency is the keyword in measuring organisational success. Perhaps every worker has to be evaluated based on their knowledge and competency to weigh the efficiency of their outcomes (Ben Moussa & El Arbi, 2020:22). Essentially, Munthe, Baswardono, and Satria (2019:1) emphasise that an effective HRIS digital dashboard consists of interoperable ISs such as: i) talent dashboards, ii) competency gap dashboards, and iii) comparison dashboards, which are used to identify, plan, design and evaluate the worker's degree of competency in their workplace. These HRIS dashboards are needed to measure workers' competency in the health sector because, with such systems, organisations can easily identify workers who are more competent than others.

Ghanbari et al. (2020:508) conducted a study on a global health programme in SA to facilitate the exchange of competency, information and experience among healthcare students and found that the invasion of a worldwide pandemic such as COVID-19 created fear among the healthcare students. This warranted physical distancing between them, which affected the achievement of knowledge transfer in the sector. Perhaps knowledge transfer needs to be focused on using IS such as HRIS technologies to avoid close physical communication among workers. Withers, Lin, Schmidt, Trinos and Kumar (2019:1) commented on implementing a competent global health structure that will be inculcated into HRIS for health sector development. This study adopted Beulen's (2009) knowledge-based theory on HRIS to staff retention as part of the conceptualised framework.

4.8.2.5 Adopted knowledge-based theory for HRIS

There are several studies of knowledge-based theory introduced by researchers, but this study will be adopting Beulen knowledge-based theory as part of the framework. These Beulen (2009) knowledge-based theory concepts are explained as shown in Figure 4.4 below. Beulen's (2009:270) knowledge-based theory identifies six main activities that relate to HR functionalities and knowledge-based systems in HRM, to weigh the contribution to retention management in organisations: i) HR planning, ii) performance evaluation, iii) recruitment and selection, iv) staff development, v) regulatory compliance and vi) benefits administration. Nath and Satardekar (2015:4) added that the activities mentioned above by Beulen are regarded as

strategic proportions for organisational continuity, which relies on human capital's value and importance and also identifies knowledge as a significant part of human capital.
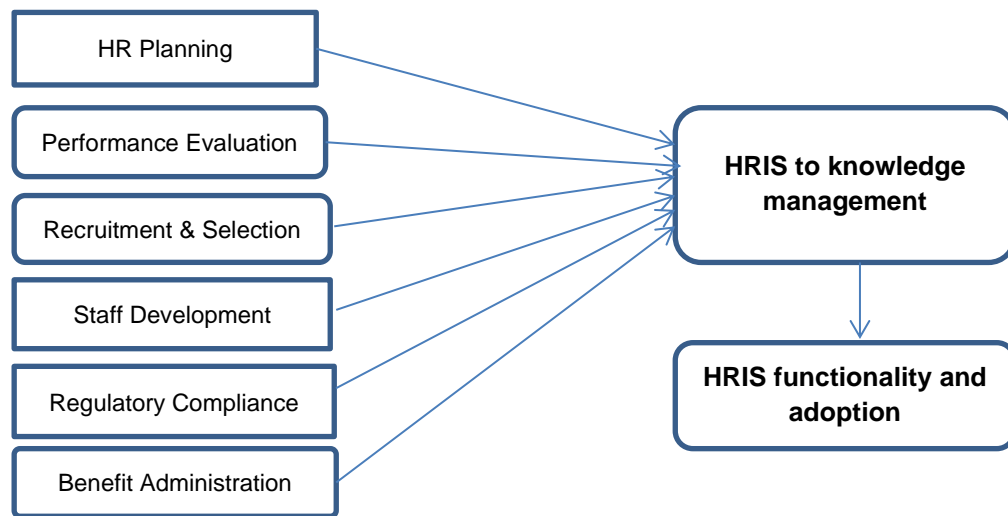
Figure 4.4: Knowledge-based theory for HRIS
(Beulen, 2009:274)

4.8.2.5.1   Human resources planning (HRP)

HR Planning (HRP) is allocating the precise number of qualified workers to the right task and at the right time (Pasha & Priyanka, 2021). However, the primary reason for the enhanced use of the internet to support HRP is that the internet is crucial in managing and striving to achieve strategic business goals. These technological advances are thought to increase the ability of HR workers to monitor the workforce, quickly produce reports, effectively utilise employee skills and reduce labour costs (Al-Dmour, Obeidat, Masa'deh & Almajali, 2015:39).

Essentially, HRP comprises strategies such as employee flexibility, absence management, retention, recruitment, talent management and selections (Macharia, 2016:10). However, HRP further deals with: i) effective management, ii) effective strategic management, iii) effective business management and most importantly, iv) effective people management (Yadav & Dabhade, 2014:44). Fundamentally, concise thought and careful planning are needed for proper HRP. Also, an appropriate HR audit through HRIS is required to assist HR in ascertaining areas of weakness and improving where there is a need.

Mohammed (2021:95) also states that an effective HRP would require an HR practice that aligns with the business plans and ongoing process where an organisation needs to monitor and forecast the personnel needs and concerns of the workforce. In a knowledge-based environment in the health sector, the focus should be on the management mix to realise the

effectiveness of HRP (Sirili et al., 2020:151). Ideally, the management mix is of different knowledge levels. The main objective is to gain a thorough knowledge of HRIS and its usefulness for HR functions in the health sector. Therefore, there is a need to have a quality HRP as part of knowledge-based management that will be added to the developed framework of HRIS as a technology utilisation model for the health sector.

Interestingly, Preko et al. (2019:3) emphasise that technology improvement could introduce a new feature of healthcare delivery, increasing the demand for skills required to take up the IT roles in healthcare. However, the IT roles that could emerge from the mix of e-health workers employed in the sector still do not assist in measuring the competency capabilities in the industry (Preko et al., 2019).

4.8.2.5.2   *Performance Evaluation (PE)*

Performance evaluation (PE) is described as "the process of identifying, observing, measuring, and developing employee performance in an organisation" (Schraeder, Becton & Portis, 2007; Mulievi & Wanyama, 2019). In other words, PE is referred to as a management tool that is used to raise the performance levels of the workforce and a systematic valuation process between the workforce and management to achieve expected goals. According to Ahmed (2016:2), PE does provide the critical foundation of management decisions such as: i) allocation of duties and responsibilities, ii) provision of feedback to workers about their performance, iii) need for training and development, iv) promotion and demotion, v) transfers, vi) salary payments, vii) increase in motivation and productivity, viii) decision-making, and ix) increase in commitment among the employees.

Interestingly, PE is a system that analyses workers' performance on the job (Gupta, 2013:44). In some organisations, workers have their performance reviewed intermittently through appropriate IS such as HRIS, with the performance reviews available immediately to people involved in the process. However, little research has been done on online performance evaluation applications (Al-Dmour et al., 2015; Ahmed, 201; Njeje, 2018). However, the internet could play an important role in reducing the struggle of managing PE through digital transformation and consistency (Al-Dmour et al., 2015:36).

PE practice provides a mechanism to manage workers in the health sector. Perhaps some organisations conduct PE through a digital system. However, there is a need to streamline the retention of employees by providing strategies for workforce retention through PE.

HRIS offers the potential to assist in employee retention (Mulievi & Wanyama, 2019:970). Ideally, when workers are managed with easy access to PE, they could become more committed to the sector, leading them to reveal a proper role in their behaviour, commitment, and better service delivery. Ahmed (2016:1) also commented on the issue of PE, that the significance of using HRIS in appraising employees' performance is that the system did not address the vital purpose of its usefulness. Instead, it was primarily used for promotion, feedback, and salary purposes, which was unreasonable and limited the effective use of HRIS. Therefore, there is a need to propose a further investigation into the use of PE for knowledge-based capacity and identify areas of improvement for knowledge and competent retention in the health sector.

Nurses are regarded as the most critical part of the workforce in the health sector and are presumed to make up the largest workforce (Williams & Ferguson, 2021:36). Ideally, the success of the health sector depends significantly on the nurses' ability and willingness to provide quality and efficient healthcare services (Moshidi, Malema, Muthelo & Mothiba, 2021:1). However, a sound and effective PE system can be valuable to ensure that nurses are appropriately motivated, trained, promoted, and rewarded (Madlabana, Mashamba-thompson & Petersen, 2020:1).

Nthiga and Nyang'au (2021:96) believe that despite the significant benefits of an effective PE, such as motivation, job satisfaction, and morale, the system is still highly contested. Also, it makes the process difficult to examine the importance of PE methods and practices and understand its consequences and lack of PE usage through an IS. With the growing rate of healthcare challenges that have put pressure on healthcare management, monitoring and evaluating HRH to strengthen the knowledge base in the health systems is still a problem (Zhai & Qi, 2014). Thus, there is a need to identify the impact of effective PE as part of the knowledge-based theory for effective HRIS utilisation for healthcare benefits.

4.8.2.5.3 *Recruitment and selection*

Recruitment and selection have become challenging and complex tasks for HRM functions in an organisation. The process offers knowledge-intensive services dependent on HR, representing a cornerstone for value creation (Al-kassem, 2017:40). According to Naim and Lenka (2017:10), numerous studies have shown that organisations are increasingly distressed with issues around the scarcity of knowledge. Some organisations may have an HRD that is not technologically advanced enough to handle difficulties such as low levels of retention and excessive workforce turnover rate as their prime responsibilities (Dlamini, Zogli, & Muzanenhamo, 2021:17). Perhaps this could have a significant impact on the strength and

weaknesses of organisations in managing their workforce recruitment and selection process in a competitive environment.

Effective recruitment and selection are an integral part of a knowledge-based system that makes it possible to acquire the proper knowledge and ensure an organisation's continued operation. This process is not a single or abridged function but a cluster of plans, systems, tools, techniques, and services required for an effective knowledge-based system (Al-kassem, 2017:42). Interestingly, Wesolowski (2016:8) commented on the use of IS for recruitment as an avenue to attract the proper knowledge. Web-based HRIS technology on recruitment has gathered huge support academically as the appropriate way to attract expertise and also distribute recruitment procedures to the public sector in a developed economy (Wahid & Kurnianda, 2021:4). Using HRIS technology is suitable due to its levels of interaction with web-based recruitment tools.

Essentially, Khadija and Omar (2019:123) believe that the advancement of technology in recruitment and selection has assisted job seekers with more options when choosing a career path and also assists in streamlining the hiring processes in the health sector. Thus, El Ouirdi, El Ouirdi, Segers and Pais (2016:240) suggest that technology to conduct recruitment is usually called "knowledge-based recruiting" which includes different practices and offers several advantages in this process. However, studies show that some organisations use LinkedIn, Facebook, Twitter, Researchgate, and other IS sources for recruitment and selection (Owusus-Ansah & Nyarko, 2014; Wardlaw, 2019; Lumi, 2020; Esangbedo, Bai, Mirjalili & Wang, 2021). Therefore, using technology-based platforms to conduct recruitment and selection could be an advantage for those organisations making use of them, but would be more appropriate when linked to HRIS.

Additionally, Shaikh, Asim and Manzoo (2021:1) believe that contemporary and successful organisations are relentless in effectively conducting their workforce activities, recruiting highly qualified and knowledgeable employees for their competitive advantage. Also, Jalloh, Habib and Turay (2015:121) remarked that inspiring these eligible employees to be interested in working in their organisations is a critical knowledge retention strategy to be expanded in the health sector. Thus, the government has an essential role in setting up standards that help guarantee the effectiveness of recruitment records through an HRIS for knowledge retention and succession planning strategy (Beulen, 2009; Wardlaw, 2019). Therefore, there is a need to inculcate the recruitment and selection process as part of the knowledge-based theory, which will be used to conceptualise HRIS as a technology utilisation model for retention and benefits purposes.

4.8.2.5.4 *Staff development*

Staff development is not a choice but a necessity if organisations want to achieve their goals and objectives. According to Naris (2009:5), staff development is described as "all activities, actions, processes, policies, programmes and procedures employed to facilitate, support and enable the workers to improve their performance that would result in the achievement of organisational objectives [and] goals". Kovane (2015:19) emphasises that low self-esteem and dissatisfaction among health workers are primary reasons for the lack of staff development. Most of today's organisations are paying more attention to seeing how their HR functions and strategies could be organised to achieve staff development strategy (Beulen, 2009:285). However, HR is put under pressure to have the required knowledge-based theory to be effectively used to perform their duties diligently, especially regarding dealing with the issue of low self-esteem and displeasure in the working environment.

Tulu, Demie and Teshome (2021:2) established a relationship between HRIS and staff development. They claim that for an organisation to augment staff development there must be a fundamental IS to support any application that they would want to invest in, which includes a knowledge management system in HRIS. Furthermore, staff development is referred to as the process whereby the workforce of an organisation enhances their knowledge and skills with guidelines that can be attributed to their position in an organisation (Michelo et al., 2017:11). Kumar et al. (2021:12) also argue that healthcare employees regard staff training and development as the forefront of organisational and employee success. Management should appropriately recognise the efforts and results of knowledgeable employees through various reward practices, which is paramount to using HRIS for staff development in the health sector.

Most organisations emphasize staff training and development to improve employee knowledge, skills, and ability, which would eventually enhance work performance and achievement of service delivery (Egieyeh, van Huyssteen, Coetzee & Bheekie, 2021:2). However, some healthcare organisations have begun to introduce staff development policies, procedures and practices to ensure that workers are equipped with the necessary skills to improve their work performance (Papac, Pejanović-Škobić & Bošnjak, 2020:166). Thus, there is a need to evaluate staff training, development and motivational policies and practices to determine their effectiveness. Interestingly, effective staff development would require less supervision and tend to have higher morale and lower levels of attrition.

Omambia (2021:2) states that there is a need to nullify the influence of factors that cause displeasure among the health workforce, which impact their education, training, learning and support services and a concern that deprives the worker's growth within the sector. There is a

need to view staff development as part of the knowledge-based theory that is added towards conceptualising the HRIS technology utilisation model for health workforce sustainability.

4.8.2.5.5 Regulatory compliance

Regulatory compliance is regarded as an environmental factor of a knowledge-based process that can profoundly impact the effectiveness of HRIS adoption, and utilisation and also determine its beneficial intentions (Warui, 2016:37). For the health sector to adopt a system that can assist in fulfilling regulatory compliance, they need to access the regulatory requirements concerning the legislature that can drive the HRIS adoption and utilisation process (Troshani et al., 2011:479); and also, by rejecting the non-compliant system and then accepts the compliant system that identifies the skilled workers (Tesha, 2020:7).

According to Beulen (2009:283), the most critical aspect for staff development and regulatory compliance is a standard HRIS across the healthcare centres, requiring the establishment of global HRIS functions with well-defined organisational roles. Ideally, an updated HRIS would be needed in the medical sector to effect knowledge improvement through technology.

HRIS is further referred to as a software system that attends to HR activities relating to workforce information access and organisations' regulatory compliance (Phahlane, 2017:9). This IS software is required to assist in storing, manipulating, analysing, retrieving, and dispersing HR information (Oyaro, 2018:3). Furthermore, Kiros (2018) and Sankar, Yoganandham, Kalaichelvi, John and Kumar (2021) mentions that HRIS assists in recording personal workforce details and job-related information and ease planning by matching workers with the job they are qualified for, with security features and data tracking devices for regulatory compliance. Regulatory compliance is used to implement laws that protect the personal details of individuals and produce reports for government decisions relating to regulations (El & Tarabah, 2020:46).

Fundamentally, regulatory compliance and successful adoption of systems are both found to be positively affected by management commitment to supporting the strategy of retaining skilled knowledge due to the complexity of HRIS utilisation (Hanif et al., 2014:162). According to Nath and Satardekar (2015:4), the strategic dimension of organisational stability and success relies on the value and importance of human capital. Knowledge is identified as a significant part of that capital and achieving such success would require implementing regulatory compliance for effective success-based theory implementation. Beleke (2013:37) reports that the cost of regulatory compliance is a challenge for knowledge sustainability when

a country such as SA does not have uniform requirements on health safety and restrictions on health services, which might lead to poor service complications.

Scupola and Pullich (2020:8) indicated that globalisation signifies that mobility outweighs potential talent and intensified competition. The health sector could employ workers from overseas if compliance permits. However, under competitive advantage, this desire of hiring from overseas might impact the HR services and costs of regulatory compliance sustainability. Perhaps Mohan and Gomathis's (2014:24) study indicates that some organisations go for HR outsourcing to reduce cost and regulatory compliance (transferring legal risks to outsourcing) to avoid being penalised for non-compliance internally. Such practice causes organisations not to retain their skilled knowledge workforce, which is a significant problem.

Regulatory compliance is also considered by the HR department of the public sector as one of the required knowledge management functionalities in HRIS for support strategies to be achieved (Maruru, 2014:18). Furthermore, regulatory compliance is connected to government regulations and cannot be avoided, making it very relevant to the government. According to Yadav and Dabhade (2014:45), HRD is often overlooked for audit purposes to assess the effectiveness and legal, and regulatory compliance. Matsiko's (2019:26) study supports Maruru (2014) in maintaining that currently, countries such as SA lack the sustainability of regulatory compliance framework for ICT and government workforce strategies. However, numerous studies indicate that HRIS in the current scenario of ICT has become a non-regulatory phenomenon, which could result in a defective implementation of technology that could lead to confusion between the health department and the healthcare facilities for compliance purposes (Valcik et al., 2021:23).

The use of Text Information Extraction Systems (TIES) for regulatory compliance: the recruitment of a reasonable proportion of the health workforce remains a significant impediment to successful health sector sustainability. However, Jacobson et al. (2015:5194) introduced the TIES as a research network for members and staff to access their data. Thus, the IS incorporates multiple securities and privacy codes combined with legal agreements, network policies and procedures that would enable regulatory compliance. When an organisation uses HR outsourcing to reduce costs, TIES will not be effective in such a situation (Jacobson et al., 2015:5194). This indicates that regulatory compliance is critical for the progress and continuity of organisations. HRIS in health will require such compliance as part of the knowledge-based theory to support the IS effectiveness in the health sector.

4.8.2.5.6   *Benefits management*

Benefits management is a function that is recognised as part of the knowledge-based theory (Beulen, 2009). Benefits management is the control of the overall staff benefit policies in an organisation and can be efficiently performed with the involvement of an IS such as HRIS. According to Kumkar and Rajhans (2015:1955), HRIS can provide a system where organisations administer and track workers' participation in programmes relating to their benefits such as insurance, compensation, profit sharing, retirement and pension. According to Al-Dmour et al. (2015:39), such a process can be linked to a system where it is used to track benefit entitlement with dates, initiate reports to remind HR and workers of what their benefits are, and make sure that remittance/deductions are made in the payroll system accordingly. Benefits management can also assist in managing workers' fringe benefits (Gupta, 2013:44). However, Martinsons (1994), as well as Gautam (2017), made it known that benefits management IS was the next after payroll to be introduced in the early 1960s to manage workers' benefits and entitlements electronically. This could be recognised as part of the knowledge-based systems.

HRIS is regarded as a knowledge-based system made in different forms with different capabilities that companies have to choose according to their abilities and what they intend to achieve (Kazmi & Naaranoja, 2014; Okwang, 2020). This rests on their aim of choosing the right skills and retaining the proper knowledge in the organisation. Based on previous studies, a much better HRIS in the health sector would provide an overall IS which would include benefits management that has enrolment, status changes and personal information of the health workforce if effectively utilised (Waters et al., 2017; Orakzai et al., 2017; Simms, 2020; Wahid & Kurnianda, 2021). Furthermore, benefits management is part of the knowledge-based system used to monitor the benefits accrued to workers. There is a need to include such a system in the proposed framework of HRIS usage in the healthcare setting for retention, sustainability, and workforce benefits.

4.8.3   Technology—Organisation—Environment Framework

The Technology—Organisation—Environment (TOE) framework was developed by Tornatzky, Fleischer and Chakrabarti (1990), which proposed accommodating organisational components and other IS functions that influence the adoption and utilisation of technology for effective decisions and competitive advantage. Practically, Tornatzky et al. (1990) developed the TOE framework for organisational adoption based on the Contingency Theory of Organisations. According to Arpaci et al. (2012:38), the TOE framework proposes that an effective organisation must have a structure consistent with its environmental needs for sustainability purposes.

Alam et al. (2016) explain that the TOE framework designed by Tornatzky et al. (1990) is based on three contexts: i) technological, ii) organisational, and iii) environmental. However, these contexts could assist in exploring the influence of practical adoption of IS for effective TOE. Also, Masum, Abid, Arafat and Beh (2020:702) mention that the TOE framework is one of the most widely used frameworks to examine the adoption of factors that contribute to IT innovations in organisations. However, some studies on IT adoption found that the appropriateness of applying the TOE framework is still yet to be accomplished (Valcik et al., 2021:6).

Various factors affect IT investment in the health sector. Additionally, Alam et al.'s (2016:7) study on examining IT adoption in hospitals reveals that in the alignment of human capacities, organisational factors and technological strength are strategic to IT adoption. However, these factors are common problems in developing countries, especially in the development of technology innovation (Defitri, Bahari, Handra & Febrianto, 2020:40).

4.8.3.1 Adopted Technology—Organisation—Environment Framework for HRIS

The TOE framework is the foundation for understanding the legitimate requirements and issues of responsibility and ethics in organisations that work with the adoption and acceptance of new technology (Scupola & Pullich, 2020:7). However, HRIS technology that the TOE can inform could impact the values and leadership philosophies in the health sector (Alam et al., 2016).

In a study conducted by Defitri et al. (2020:40) on the TOE framework: i) the ICT Infrastructure represents the technology context variable, ii) the HR competency represents an organisational variable, and iii) the external pressure represents the environmental context variable. It was noted that there is a relationship between ICT infrastructure and HR competency, which impacts the external pressure of IS adoption. Arefin and Hosain (2019:39) also mention that the lack of adequate ICT infrastructure and e-government system makes it unfeasible to adopt the TOE framework.

The availability of HRIS and running a system could trigger success. A TOE framework cannot be efficient without the availability of HRIS technology, resources and trained personnel to operate the system (Alam et al., 2016). Further, the focus of new technology adoption will require adequate personnel and training programmes for the benefit of HRIS. The TOE framework adopted for this study (Alam et al., 2016:8), is shown in Figure 4.5:
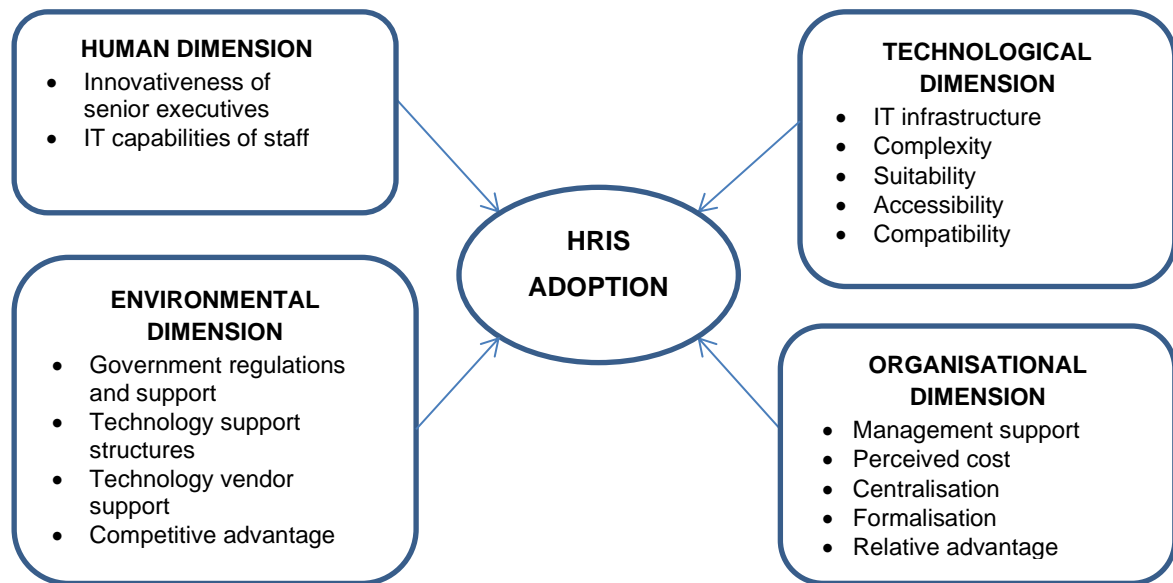
Figure 4.5: Technology, Organisation and Environment framework for HRIS

(Alam et al., 2016:8)

4.8.3.1.1 Organisational dimensions

The organisational dimension includes the structures and assets of an organisation. This also covers the size, management support, employees support, familiarisation, centralisation, security, the scope of the business, and its relative advantage (Alam et al., 2016). There are ways in which organisational dimensions could influence the adoption of an IS, such as HRIS. However, previous studies have identified the adoption of HRIS using the TOE framework in the context of the health sector, which identifies organisational dimensions as one of the most important factors to be considered when adopting an IS such as HRIS (Hameed, Counsell & Swift, 2012:365).

Ideally, several that have combined organisational factors and HRIS adoption into one dimension, particularly in the health sector, intend to understand the influence of organisational factors on adopting the TOE framework concerning HRIS (Polivka & Dvorakova, 2021:8). Essentially, organisational dimensions, can also be attributed to elements such as: i) change management, ii) proper accountability, iii) financial support, iv) top management support, v) training, and vi) social influence (Alam et al., 2016). These elements are critical to the effectiveness of organisational responsibility in conceptualising HRIS usage within the organisation (Hawash, Mokhtar, Yusof & Mukred, 2020).

4.8.3.1.2   Technological dimensions

The technological dimension (a set of interrelated components or factors) containing the attributes related to technology) refers to the factors linked with technical characteristics that influence users' behaviour (Hawash et al., 2020). However, technology is a significant aspect of records management. It also includes technological factors involved in IS adoption, such as HRIS, notably in the health sector. Interestingly, technology also encompasses the actual compatibility of the existing system in terms of linking it with a new system through software, hardware or networks, and how they are successfully adapted to achieve best practices (Puspitarini et al., 2018:27).

Thus, technological contexts can positively or negatively influence the management of information for sustainability, depending on how they are used. Also, there is a need to identify the importance of technology to continuity through adopting the TOE framework (Alam et al., 2016:8). Alam et al. (2016:8) emphasise that the technological dimension provides best-practice guidelines that help organisations to manage systems such as HRIS through factors such as: i) availability of technology, ii) IT sophistication, iii) IT suitability, iv) IT accessibility, and v) IT compatibility. Arefin and Hosain (2019:39) are also of the opinion that in a TOE framework: i) IT infrastructure, ii) top management support, iii) IT capabilities, iv) perceived costs, and v) competitive pressure are the main critical factors that affect the decision to adopt HRIS. These factors could influence changes in adopting the TOE framework for effective systems in place. If effectively adopted in the TOE framework, an HRIS is more likely to be adopted as required technical support for workforce management in the health sector.

4.8.3.1.3   Environmental dimensions

The environmental dimension is also vital for organisations to liaise and manage their environment effectively because it could impact workforce performance. Alam et al. (2016:8) identified some of the environmental factors that influence the adoption of HRIS as: i) government regulations, ii) technology support structures, iii) environmental structures, iv) infrastructures, iv) industrial characteristics, and v) competitive advantage. Perhaps these factors could create a positive relationship between HRIS and TOE expectations in a reliable working environment.

Fundamentally, the efficiency of communication with the surrounding environment of an organisation could determine either its success or failure of achievement. However, several environmental restrictions hinder organisations from adopting a proper IS (Hawash et al., 2020). Perhaps the present situation of the environmental context of an organisation could influence the effective adoption of the TOE framework, which could positively impact the

competitive environment of the organisation (Bryan & Zuva, 2021). Moreover, the potential competitive environment could contribute to the sector accepting new systems such as HRIS speedily to provide better services and gain a strategic advantage if adopted effectively.

According to Kiros (2018:21), the variance in the relationship between HRIS and TOE could be affected by various environmental factors such as competitive advantage, including policies and regulations, which would explain why environmental dimensions were ranked the least influential of all the sizes. There is a need for organisations to create a policy for workflow processes and a proper records-management system with an integrated TOE framework to assist in the communication and connection of healthcare policies through the reliance on the existing environment and IS.

Furthermore, the TOE framework can enable the analysis of the effect of organisational components for decisions relating to health workforce sustainability and retention using HRIS. According to Gray and Vawda (2017), three factors represent both the constraints and opportunities for innovative technology to assist in making decisions to have HRIS that will support the health sector to achieve competitive advantage. The TOE was part of the chosen frameworks appropriate for this study used to develop a framework that better explains the HRIS usage in the health sector to achieve a sustainable workforce environment.

4.9   PROPOSED FRAMEWORK

The proposed framework was adapted from: i) innovation diffusion theory which deals with the new innovative ideas for improving technology (Rogers, 2003), ii) knowledge-based theory that deals with improving the knowledge and expertise of workers (Grant, 1996), and iii) TOE framework which talks about the accommodation of organisational and environmental components that influences the adoption of technology for competitive advantage (Tornatzky et al., 1990).

Ideally, the framework comprising three independent variables known as: i) managerial, ii) technological, and iii) external and a dependent variable (HRIS to workforce management and sustainability) was developed by the researcher. The dependent variable (HRIS to workforce management and sustainability) relies on the flexibility and relationship among the independent variables (managerial, technological and external factors) on the use of HRIS to assist in the management and sustenance of the health sector workers (Fashoto, Ajiboye, Owolabi, Metfula & Fashoto, 2018; Waterfield, Shah, Kimsey, Mase & Yin, 2021).

The proposed framework of this study is shown in Figure 4.6:
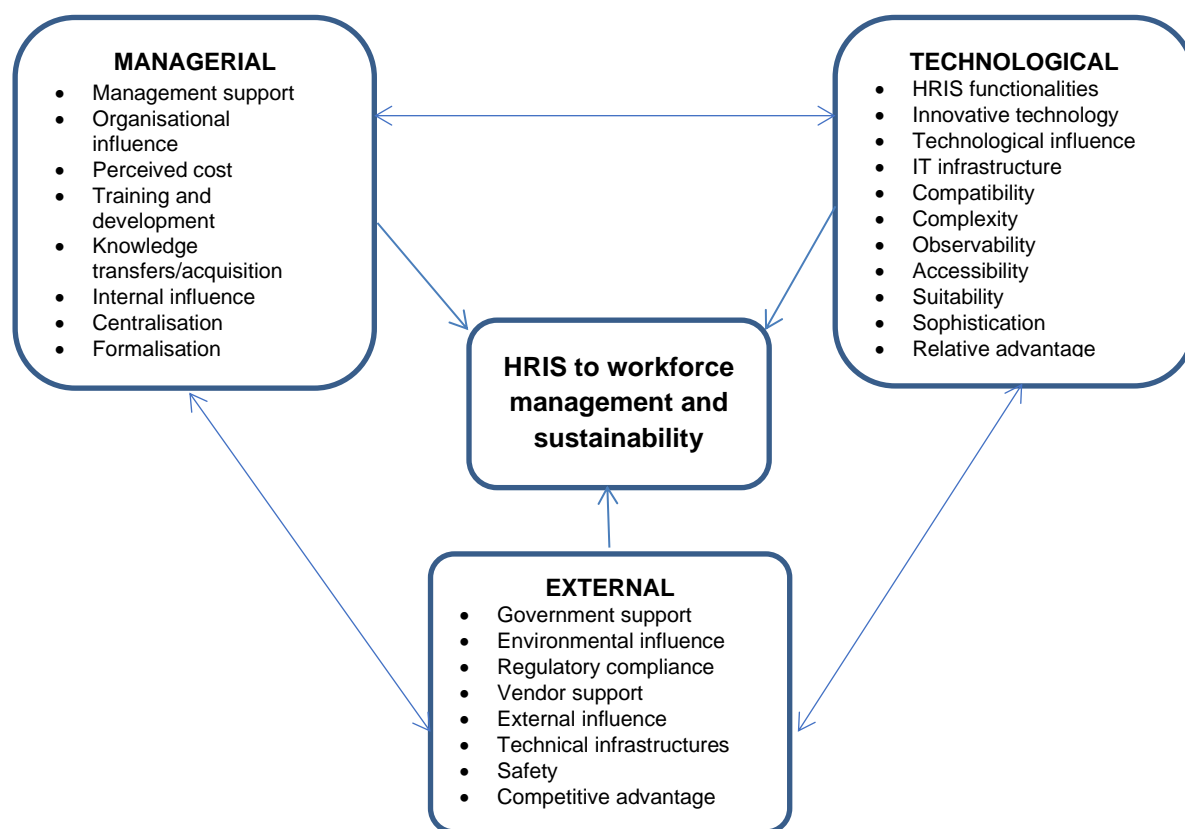
Figure 4.6: Proposed framework on effective HRIS
Adapted from HRIS innovation diffusion theory by Kassim et al. (2012); knowledge-based theory on HRIS by Beulen (2009) and Technology, Organisation and Environment framework on HRIS by Alam et al. (2016).

In Figure 4.6, it was also indicated that a relationship could exist between the managerial, technological, and external factors in different aspects. Such relationships could exist were factors such as technological influence, sufficient HRIS functionalities, the sophistication of the system, and IT infrastructures to name a few, require regulatory compliance, organisational influence, management, and governmental support, to have an effective HRIS usage for workforce management and sustainability. The proposed framework further indicates that effective HRIS cannot be achievable without identifying the relationship and connection existing around the independent variables and how they relate to the dependent variable.

This proposed framework will be further elaborated in chapter 7.

4.10   CHAPTER SUMMARY

This chapter presented the effectiveness of HRIS and its relation to the health sector in SA; it reviewed the impact of using information systems in human resources and the development of the health sector and its benefits. Various studies were reviewed and related to the use of HRIS in the health sector of SA.

HIT and IT adoption to improve HR in the health sector were outlined, and the challenges were also pointed out as they relate to the health sector. The HRH related to HRIS usage in the South African health sector was mentioned, and the issue of dealings concerning the health workforce during the pandemic and the impact on retention were highlighted. HIS awareness in SA was also touched on in this chapter. The lack of understanding of HIS, and lack of effective monitoring of IS and ICT specialists were identified as some of the reasons for defective HIS. DHS transformation in SA was also highlighted, and the WHO vital structural requirements for UHC and SDG in the healthcare for Africa were also highlighted.

HRIS usage in the health sector of SA was highlighted in detail. Further, how HRIS technology impacts workforce recruitment and retention in the health sector was explained critically. The various challenges faced by the health sector inhibiting the use of HRIS were highlighted; the effect of government participation in the use of HRIS for workforce sustenance was also explained. The chapter also pointed out the various steps to follow to strengthen the health sector workforce using HRIS.

Two theories and a framework were explored to understand the premise and potentiality in the effective utilisation of the HRIS foundation. The innovation diffusion theory, knowledge-based theory, and technological, organisational, and environmental framework were adopted for this study to develop a proposed framework. The framework was designed in the context of the health sector in SA, which resonates well with the context of the study. In reconsideration, the combination of the theories/framework provided a comprehensive description and conceptualising factors of effective utilisation of HRIS in the health sector of SA (presented in chapter seven).

The next chapter will focus on the research design and methodology used in the study.

CHAPTER FIVE: RESEARCH DESIGN AND METHODOLOGY

Chapter five – RESEARCH DESIGN AND METHODOLOGY
Introduction
Research philosophy
Research approach
Research strategy
Research design
Research method
Sampling
Data collection
Data analysis
Pilot study
Validity and reliability
Ethics
Delineation of the study
Limitations of the study
Chapter summary
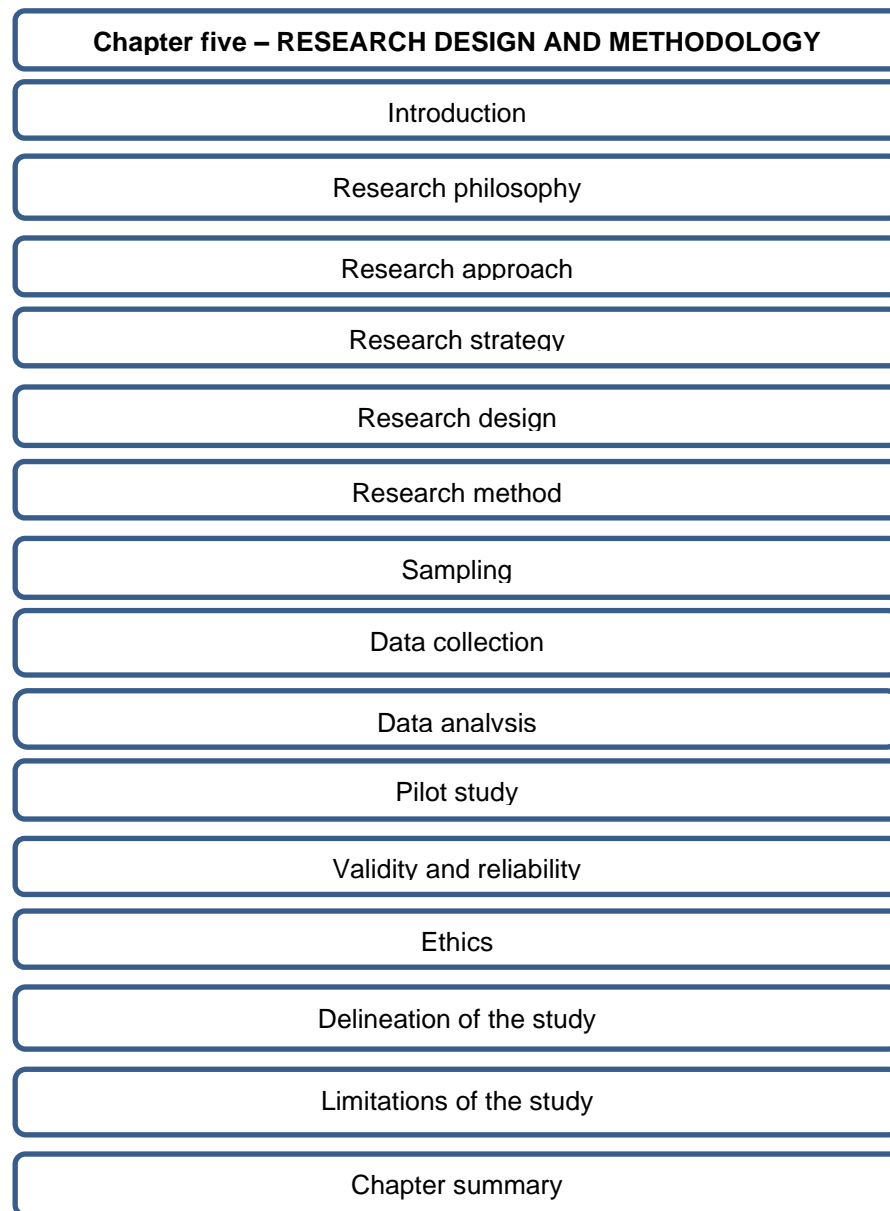
Figure 5.1: Layout of Chapter 5

5.1   INTRODUCTION

The main objective of this study was to determine the primary reasons for the ineffective use of HRIS and its impact on the performance of the public health sector in SA. The pursuit of this main objective necessitated the selection of appropriate philosophy, design, and method.

This chapter begins with a philosophical justification for the research design and method. This is followed by the description of the population and sample. After that, the data collection instruments, and the piloting are described. The chapter also explains the validity, reliability, ethical consideration, and delineation of the study. The chapter concludes with the limitations and a summary of the key takeaways from this chapter.

5.2   RESEARCH PHILOSOPHY

Several research philosophies are available to researchers. These philosophies can deliver the research outcome (Leedy & Ormrod, 2010). However, it is prudent for the researcher to choose the one that fits the purpose of the study (Saunders et al., 2019). The philosophical paradigm underpinning this research is linked to ontology and epistemology.

5.2.1   Ontology

Ontology is defined as "the theory of being which means a situation where humans need to find out what exists as to what is expected to exist in a real-life context" (Saunders et al., 2019:133). Ontology is concerned with clarifying the nature of reality (Izhar, Torabi & Bhatti, 2017). It represents a study of the principle of certainty within the perception of reality. Understanding the nature of reality and gaining clarity on appropriate forms of existence under the notion of how the world operates concerning each specific opinion can be static (Sayeb, Jebri & Ghezala, 2021). Ideally, ontology is reflected as the nature of certainty.

Two notions, objectivism, and subjectivism, inspire the ontological view of the research. These are discussed briefly:

5.2.1.1 Objectivism

Objectivism describes the ontological position that "incorporates the assumptions of the natural sciences, arguing that social reality that we study is external to us and others" (Saunders et al., 2019:810). Objectivism embraces realism, meaning that social entities are similar to physical entities in the real world. Objectivism is dominant in physical and applied sciences research because such research embraces a quantitative and positivist view of reality.

5.2.1.2 *Subjectivism*

Subjectivism is the direct opposite of objectivism and aligns with social sciences and humanities research. It represents an ontological position that "incorporates assumptions of the arts and humanities and also asserts that social reality is made from the perceptions and consequent actions of social actors (people)" (Saunders et al., 2019:818). Subjectivism views the assumptions that social occurrences originate from the awareness and the activity of those social beings that show interest in their existence. In a subjective view, there is a need to observe the circumstances, environments and communication of the social performers to understand the existence of an organisation (Norman & Kabwe, 2015:219). Social phenomena are not stable in a subjective environment; however, the phenomena frequently alter due to the social activity and interface. Perhaps the view of social phenomena is related to subjectivism because subjectivism believes that practices, daily social activities, and personal thought are ways social actors create their reality.

The aim is to apply a mixed method approach to understand how HRIS usage as an IS exists in the management of a skilled workforce in the public health sector. This study holds an ontological objectivist and a subjectivist approach indicating that the circumstances observed can come into existence through the action of humans in developing and reinstating the phenomena observed. Thus, the study is a combination of both objective and subjective views.

5.2.2 Epistemology

Epistemology is the theory of knowledge of understanding what humans know compared to the actual truth (Saunders & Lewis, 2016). Epistemology is defined as "the theory between actual knowledge and what is regarded as good knowledge" (Greener, 2011:4). Epistemology is further referred to as what the world needs to do to produce knowledge of the truth. Ideally, it is the way humans go about their lives to acquire knowledge in the world, which reflects what is applicable and appropriate in the world we live in (Bhattacherjee, 2012; Gerber, 2019).

Essentially, the emphasis is on how humans can gain knowledge and understanding of phenomena, trying to determine the truth and certainty by guiding knowledge from one person to the other. However, epistemological research is conducted through a paradigm that assists in identifying the nature of the necessary information needed by a researcher to conduct a study (Pham, 2018). Therefore, Saunders et al. (2019) argue that a core consideration in determining the suitable epistemological philosophy is in four main paradigms: i) positivism, ii) interpretivism, iii) critical reality, and iv) pragmatism. This study adopts a pragmatist paradigm as explained in the following:

5.2.2.1 *Positivism*

Positivism assumes that knowledge is adequate only when created by practical and verifiable means of substantiation (Terre Blanche et al., 2009). Positivism believes knowledge is produced only from the truth (Pham, 2018). The beliefs and experiences of researchers are insignificant to the research output because they are deemed to be part of the research process (Naris, 2009). Kariuki, Obonyo and Ogutu (2018) agree with Naris (2009), saying that positivism has an intersecting reliance on other types of philosophies and could only be authentic through opinions (quantitative research only). Ideally, it is concerned with recognising mathematical movements in a social occurrence, testing hypotheses, and using the same data analysed to generalise and replicate it in another study (Brydon-Miller, Greenwood & Maguire, 2003; Roberts, 2021).

5.2.2.2 *Interpretivism*

The interpretive paradigm is considered an access to reality that can only be attained through social constructs such as awareness, interactions, and cohesions (Maree, 2008:60). It assists in accepting reality through the meaning people entrust to it and their understanding of themselves (Alasuutari, 1995). The purpose of an interpretive paradigm is to comprehend phenomena subjectively through the thoughtful empirical events in human life (Ryan, 2018). Studies on the Interpretive paradigm are about how people create and connect knowledge in their subjective way, based on their exceptional capabilities and perception related to their logical instinct (Neuman, 2011; Roberts, 2021). A researcher who adopts an interpretive way of thought has the mindset that reality is subjective.

The interpretive paradigm aims not to generalise the population but rather to afford a better acceptance of how humans acquire knowledge in a specific social environment (Roy, Weyman, George & Hudson-Sharp, 2017). An interpretive researcher, unlike the positivist, ignores realistic interpretations of occurrences and builds their denotation of the phenomena by subjectively interpreting the data and meaning of the study to other people. Thus, interpretive people see the world as a complex environment where humans provide the meaning of the situation in which they find themselves. In contrast, positivist people see reality as a general thing that can be measured.

5.2.2.3 Critical realism

The critical realism paradigm holds that the historical creation of truth that does not reflect in the mind of humans, and such a foundation is not accepted as the actual reality of life even if it exists in real life (Saunders et al., 2019:800). Critical realism attempts to change the context of the reality of occurrence. Ideally, it considers history as organised by human creation for social reality, thus aimed at changing reality from its current focus to more of a negative aspect of certainty. A researcher conducting studies on critical realism is not interested in explaining their opinions on a social phenomenon. Still, their aim is critical of the phenomenon focusing on changing the world in a different dimension (Morse, 2015). A critical realism study aims to change society, liberate humans from oppression by exposing myths, and empower them to build a better world for themselves (Dlamini, 2016).

5.2.2.4 Pragmatism

The main postulation of pragmatism is that perceptions are only relevant where they are supported by the action (Saunders & Lewis, 2016). Thus, pragmatism is an analysis of research findings based upon social, moral and practical concerns (Aletaibi, 2016:117). Therefore, it considers the research problem critical. Also, the research questions are meant to be more important than the underlying philosophical assumptions. In this regard, more than one methodology to conduct a study is accepted (Tashakkori & Teddlie, 2003). Pragmatic research embraces mixed method approaches, which originate from Rorty (1982) and Peirce (1984). Pragmatism is a mixed method that depends on the nature of the research that could be adopted to achieve an outcome. In a pragmatic study, the researcher might not state that they used pragmatics; however, the data collection method would specify some features of both positivist and interpretivist approaches (Giacobbi, Poczwardowski & Hager, 2005).

Thus, this study adopted an epistemological philosophy of pragmatism because the study is a mixed method process which requires the combination of both qualitative and quantitative methods of study. It will also allow the researcher to adopt the method he feels is best suited for the study.

5.3   RESEARCH APPROACH

A research approach is regarded as a plan of action that guides the researcher to carry out research efficiently and effectively (Tuffour, 2017:2). However, there are three main types of research approach: i) inductive, ii) deductive, and iii) abductive (Saunders et al., 2019:815). A

research approach signifies that social phenomena could exist independently among individuals of which there is only one truth in life reality. Also, any of the identified research approaches that could be used to produce the findings of new knowledge would be determined by the research method used in the study (qualitative, quantitative or mixed) (Soeker, Heyns, Kaapitirapi, Shoko & Modise, 2021). This study utilises the abductive approach to developing a framework from the existing theories and the framework identified in the literature review are highlighted as follows:

5.3.1 Deductive approach

The deductive approach is "concerned with constructing a philosophy with assumptions (hypothesis) and searching for a test to the validity of the result" (Rubin & Babbie, 2014:68). Ideally, a deductive approach refers to a set of reasoning used to reconstruct an argument. A deductive approach is regarded as the principal approach in natural sciences where philosophy is thoroughly tested in an organised context and according to the population's fundamental laws used to estimate the result (Sugyati, Mariana & Sjoraida, 2018:5). The objective of a deductive researcher is to examine and confirm initial designs and philosophy by utilising new experimental data, which is also called model testing research (Saunders et al., 2009).

5.3.2 Inductive approach

The inductive approach involves developing a theory that gathers objective evidence to build a philosophy from outcomes (Descombe, 2010; Saunders et al., 2019). In an inductive approach, the objective of an inductive researcher is to detect patterns derived from practical suggestions and conclude the results to the philosophy, which is called model building research (Du Plooy-Cilliera et al., 2014). Ideally, an inductive approach is challenging, time-consuming, and needs a researcher's skills and expertise to clarify the participant's experiences and concepts.

5.3.3 Abductive approach

An abductive approach is the "approach to theory development involving collecting data to explore a phenomenon, identify the themes, patterns, and generate a new or modify an existing theory" (Saunders et al., 2019:796). An abductive approach is associated with mixed method research. This approach is a thoughtful construct and critical to advancing knowledge and learning in the research environment (Bhattacherjee, 2012).

Ideally, in a research strategy, modelling is conducted through three different dimensions to achieve specific goals (Gerber, 2019). Models developed within the context of: i) deductive approach are based on theoretical reasoning, ii) the inductive approach is based on empirical reasoning (observations), and iii) the abductive approach is based on the combination of different approaches to arrive at a conclusive model construct (Bryman & Bell, 2015). The researcher intended to combine different models to derive a framework for the study (abductive) (Bhattacherjee, 2012; Neuendorf, 2019).

This study adopted an abductive approach using a partially integrated mixed model research method to modify previously identified models and develop a framework (Das & Ara, 2015). This framework will assist as a guide for effective HRIS in the public health sector of SA. The findings will lead to why HRIS is not used adequately in helping the public health sector manage the skilled workforce.

5.4   RESEARCH STRATEGY

According to the seminal work of Benbasat, Goldstein and Mead (1987:369) in a study on IS, no research strategy is more appropriate than others for all research purposes. The goal of a researcher and the nature of the research impact the selection of the research strategy used (Khoualdi & Basahel, 2014). A research strategy is also regarded as the communication channel between a researcher and the research population as a better understanding of the study and how it could impact the organisation (Mabaso, 2020:90). Thus, a research strategy could be: i) positivist, which includes experiments and surveys, or ii) interpretivism, which include case study, grounded theory, ethnography, and action research (Saunders & Lewis, 2016).

A research strategy (for example, on IS) is characterised by constant changes in technology and innovations, which warrant a case study and survey research strategies as suitable for this study to assist in capturing the effect of HRIS in the public health sector. Different strategies are explained in the following:

5.4.1   Grounded theory

According to Saunders et al. (2019:804), a grounded theory is "a research strategy in which theory is developed from data collected by a series of observations or interviews particularly involving an inductive approach". Thus, a grounded theory deals with developing a new theory, through the data collection techniques and analysis used and helps derive meaning

concerning the study (Glaser & Strauss, 1967; Charmaz, 2017). However, a seminal study by Bryant and Charmaz (2007) stipulates that a grounded theory can be used to refer to the methodology used, method of data collection and the outcome of a research process. This indicates that a grounded theory refers to the data collection technique used, and the method of analysis implemented in a study to generate a new theory.

5.4.2 Experimental approach

Experiments are used in a study that warrants probability with changes in independent variables, which reflects changes in others known as the dependent variables (Saunders & Lewis, 2016). In experimental strategy, predictions are usually referred to as null or alternative hypotheses and are used to oppose research questions. This process gives a researcher the anticipation of whether there is a relationship between variables (Saunders et al., 2009).

5.4.3 Case study

A case study is "an empirical inquiry that investigates a contemporary phenomenon within a real-life context, especially when boundaries between phenomenon and context are not evident" (Yin, 2018:12). However, a case study is described by Saunders et al. (2019:797) as a research strategy involving pragmatic inquiry of a phenomenon within a real-life context, using multiple sources of evidence. Multiple-case strategy is more convincing and vigorous due to the replication and logical sequence of the results (Scupola & Pollich, 2019:8).

Essentially, a multiple case study can examine and discover an organisation's complexity, with thorough consideration applied in the procurement of the desired information (Zikmund, Babin, Carr & Griffin, 2010; Chen et al., 2021). Research is carried out using multiple cases that provide clarity based on the triangulation of evidence. Thus, it intensifies the dependency on the facts and assists to validate the data assembled from other sources (Yin, 2009). Multiple case study research gathers data through several data collection methods such as interviews, document analysis, observations, surveys and longitudinal studies to accept the phenomena being examined and identify the vital data that answers the research questions (Creswell, 2009). According to Yin (2003), there is no generally acceptable number of cases for case-study research; hence a case study could be based on either a single case or multiple cases.

5.4.4 Survey

A survey research strategy involves "the structured collection of data from the sizeable population" (Saunders et al., 2019:818). Ideally, the phrase 'survey' is usually used to describe

quantitative data collection using a questionnaire. However, it also includes other data collection techniques such as structured observation and a semi-structured interview schedule (Rubin & Babbie, 2014). Thus, a survey strategy is usually aligned with the quantitative research method and a deductive research approach (Saunders et al., 2019). It is generally associated with questions such as what, how, where, and why. They usually come with standard questions and answers too. In this study, the quantitative data were collected using a closed-ended Likert scale questionnaire and analysed to generate numerical graphs and charts and using a semi-structured interview schedule in the qualitative method of data collection. This allows the interviewed participants to indicate a yes, no or no idea response to support the interviewed comments in the data collection process. The survey research strategy is also deemed fit for the study.

For this study, a multiple case research strategy was followed. This involved four selected public hospitals in the WCPDHW of SA with proper consent indicating their willingness to participate in the study. They also interviewed purposively skilled health workers, including the HR and IT department workers. A further survey research strategy was followed using graphs, charts, and numerical presentation of data to identify the quantitative response from the data collected and its impact on the study. This strategy was followed to allow the researcher to understand the phenomena better.

5.5   RESEARCH DESIGN

A research design is the drawing or plan that specifies how data relating to a specific study was collected and analysed (Kagehi, 2015). It is referred to as a road map and a set of rules and instructions on how a researcher wishes to reach the aim of the study through the initiation of suitable research problems and questions (Babbie & Mouton, 2001:75). Terre Blanche et al. (2009:34) define a research design as "a strategic framework for action that serves as a bridge between research questions and implementation of the research". Research design initiates the end-product of research by picturing the initial plan, the expected outcome, and the process to follow in addressing the research questions. It is also referred to as the overall strategy utilised to carry out research that explains the concise and coherent plan to tackle conventional research questions through a properly designed data collection, interpretation, analysis and discussion process (Quinlan, 2011).

Essentially there are three major types of research design which, according to Kothari (2004), Mokoena (2019) as well as Asfahani (2021), are: i) explanatory, ii) descriptive, and iii) exploratory research designs. This study adopts descriptive and exploratory research designs

used to identify the reasons for ineffective utilisation of HRIS in the public health sector are explained in the following:

5.5.1 Explanatory design

The primary purpose of an explanatory design is to offer casual descriptions of a situation. It focuses on a crisis or problem which explains a relationship between fractions and variables (Baskerville & Pries-Heje, 2010; Saunders et al., 2019). An explanatory research design is unsuitable for a study that does not require statistical measurements and the relationship between variables and hypotheses. Thus, an explanatory research design is used to describe the objective view of a phenomenon.

5.5.2 Descriptive design

Descriptive design is used to describe the characteristics of a population or phenomenon under study and produce an accurate representation of events or situations (Lambert & Lambert, 2013; Saunders et al., 2019). The use of descriptive design could be extended to the gathering and labelling of the quantitative responses and the demographic profile of participants, such as their years of service, gender, and profession, amongst others (Boskovic et al., 2021). The descriptive design is suitable for a study of this kind because it deals with close-ended questionnaires and the participants' demographics by describing the phenomena in an appropriate pattern.

5.5.3 Exploratory design

Exploratory research aims to seek new insight into a phenomenon by asking questions to assess the phenomenon in a new dimension (Brandt, 2006; Saunders et al., 2019). Exploratory research design clarifies the rigorous nature of identified research problems and additional research areas that require attention. An exploratory research design was founded on the philosophical perspective of the investigation and the research paradigm that this study followed. Content analyses of keywords/themes were used to explore the identified phenomenon.

Therefore the researcher chose the descriptive and exploratory research design following the methodological practices of Beadles II, Lowery and Johns (2005), Masum, Bhuiyan and Kabir (2013), Bae and Choi (2016), Kakade and Sharma (2019), and Hamod and Majeed (2021). They examined HRIS-related cases in other sectors, countries, and regions. The study will explore the effectiveness of HRIS usage in the public health sector of SA.

5.6   RESEARCH METHOD

5.6.1   Introduction

A research methodology is defined by Babbie and Mouton (2001:75) as "the systematic, methodological and accurate form of executing research". Research methodology reflects and illuminates the rationality behind the procedures followed to achieve expected results (Welman et al., 2006:2). It is essential in preparing, arranging and moving the study towards certainty, fairness and rationality (Sharma, 2017). There are three main research methods, namely qualitative, quantitative, and mixed methods. However, selected methods are helpful in a study (Rubin & Babbie, 2014:86). This study made use of a mixed model research method as explained in the following.

5.6.2   Qualitative research method

The qualitative method is defined as "a range of interpretive techniques that seek to describe, decode and translate the terms in a social environment" (Rubin & Babbie, 2014:79). The method gives a better understanding of complex situations and works in an exploratory environment that allows researchers to build theories from the bottom up (Brynard & Hanekom, 2006; Leedy & Ormrod, 2010). Essentially, the qualitative method assists a researcher to have an idea of what happens in the mind of the participants. Thus, a qualitative method will require comprehensive interviews of the purposively selected participants and how they respond with an open mind to interact conveniently with the researcher (Morse & McEvoy, 2014; Koppel & Telles, 2020).

5.6.3   Quantitative research method

Quantitative research is defined as "a systematic process of investigating a research problem using structured questions, also where a larger number of responses are involved" (Rubin & Babbie, 2014:79). Ideally, it involves using questionnaires, surveys and numerical statistics for data collection and analysis (Singh, 2007; Gathungu, 2018). In a quantitative method, questionnaires are commonly used. Though they do not give comprehensive answers to most questions, they serve as the easiest and most convenient data collection method (Singleton & Straits, 2005; Merriel et al., 2021). Therefore, the quantitative method allows the researcher to use statistical interpretations of the data analysis. The quantitative method will enable data collection from a large sample of participants; it also gives room for flexibility in data collection

and analysis. Essentially, it tends to focus on a broader view based on the assessment of theory that comprises frequencies and variables controlled by the researcher (Coolican, 2017).

5.6.4   Mixed method

A mixed method approach combines qualitative and quantitative research methods (Tesha, 2020:17). Mixed method research can be strategic so that the outcomes and analysis of the initial quantitative stage will lead to the advent of the qualitative phase or vice versa (Logan, 2019:29). There are three types of mixed methods: i) mono method is a single method that is either a quantitative or qualitative method of data collection and analysis procedure (Gurmessa, 2019), ii) multiple methods denote a mixture of two or more research methods of data collection and analysis procedures considered more than one collective data analysis procedure (Fairuzzabadi et al., 2021), iii) is a division between multiple methods of either the quantitative or qualitative techniques to collect multiple sources of data that are exclusive from one another, and then mixed in the same study in conclusion (Saunders & Lewis, 2016).

According to Saunders et al. (2019:185), the reasons why mixed method research is used are for better: i) initiation, ii) facilitation, iii) complementarity, iv) interpretation, v) generalisation, vi) diversity, vii) problem-solving, viii) focus, ix) triangulation, and x) confidence. This study adopted multiple methods to have reasonable data collection practice sensitivity. The data were collected through a semi-structured interview schedule from purposively selected skilled health workers, including HR and IT staff. Other participants that could not be interviewed, completed 5-point Likert scale questionnaires and returned them to the researcher (Wairimu & Ndeto, 2019).

5.6.4.1   Approaches to mixed method research

According to Saunders et al. (2019), there are two main mixed method approaches: i) mixed method and ii) mixed model. This study follows a mixed model research method as explained in the following:

5.6.4.1.1   Mixed method research approach

This is a method that gathers both quantitative and qualitative data either simultaneously or consecutively and scrutinises the data differently with one of the outcomes being higher than the other, and the results are not combined in any way to arrive at the conclusive result (Appiagyei et al., 2014:3).

5.6.4.1.2   *Mixed model research approach*

This method gathers both quantitative and qualitative data and makes a conclusive result by combining the data (Ungsutharo, Siriwan & Ruangsanka, 2021:9428). This method can measure qualitative data into numeric encryptions for numerical study or analyse quantitative data into graphic descriptions to be evaluated qualitatively. The mixed model research approach that was adopted in this study is explained in Figure 5.2:
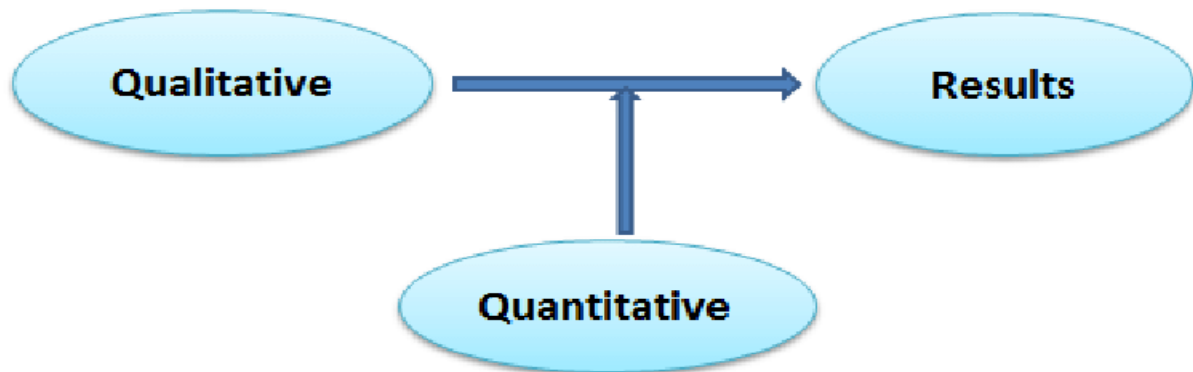
Figure 5.2: Mixed model research using an exploratory research design
(Tashakkori & Teddlie, 2006:6)

Figure 5.2 shows that this study adopted mixed model research. This approach allowed the combination of the data from both methods (qualitative and quantitative) simultaneously in the discussion to make a conclusive result with both types of data combined. The mixed model research approach offers a broader arrangement of research methods to better understand effective IS in the health sector (Logan, 2019). Essentially, two methods of data collection (interview and questionnaire) were implemented for this study to explore the benefit of the data and information derived from the study, where unexpected research results can be unveiled (Flick, 2010; Tulu et al., 2021). This method was used to obtain a clear view of the participants' thoughts regarding the effectiveness of HRIS in the public health sector of SA.

5.6.5   Triangulation

Triangulation is a research method used in multiple sources of data collection to survey a situation, which is done either concurrently or serially to have an accurate result for the study (Tashakkori & Teddlie, 2003; Boone, 2021). According to Saunders et al. (2019:819), triangulation uses two or more independent sources of information or data collection methods within a study to help guarantee that the information obtained tells a researcher what they

believe the information is portraying. It consists of using more than one source of data collection because every data collection method addresses a different facet of the study, and triangulation does give confidence and entirety to the study conclusion (Willis, 2007; Gardeazabal et al., 2021).

This method allows a researcher to capture a broader, more complete, and detailed representation by revealing all the study facets. However, one of the most important reasons for using triangulation is that it eliminates ambiguity from the data, which gives a researcher more confidence in the results (Simons, 2009; Logan, 2019). Although triangulation is expensive, it provides the researcher with reliable and valid results (Roberts, 2021:25).

Figure 5.3 indicates a triangulation research method adopted in this study, using an experimental research design, which shows how the integration of qualitative and quantitative analyses of the data.
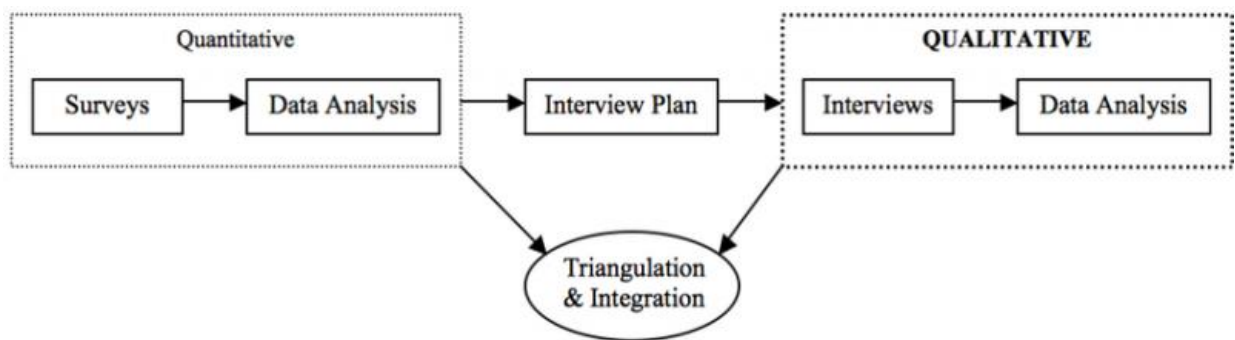
Figure 5.3: A triangulation framework using an exploratory research design
(Tashakkori & Teddlie, 2003:674)

Figure 5.3 shows that the researcher initiated a data collection process with the quantitative method (questionnaire) and an additional qualitative method (interview) to support the former. This makes it possible to collect sufficient data and information to finalise the study.

5.7   SAMPLING

"Sampling is selecting a group from a sample size" (Rubin & Babbie, 2014:381). Sampling is a list of all the entities in a population from which a sample will be drawn. Essentially, sampling for this study was taken from four selected public hospitals in the WCPDHW of SA. However, the sampled population was adequate to yield useable information. A sample frame was

drawn from each hospital. 10% of assurance recesses were used for the selected population. Table 5.2 shows that 41 interviews were conducted, and 46 questionnaires were completed and collected from the four selected public hospitals, which means that data was collected from a total of 87 people to guarantee the correctness and authenticity of the study. All the participants in this study were employees of the four selected public hospitals. The participants are categorised in Table 5.2 of section 5.7.4.

5.7.1 Unit of analysis

According to Rubin and Babbie (2014:673), the unit of analysis is the "what or whom that is being studied". Essentially, in social science research, the unit of analysis is usually referred to as the organisation participating in the study. Interestingly, Saunders et al. (2019:171) also indicate that social scientists refer to the enterprise that participates in a study as the unit of analysis. However, the unit of analysis is defined according to Welman, Kruger and Mitchell (2006:52) as "the study of objects which consists of groups, departments and organisations". The focus of this study was identified as the effectiveness of HRISs in the public health sector of SA. The unit of analysis of the study was the four selected public hospitals in the WCPDHW of SA as listed in Table 5.1:

Table 5.1: List of public hospitals selected for the study
(Department of Health (SA), 2021)

List of the category of healthcare facilities in WCPDHW of SA	List of hospitals that participated in the study identified in codes
1. Clinics / Community Day Hospitals (C/CDH)	i. DS Hospital ii. ER Hospital iii. RT Hospital
2. District / Provincially Aided Hospitals (D/PAH)	i. MP Hospital

The readiness and enthusiasm to participate significantly influenced the selection of the hospitals. Many contacted hospitals were not willing to participate, but in some cases where the hospitals agreed to participate, most of the workers were not willing to do so because they saw no direct benefit from the research study. Consequently, the research time frame was affected and stopped due to the difficulty in findings participants would be interested in those selected hospitals (Prasad, 2020). COVID-19 also exaggerated the situation. The lack of interest shown by some skilled workers in the designated public hospitals and the emergence of COVID-19 resulted in the collection of data from only one District/Provincially Aided Hospital (D/PAH) and three Clinic/Community Day Hospitals (C/CDH) in the WCPDHW of SA as indicated in Table 5.1.

5.7.2 Unit of observation

The unit of observation refers to the selected participants in the study and is also known as the subsection of the population (Welman et al., 2006; Wairimu & Ndeto, 2019). The participants were purposively selected for the study from the four selected public hospitals. A total of 41 people were interviewed, and 46 people completed the questionnaires, which is a total of 87 people who were purposively selected and participated from the selected public hospitals in the WCPDHW of SA. The readiness, passion, level of education, years of experience and position were important influences in choosing the participants. Many people whom the researcher approached were not keen to participate due to their opinion that they would not benefit personally from the study.

5.7.3 Sampling technique

A sample is the subset of the population that participates in a study as it will not be possible for a researcher to use the entire body of employees in the selected public hospitals (Welman et al., 2006; Morse & Cheek, 2014). Rubin and Babbie (2014:454) are also of the opinion that sampling is about selecting a suitable section to denote the targeted population because of the rate and onerousness of choosing a whole population for a study within a definite environment are unrealistic. Ideally, sampling can either be in the form of i) probability sampling, which is generally associated with quantitative research methods, or ii) non-probability sampling, in which the choice is based on qualitative research. It is also concerned with the sample type required to justify the study (Flick, 2010; Okwang, 2020). Figure 5.4 shows the different types of sampling techniques. Thus, this study adopts a non-probability, purposive sampling technique to select the participants in the selected public hospitals as explained in the following:
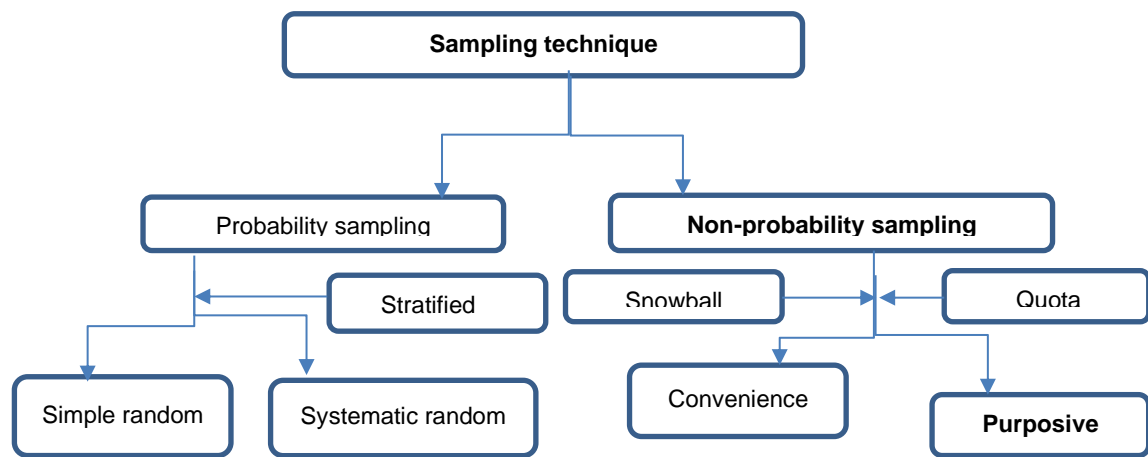
Figure 5.4: Sampling methods
(Saunders et al., 2019:297)

Access to the database and information was aided by an arrangement between the researcher and the WCPDHW. This provided the researcher broader range of probable samples of the population in all sections of the hospitals within the scope and their HRIS usage in the public health sector. The study's sampling was based on non-probability purposively selected participants in the four public hospitals. The focal benchmark for choosing a participant was based on their interest, readiness, knowledge, and eagerness to participate in the study irrespective of whether they were technologically skilled or not and if they used IS such as HRIS. This was because they were interested in seeing changes in the way things are done in the public hospitals of SA.

As mentioned earlier, the sampling technique used for this study was a non-probability sampling method based on mixed methods of enquiry through a judgmental (purposive) technique (Naderifar et al., 2016). This sampling technique offers unlikely alternative procedures to create a sample grounded on a subjective decision (Alam et al., 2016). Purposive sampling permits the researcher's own decision to select the best likely units of analysis, to suitably convey the anticipated outcomes to the research questions and to accomplish the research intentions (Koesnell, Bester & Niesing, 2019). Non-probability sampling is considered the most suitable method due to the time limits, funds, convenience, the nature of the study and the kind of organisations involved (public health sector).

5.7.4   Sample size

For this study, a purposive non-probability random sample was initiated, and a total of 87 workers from four public hospitals participated in the study. Table 5.2 shows the participants

and their area of specialisation/positions in those public hospitals. However, the next chapter will indicate the demographics of the selected participants, which will include their years of experience, qualifications, and age, amongst others. The selected participants were deemed fit, qualified, and knowledgeable to provide the researcher's reliable information to conduct the study. The most important part of the sampling was the need for different opinions of the participants regarding the effective use of HRIS in the public health sector and how such an IS impacted their performance in general. Table 5.2 shows the list of the participants, and their areas of specialisation/position as follows:

Table 5.2: List of the category of participants in both methods
Compiled by the researcher

S/NO	Category of participants	Total interviews	Total questionnaires	Cumulative total
1	Hospital Managers	2	2	4
2	HR/Admin Managers	1	2	3
3	HR/Admin Assistants	5	1	6
4	IT Managers	1	1	2
5	IT Assistants	1	1	2
6	Medical Doctors	5	6	11
7	Senior Nurses	12	11	23
8	Junior Nurses	3	3	6
9	Pharmacists	3	7	10
10	Pharmacy Assistants	1	3	4
11	Radiographers	3	1	4
12	Radiography Assistants	0	1	1
13	Community Service Workers	1	2	3
14	Data Capturer	1	0	1
15	Assistant to PA	1	0	1
16	Social Workers	1	1	2
17	Occupational Therapists	0	2	2
18	Laboratory Technician	0	1	1
19	Phycologist	0	1	1
	TOTAL	**41**	**46**	**87**

There is a notion that data collection and analysis of a study can be generally notorious if the response rate is too short and also the data collected is insufficient (Vaismoradi, Jones, Turunen & Snelgrove, 2016). The truncated response rate and the number of completed questionnaires returned discouraged the quantitative outcomes from being presented in a more generalised perspective (Boateng, 2007; Khan et al., 2017; Nwadiuko et al., 2021; Booker, Austin & Balasubramanian, 2021). However, the data collected for the study was sufficient to analyse and conclude the investigation.

5.8   DATA COLLECTION

Data collection refers to gathering data and information for a study from selected sources which include organisation, population, and other sources (Babbie, 2010; Saunders et al., 2009). However, the data for this study was collected from multiple sources, which include questionnaires and interviews. A convergent-parallel approach was used from different but complementary sources on the same phenomenon during the data collection method. This approach allowed the researcher to validate the data by combining both the quantitative and qualitative results simultaneously.

A pilot study was carried out between the researcher and the selected senior staff members of the selected public hospitals to identify significant facts that would be important to the study (Ukandu, 2015:86). The study was conducted using a mixed model, semi-structured interviews, and multiple types. 5-point, Likert scale questionnaires were prepared for the selected participants (Nthiga & Nyang'au, 2021).

5.8.1   Data collection instruments

This study made use of primary and secondary data collection instruments, primary data (semi-structured interview schedule and Likert scale questionnaire), the secondary data (content analysis) to collate the data used (Meyer, 2020).

5.8.1.1 *Semi-structured interview schedule*

An interview is a way to find out whatever is on someone's mind regarding the state they find themselves in (King & Horrocks, 2010:42). An interview in a study is based on a qualitative method categorised on daily life discussion. It is discussions with reasons, aims, and objectives that are distinct and organised by a researcher in a study (Lincoln & Denzin, 2005:869). Research interviews can be beneficial to a study in that they assist in acquiring information about participants' experiences in the study. In this study, face-to-face interviews of about 25 minutes each were conducted, depending on the person's position and schedule (Moshidi, Malema, Muthelo & Mothiba, 2021).

The purpose of conducting interviews was for the researcher to have a clear view and determine if the selected public hospitals have HRIS in place. Also, it gave the researcher a means of finding out if all the skilled health workers, irrespective of their position and department in the hospitals, have access to HRIS. The weakness in using interviews is the problem of locating and convincing the selected participants. They usually think of the benefits

accruing from the study. Their work schedule is also considered before they can be interested in sacrificing about 25 minutes of their working time to participate in the study. To escape from such a situation, the researcher booked appointments at various times, days, and months. Scheduled appointments were made through emails, telephone calls, and physical visits to each of the purposively selected participants before the interviews were conducted.

Semi-structured open-ended interview schedule questions were used in the study (Appendix A), enabling the researcher to maintain uniformity throughout the interview process and be in charge of the entire process (Sapsford & Jupp, 2006:99). The interview method was employed as it is flexible, and questions that might have been misinterpreted could be rephrased and simplified immediately (Muthoka, 2016:70). An audio recorder was used to record the interviews, and notes were also taken during the interview process with signed permission from the participants (Boone, 2021:44).

5.8.1.2 *Likert scale questionnaire*

A closed-ended Likert scale questionnaire was given, with 'strongly agree' to 'disagree strongly' applied to quantify the levels of the responses (Likert, 1932; Barua, 2013), to participants who were not interviewed to complete at their convenience (Appendix B). The questionnaires were assembled responsibly to ensure that the appropriate information was obtained and comprised a list of possible responses that the participants could select from. Communication through emails, telephone calls and several meetings were held between the researcher and the hospital managers of the selected hospitals. Together, they developed a roster on how to administer the questionnaires to the purposively selected participants involved.

Questionnaires were given to the participants who were not among those interviewed in the selected hospitals. Initially, 200 questionnaires were distributed, and later another additional 30 questionnaires were distributed the second time to the four public hospitals, which is a total of 230 questionnaires were distributed for the study. The additional 30 questionnaires distributed were due to the difficulty and negative complaints of misplacement of the previous questionnaires by some of the participants. This was also due to the emergence of the COVID-19 pandemic in data collection, which affected the study. However, 46 questionnaires were completed and returned, and the rest were never returned. The returning response rate was 20%. The demographics of the participants were the first part of the questionnaire, which consisted of their qualification, age, gender, position, title, and years of service. The specific questions relating to the study followed.

The questionnaires were hand-delivered to the participants in their various hospitals through the hospital managers. The researcher himself distributed some questionnaires, and such visits were based on appointments. All the participants were consulted during working hours and were given enough time to complete the questionnaire for high response rate attainment (Ali, Younas & Saeed, 2016:3645). Usually, the participants were given three weeks to complete the questionnaire because of the high workload and increase in the number of patients in that data collection period due to COVID-19. It took the researcher over a year to administer and collect the questionnaires.

The seminal work of Babbie and Mouton (2001) mentions that using questionnaires for data collection is a cheap and quick way to collect data, makes large samples feasible, and is also useful when dealing with complex situations. Also, it unveils numerical data that can be measured. The aim of using a questionnaire in this study is to identify the frequency variance from the participants' opinions and pair it with the response from the interviews to assist in simplifying the results (Siwakoti, 2020).

5.8.1.3. Content analysis

Content analysis is also referred to as a documentary review of secondary data and information from previous researchers to conduct a study (Vaismoradi, Turunen & Bondas, 2013). It is the foundation of the document review of a good study, even though researchers are required as a compulsory measure to collect primary data for their study. It is rare to find a study that does not have previous research done by other researchers. Content analysis used previous documentary research as the secondary data collection instrument in this study. This process makes it relevant for the researcher to avoid the repetition of prior studies. Rather, it assists in identifying gaps in previous research and non-researched problems. In this study, the researcher used government reports, WHO reports, healthcare reports, journal publications, newspaper articles, working papers, thesis, and dissertations for content analysis on HRIS in the health sector.

5.8.2 The period of the data collection process

The data collection process started at the beginning of February 2020. The interviews were being conducted, and at the same time, questionnaires were distributed to the selected participants. The interviews and questionnaires were expected to be completed within four months (February 2020 - May 2020). However, due to the COVID-19 pandemic, the data collection stretched out for over a year. This data collection process continued until everything was put on hold a few weeks before the SA national lockdown on 27 March 2020 (McIntosh et

al., 2021). After the lockdown, the researcher continued from where they stopped the best way, they could on the whole data collection process. The interviews, questionnaire distribution, and collection process lasted until the end of March 2021. However, the researcher was busy analysing the data immediately after being collected to meet the deadline of the study period.

5.9   DATA ANALYSIS

The previous section discussed the methods employed to collect data, and this section will discuss the method used to analyse the data collected. Data analysis is the procedure used to analyse data collected and transform it into a meaningful explanation (Greener, 2011). Studies have shown that data collected without further processing cannot respond to a research problem. For the value of the data collected to be realised, it must be analysed and interpreted accordingly (Skilling & Sivia, 2006). Data analysis permits the researcher to determine the best path to follow, and the choice is centred on the analysis and interpretation of the data (Rubin & Babbie, 2014). The data and information were collected for the study using both interviews and questionnaires, which were later analysed in the process using ATLAS.ti and SPSS software as explained:

5.9.1   Qualitative data analysis

Saunders et al. (2019:564) defined qualitative data analysis in research as the "reasoning and argumentation that is not based simply on statistical relations between variables by which certain objects or observation units are described". The qualitative analysis aims to assess responses to open-ended interview questions and plays a vital role in providing reliable research solutions (Saunders et al., 2019). According to Stake (2006), qualitative data analysis allows the simplicity of equating results between different outcomes. There are various types of software used to analyse qualitative data. However, this study used ATLAS.ti (Smit, 2002; Neuendorf, 2019).

ATLAS.ti is computer-assisted qualitative data analysis software (CAQDAS) used to analyse qualitative data to facilitate and advance qualitative analysis (Scales, 2013:134). While thematic analysis recognises and categorises resemblances and variances of known codes and then apportions them into themes, it also presents a sensitivity map based on the transcribed texts' recognised themes (Neuendorf, 2019). Qualitative analysis is categorised into six phases known as: a) familiarisation with data, b) generating initial codes, c) searching

for themes, d) reviewing themes, e) defining themes, and f) producing a report (Vaismoradi et al., 2016).

The data collection processing was initially started by classifying and capturing all the data collected into a database. All audio recording and interview guide notes were labelled properly, coded per hospitals and participants, and filed automatically on the hard drive for recovery in case of unintentional destruction, loss, or theft of study documents. The collaborative nature of the data collection and analysis of the research study enabled the researcher to identify and picture vital evolving outlines, themes and connections in the data collected (Campbell, 2014; Zamawe, 2015).

Forty-one interviews were conducted in the selected public hospitals. The interviews were afterwards manually transcribed by the researcher into text in a Microsoft Word document; reviewing the transcription helped the researcher become acquainted with the responses from the interviews and create meaningful thoughts concerning the questions and answers (Saunders et al., 2019). After the transcription, the data was then grouped into similar concepts (Appendix N), and the recognised keywords were highlighted and coded according to their similar meaning (Appendix L). This form of qualitative data analysis guided the researcher through from data to all the information concerning the study.

Codes are described as labels or signs used to recognise units of important information and then assigned to the descriptive or inferential data gathered during the study (Greenfield, 2002; Witter et al., 2016:4). Thus, codes are usually linked to portions of changeable words, phrases, sentences or even whole paragraphs, and also could be either connected or not to a particular setting (Rossman & Marshall, 2010).

Qualitative data can be examined using the ATLAS.ti analysis coding structure. This is done by studying all data carefully, briefly summarising all of the data collected, highlighting all the groups that were identified in the data, then aligning key concepts into themes and identifying key themes according to their appearances (Bazeley & Jackson, 2013). Adu (2021) supports the use of ATLAS.ti in this study by mentioning that the method teaches the researcher how to take a glance at the transcribed data to identify themes that arose and detect repetitive and comparable themes through the codes.

In this study, the summary of the qualitative data analysis was identified through the ATLAS.ti software using codes to obtain the emerging keywords/themes used in discussing the findings according to the research and sub-research questions.

5.9.2   Quantitative data analysis

The data collection tool used to collect the quantitative data is known as multiple-type closed-ended 5-point Likert-scale questionnaires (Barua, 2013). The statistical package used to analyse the data was the Statistical Package for Social Science (SPSS). The responses from the questionnaire were captured in an Excel Spreadsheet and then were later keyed into the SPSS data software sheet (Appendix M). The demographic outlines of the participants were taken into consideration to determine the demographic structure of the sample. In SPSS, a survey analysis technique was conducted through a simple frequency count, using categorical variables to statistically analyse the descriptive data, thereby producing the quantitative results in tables and charts.

Quantitative data analysis provided a priceless summary of potential connections between the effective use of HRIS and its benefit to the public health sector for performance purposes and other benefits. Statistical inferences were used in this study to draw suggestions from the samples that were collected from the quantitative population. The researcher used descriptive statistics to scrutinise and understand data in a significant manner, showing frequencies, percentages, and means (Kum, 2018). This procedure included other methods to enhance understanding of the contents of the data (Maree, 2007).

The questionnaires were given to the purposively selected participants in the four selected public hospitals by hand through the hospital managers and the researcher himself. Forty-six out of 230 were completed and handed back to the researcher. The survey questions were grouped under different categories. From the problem statement, three research questions were developed. Each of the research questions had two sub-research questions. Each sub-research question had a series of questions to be answered.

The data was analysed and discussed by grouping them according to the research questions and sub-research questions into which the questions were categorised accordingly. A descriptive method was used as the research design to enable deeper data analysis. The analysis was expressed through tables, graphs, bars, and pie charts showing the varying percentages from the various answers to the questions according to the sub-research and research questions. A summarised answer to each research question was accomplished (Morse & McEvoy, 2014). The quantitative questions were answered to ascertain the knowledge of the participants regarding quantitative measurement of the effect of HRIS usage in the public health sector and the general perception of skilled health workers regarding HRIS to support the qualitative data analysis.

5.10   PILOT STUDY

According to Yin (2003:79), "a pilot study is an important part of the quantitative research process". The questionnaire for the quantitative study was pre-tested with four participants from each selected public hospital. These participants were from various specialisation/positions such as HR and IT staff, nurses and doctors (Cooper & Schindler, 2006; Ondari, Sang & Gitahi, 2019). A total of 16 persons were selected from all the hospitals. After the pilot study, it was discovered that some vital information had been omitted from the questionnaire. Such information was included before the distribution to the selected population. At the same time, biased questions were rephrased to accommodate all the selected participant's feelings and thoughts.

The researcher also gave copies of the semi-structured interview schedule to three of the senior staff members amongst the skilled health workers. This sample included people in HR, IT, and skilled health workers from each of the selected hospitals to review and in the process; some questions were rephrased to make sure that the interview questions were understandable to the participants. A total of twelve persons were involved in all the selected hospitals for a pilot study. Their responses were in line with the required data for the study. Also, further corrections were made at the initial stage of the interview, where more clarity was made in the schedule to simplify the questions.

5.11   VALIDITY AND RELIABILITY

A good psychometric test, known as Psychometric Properties, was carried out on the study's reliability, validity, and norms to ensure that the study scaled through the process of authenticity (Golafshani, 2003; Hlayisi, 2019). This was done by testing one of the data collection methods used, applying it repeatedly to the same study, and seeing if the results were similar (Babbie, 2013). According to Babbie (2007:145), psychometric properties are defined "as the quality of measurement techniques which suggests that the same data was collected each time in repeated observations of the same phenomenon". The validity and reliability of the study were thus effectively tested (Bryman, 2004).

5.11.1 Validity

Validity is referred to as the legitimacy of the finality and conclusion of a study (Knox, 2004:119). Babbie (2013:154) defined validity "as a term that describes a measurement that precisely reflects the concepts it intends to measure". Murithi (2015:28) also defines validity as the "accuracy and meaningfulness of inference based on research results". The validity of this

study was established by forming the sequence of suggestions during the data collection process and presenting information through a draft of the study for evaluation (Yassin & Obeidat, 2020). The validity of the study was tested through a proposal submission and defence process at the Higher Degree Committee (HDC) of the Cape Peninsula University of Technology (CPUT), at which this study was undertaken. The project was approved as suitable for Doctorate Degree in Informatics based on the study's contribution to the body of knowledge in the research world.

This study has accomplished its intended purpose, to propose guidelines and a framework for the effective utilisation of HRIS in the public health sector of SA. To clarify the purpose of the study, the researcher involved certain stakeholders. These included HR and IT personnel, hospital managers and skilled health workers (doctors, nurses, pharmacists, radiographers, community service managers, social workers, laboratory technicians, occupational therapists, psychologists) and other vital health workers in the selected public hospitals to participate in the study (Table 5.2). The validity methods that were engaged for this study consisted of content and construct validity, as discussed.

5.11.1.1 Content validity

Content validity enables data collected for a study to be reliable in representing the specific content of a particular concept (Agoi, 2016:59). This study adopted content validity, which is the level of the quantifying mechanism that provides suitable handling of the subject under investigation (Murithi, 2015). This study also used content validity to scrutinise the legitimacy of the data tools to see if they would answer the research questions. However, to initiate content validity, it was necessary to make alterations and additions to the research instruments, which was done through discussions and dialogue with the supervisors for effective study result accomplishment. Content validity was used to quantify the participants' responses in the study.

5.11.1.2 Construct validity

Construct validity refers to "the degree to which a measure relates to other variables as expected within a system of theoretical relationships, and as reflected by the degree of its convergent and discriminant validity" (Rubin & Babbie, 2014:661). It is regarded as an instrument used to measure the actual time of initiating a study to the time of developing the theoretical or conceptual framework (Kovane, 2015; Mokoena, 2019). In construct validity, the instruments used in the study are referred to only for that construct. The questionnaire was

constructed to align with what the study intended to achieve. The researcher ensured that the participants were purposively selected from the selected public hospitals in the WCPDHW of SA only.

Interviews were conducted to improve the quality of the study. The questions asked in the interviews and the questionnaires were cautiously phrased and considered to make sure that the study questions, aims, and objectives were highlighted in the questions to be in line with the conclusiveness of the study. The supervisors also reviewed the questions in the interview schedule and questionnaire for validity purposes. This was to ensure that respondents did not experience any difficulties in reacting to the questions. The reliability of the study was also measured.

5.11.2 Reliability

Reliability served as guidance for the design and methodological approach used for this study (Louw & Steyn, 2021:1). The reliability of the findings refer to the collection and gathering of literature, articles, publications, and books that were reviewed to define the study's problem statement, aims, and objectives (Golafshani, 2003; Wardlaw, 2019). This process gave the researcher insight into the procedural and theoretic gaps of the previous studies within this field. The questions asked in both the interviews and the surveys were aligned to ensure accuracy, reliability, and consistency in the findings.

Reliability methods were employed in this study; in the procedure of selecting the hospitals for the study, the researcher applied for ten public hospitals in the WCPDHW of SA, and four hospitals were approved (Appendix G – J). Nevertheless, the sample size used for the study was explicitly the same among the hospitals to ensure a reliable illustration of the larger population's interpretations and thoughts.

Finally, the population that participated in the study went through a similar purposive selection process. This procedure was initiated to guarantee the correctness of the data collected by certifying the findings' correctness, reliability, and authenticity.

5.12   ETHICS

Ethics is described as a mutual contract that is communal amongst researchers about what is appropriate and inappropriate in a logical inquest (Babbie, 2010:64). Ethics is a contract between the researcher and the participants of a study on issues relating to the honest and

proper manner of inquiry. The participants could have the attentiveness and self-assurance to participate in the study (Boatright, 2000). The researcher is expected to be aware of some ethical issues relating to research and inform the participants of such issues (Greener, 2011). Such ethical issues, according to Leedy and Ormrod (2010:101) are: i) voluntary participation, ii) no harm to the participants, iii) anonymity, iv) confidentiality, v) no deception, vi) beneficence, vii) justice, viii) informed consent, and ix) the right to privacy. The researcher made sure that these identified ethical issues were strictly observed and informed consent was obtained from the health authorities and the individual participants.

The researcher received ethics approval first from the Faculty of Informatics and Design (FID) at CPUT, followed by the Faculty of Health and Wellness (H&W) and then CPUT itself, to conduct the study (Appendix D–F). Additionally, the researcher applied for permission to conduct the study in ten public hospitals from the WCPDHW of SA. However, only four public hospitals were approved in Cape Town. Consent letters were approved by those public hospitals through the WCPDHW of SA after countless emails and correspondence (Appendix G–J). The researcher made numerous telephone calls and several visits to the managers of the selected hospitals for discussions and to highlight the purpose and objective of the study and how they could participate in the study. Individual consent was also obtained from each of the purposively selected participants. The data was collected and strictly used for this study only.

The questionnaires were handed over to the hospital managers for distribution. The researcher also distributed some, and then collection dates were agreed upon among the researcher, the hospital managers, and the participants. The researcher and the participants reached a timeframe for interview agreement through their hospital managers. Together with the hospital managers and the participants, the researcher created an interview timetable for each of the selected hospitals. The participants were duly informed of the importance of the data and that it was strictly for study purposes.

5.12.1 Confidentiality

It is imperative to note that discretion should be reflected at each phase of a study procedure. Such steps include the research design, documentation, consent and permission processes of the population, analysis, publication and distribution of the outcome of a study (NHRPAC, 2002). The participants were assured that the data collected would remain confidential. As such, their names would not be mentioned in all the study documents, and all the information they provided would not be released to anyone at their hospitals, the WCPDHW, NDHSA, or any other individual or organisation (Okolo & Iruo, 2021). All the information and documents

were coded and stored in a safe and in computers to which only the researcher and the supervisors had access.

5.12.2 Anonymity

To secure anonymity, the participants were informed that their names would not be mentioned in the interview schedule and questionnaires (Gumede, Taylor & Kvalsvig, 2021). Also, the names of all the people contacted for the approval process of conducting the study in the WCPDHW of SA would not be mentioned. The anonymity and confidentiality of all the participants would be respected, and their details and information would remain anonymous (Clark, 2006; Nkala et al., 2021).

5.12.3 Informed consent

The hospital managers, HR, and IT managers were duly enlightened about the nature of the questions in the interview schedule and questionnaire; they were initially given the documents to preview before the data collection process began. Signed informed consent was obtained from the participants allowing the researcher to have face-to-face interviews, record the voice interviews using a voice recorder, and make notes during the interviews (Mayende & Musenze, 2018). The questionnaires were also completed with a signed consent letter from the individual participants.

5.12.4 Voluntary and privacy

The participants were informed that their participation in the study was voluntary, from which they had the right to withdraw at any given time, and if they intended to withdraw, their data would be removed from the study and destroyed (Khumalo, Segobe, Lutge & Mashamba-Thompson, 2021). They were also not obliged to answer any questions in the study that they were not comfortable with. The participants were also given their private space to feel free and comfortable when answering the questions without any disruption. The privacy and dignity of the participants were protected (Myers & Newman, 2007).

5.12.5 Debriefing

Debriefing is commonly used in a qualitative study whereby the participants would receive a response from the interview conducted to ensure that the transcribed information were the exact words used in the responses in the interview (Lavrakas, 2008). In this study, the hospital managers and the HR managers were given the option to receive follow-up information on the

data results, and contact details of the researcher, the supervisors and the research coordinator were provided in the introductory letter (Appendix C), for follow-up meetings concerning the data and outcome of the study (Etukudo, 2019). The NDHSA were also contacted on the progress of the study and was informed on how to access the final study.

5.12.6 No harm to the participants and the researcher

This study did not have any connection or dealings with issues relating to medical treatment, diagnosis, experiment or any harmful exposure to any medical procedures (Kum, 2018). Also, the study did not pose any harm to the participants, their colleagues, and the researcher.

5.13   DELINEATION OF THE STUDY

This study was limited to 4 public hospitals in the WCPDHW of SA, which include; 1 (MP Hospital) from the D/PAH category and 3 (RT, ER and DS Hospitals) from the C/CDH category (Department of Health (SA), 2021). The study is strictly on HRIS in the public health sector and the impact on health workforce management and sustainability. This study was only extended to select 87 staff members of the 4 selected public hospitals in Cape Town. No other hospitals (private or public), health facilities, organisations or companies were involved in this study. Also, no other persons were involved in this study except the 87 purposively selected participants from the 4 public hospitals mentioned previously.

5.14   LIMITATIONS OF THE STUDY

Initially, it was anticipated that there would be10 public hospitals participating. Considering that only 4 public hospitals participated, generalisation of the results should be done cautiously. Apart from the lack of generalisability of the findings, the emergence of COVID-19 in the middle of finalising the appointments for data collection in some hospitals affected participation.

Several participants who opted for interviews that should have generated deeper insights preferred to stay away, which reduced the number of participants. Perhaps better insightful results might have been achieved if all the participants had shown up. For instance, 60 interviews were proposed (15 for each hospital) involving the hospital managers, HR staff, IT staff, doctors, nurses, pharmacists, radiographers, and other skilled healthcare workers. Forty-one interviews were conducted entirely; the other participants withdrew due to the pressure on

the health sector caused by the rapid increase in the spread of the COVID-19 pandemic and other personal reasons.

Two hundred questionnaires were also proposed, fifty for each hospital and distributed through the hospital managers and by hand through the researcher. An agreement was reached regarding the time to complete and return questionnaires to the researcher. Follow-ups were also made by the researcher on the collection of the questionnaires. He was later informed that some of the participants lost or misplaced the questionnaires due to pressure at work. Subsequently, a new set of 30 questionnaires were again printed and handed over to some of the participants as replacements for the misplaced questionnaires. Unfortunately, the data collection process happened during the hard lockdown period due to the COVID-19 pandemic in the country and worldwide (Battersby, 2020). Only 46 completed questionnaires were returned to the researcher. The rest were never retrieved, even after several efforts by the researcher to recover the questionnaires.

5.14.1 Clarification of participants' roles and other important concepts

- **How and in what capacity would a nurse or those in clinical services, for instance, bother with HRIS?**
  In a study of this nature, it will be expected that the primary participants constitute those knowledgeable in IS. Nurses, doctors, and other clinical staff of the hospitals are likely to provide information on how the HRIS technology could impact their performance and the health sector in general.

- **What kinds of information will the nurses, doctors and or other clinical staff bring that justify inclusion in this study?**
  The nurses, doctors and other skilled health workers who participated in this study provided relevant information that assisted the researcher in gauging their knowledge of HRIS and how the system could impact their daily working activities.

- **What is HRIS all about?**
  HRIS is not only about computers and printers. It also refers to a computerised system comprising interrelated databases that track employees and their employment specific information.

5.15 CHAPTER SUMMARY

This chapter provided a synopsis of the research philosophy followed, from which the ontology and epistemology guiding the study were shown, and the research pattern highlighted. The research design was also laid out with a description of the approach, strategy and data collection method, a mixed method using qualitative and quantitative arrangements. In conclusion, the ethical issues were highlighted and followed accordingly. In summary, the ontological perception of the study was a point of subjectivism. This perception considers that

occurrences exist because of the social contract and actions based on the perceptions of humans. The study embraced a pragmatic paradigm based on the epistemological view that reality is based on subjective clarification of the observer. Therefore, the study falls within the paradigm arrangement of pragmatism (Willis, 2007), with the main purpose of finding out the reasons for the lack of effective HRIS in the public health sector. The study followed an abductive approach of inferring theories/models and using the outcomes to develop a framework for effective HRIS in the public health sector.

The study was designed based on a mixed method using a multiple case study and a survey as the research strategy, involving 4 selected public hospitals in the WCPDHW of SA as the unit of analysis. The observation unit purposively selected 87 participants from the selected public hospitals. The primary data were collected using both qualitative and quantitative methods. The quantitative method used an open-ended Likert scale questionnaire and was analysed using SPSS analysis software. The qualitative method of data was collected using a semi-structured close-ended interview schedule and analysed using ATLAS.ti. Both analyses were presented using a descriptive and exploratory research design and presentation to narrate the study's outcome.

The next chapter will discuss the data analysis and presentation of the study results.

CHAPTER SIX: DATA ANALYSIS AND PRESENTATION

Chapter six – DATA ANALYSIS AND PRESENTATION
Introduction
Biographical information of participants
The hospitals selected for this study
Data analysis
Chapter summary
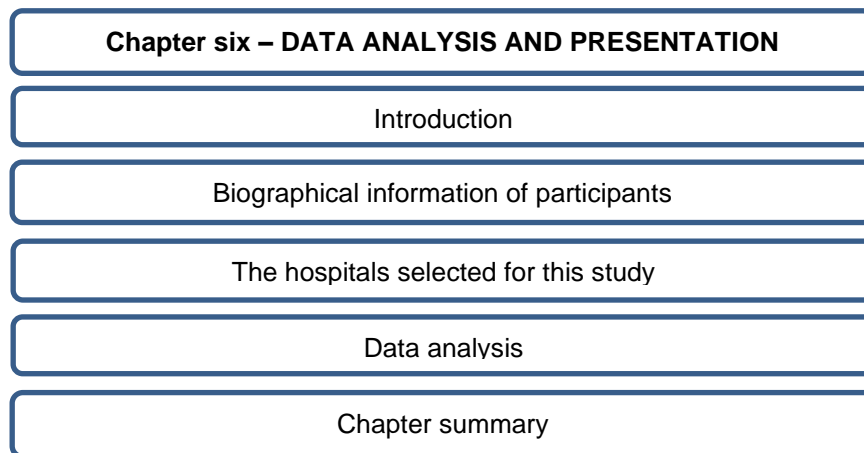
Figure 6.1: Layout of Chapter 6

6.1   INTRODUCTION

This study aimed to explore and understand the use of HRIS and the factors that prevent the effective use of such IS in the public health sector of the WC of SA. A further aim is a proposed guideline and a framework to guide the effective utilisation of HRIS in the public health sector for workforce retention and sustainability strategy in a complex healthcare environment.

The previous chapter explained, justified, and provided the rationale for the methodology adopted for this study. The present chapter analyses the data collected from the mixed method data collection process, which involved combining interviews and questionnaires from participants selected from four public hospitals in the WCPDHW. The interviews and questionnaires are presented in a narrative and descriptive style to attend to the research questions and sub-research questions. Categories, themes, and keywords emerged from the study through qualitative data analysis and a descriptive analysis of survey data.

The empirical data analysed in this study followed both qualitative and quantitative routes to allow for triangulation and analysis of complementarities of data following the work of Tashakkori and Teddlie (2003).

6.2   BIOGRAPHIC INFORMATION OF PARTICIPANTS

The study's methodology resulted in collecting two different data sets from two groups, namely a qualitative data set involving interviews and a quantitative data set based on questionnaires. The logic followed was based on the analysis of complementarities, convergence, and divergence of findings from the two data sets.

6.2.1   Age distribution of participants

The age group distributions of interviewees and questionnaire respondents are shown in Figure 6.2.
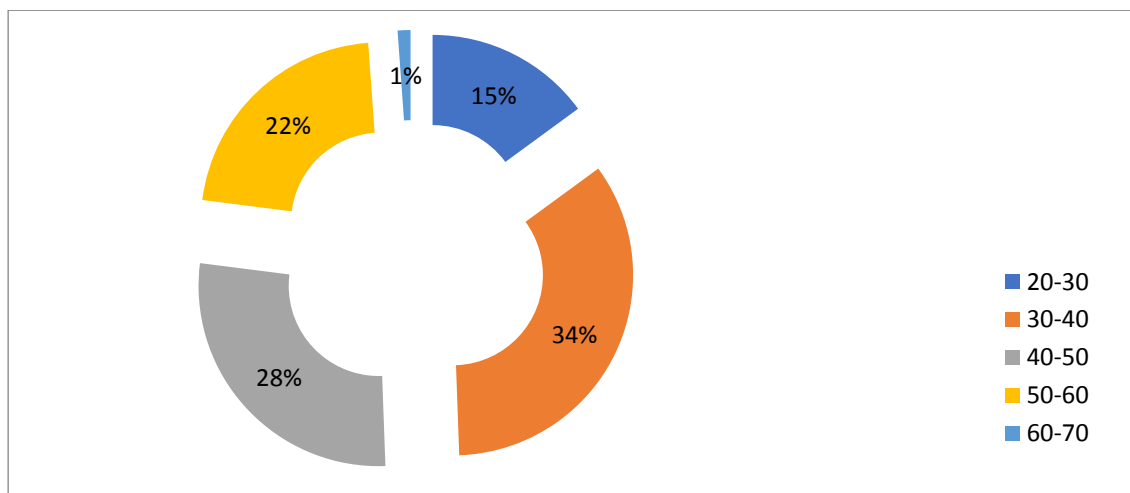
Figure 6.2: Age distribution of respondents

As seen in figure 6.2, the largest group (34.5%) of participants in both data sets were in the range of 30-40 years of age, followed by 40-50 years (28%), then 50-60 years (22%) and finally 20-30 years (15%). This shows that people between the ages of 30-40 years are more represented in the study, followed by 40-50 years, then 50-60 years and finally, people in the younger age between 20-30 years of age.

6.2.2   Qualifications of the participants

The qualifications of the participants are shown in Figure 6.3:
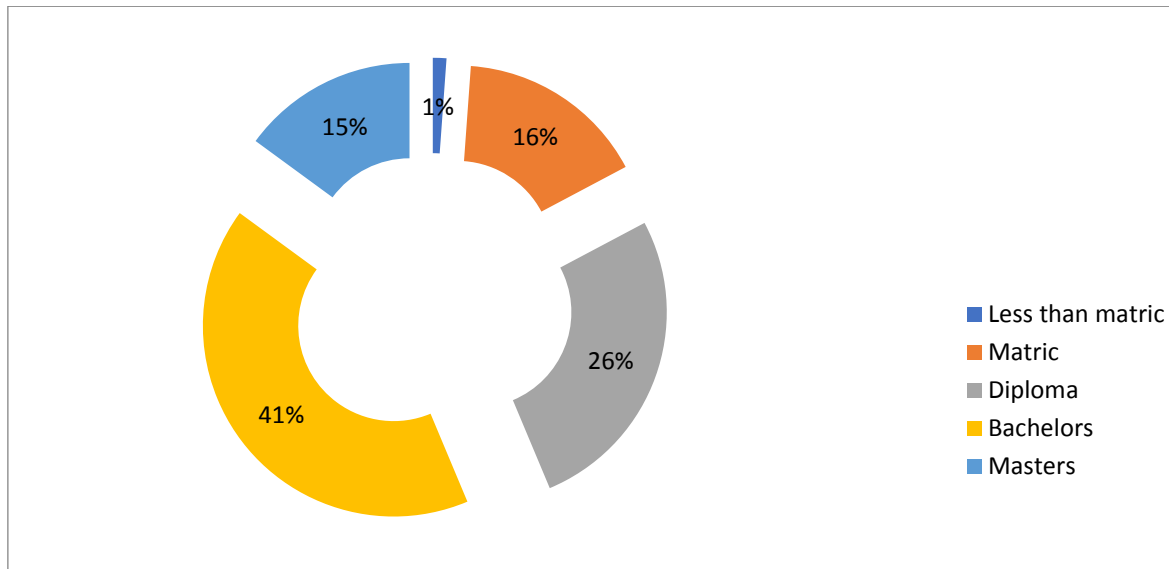
Figure 6.3: Qualifications of respondents

Figure 6.3 shows that in both data sets, the largest group (41%) of the participants were bachelor's degree holders, followed by diploma holders (26%), then matric holders (16%) and finally, master's degree holders (15%). This indicates that the study involved people who could provide relevant information to assist in analysing and presenting valuable data in the study.

6.2.3   Participants' years of service

Figure 6.4 depicts participants' years in service as public health workers.
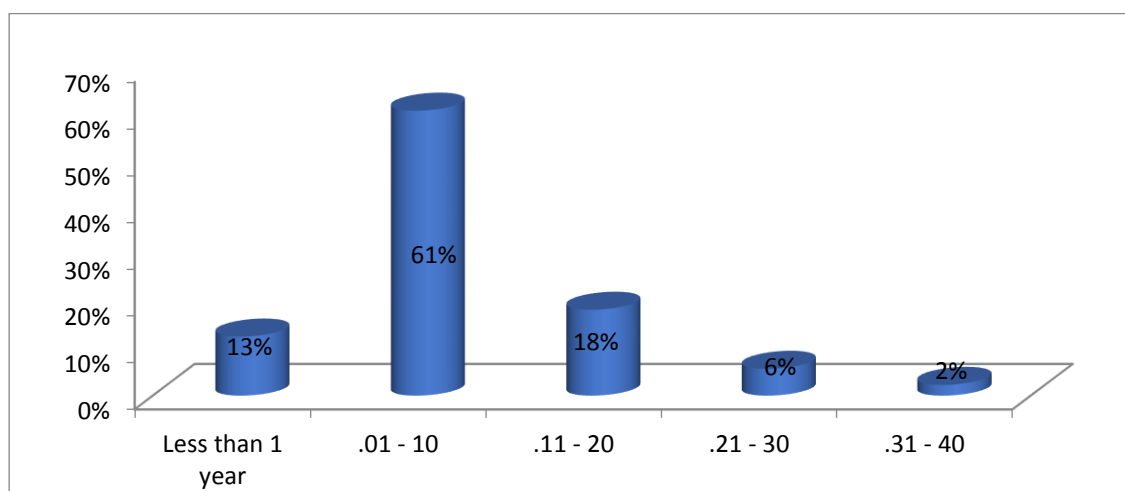
Figure 6.4: Respondents' years of service

Figure 6.4 indicate that the majority (61%) of the participants had worked between 1-10 years in their various hospitals, followed by 11-20 years (18%), then less than one year (13%). 6% of the respondents had 21-30 years of experience in the health sector, while only 2% had served for over 30 years in the health service.

6.2.4   Departments where the participants worked

Details on the departments where the participants worked are shown in Figure 6.5
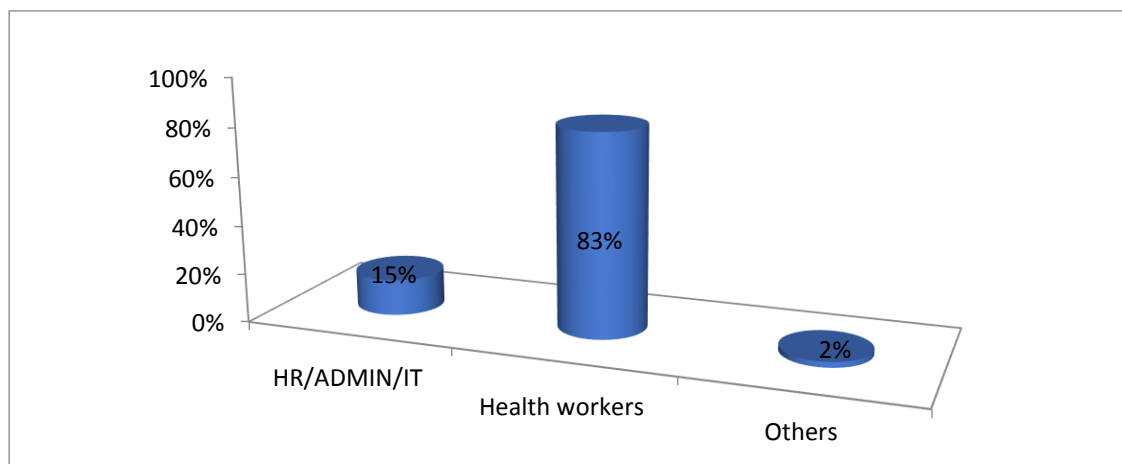
Figure 6.5: Areas of specialisation (departments of work) for the respondents

Figure 6.5 show that the majority (83%) of the participants in both data sets were healthcare workers, followed by the HR/IT/Admin staff in the range of (15%) and others in the range of (2%). This is an indication that the study involved a considerable pool of healthcare workers in various departments such as human resources (HR), information technology (IT) administration (Admin), and clinical/skilled health staff members, a range of occupations that would enable a clear understanding of the effectiveness of HRIS in the health sector.

6.2.5   Participants' designation at work

Work designations of the participants can be seen in Figure 6.6
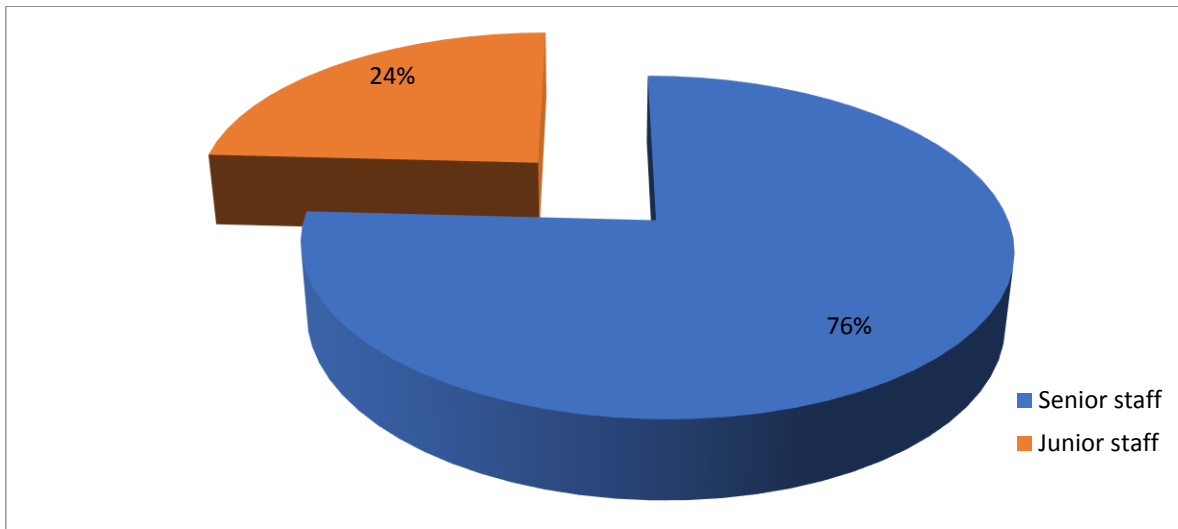
Figure 6.6: Designation of respondents

Figure 6.6 show that the majority (76%) of the participants in both methods were senior staff of the hospitals, while the junior staffs were 24% of the participants. This indicates that the study was of interest to the senior staff members who had experience with what was happening in the hospitals.

6.2.6   Gender distribution of the participants

The gender distribution of participants is shown in Figure 6.7
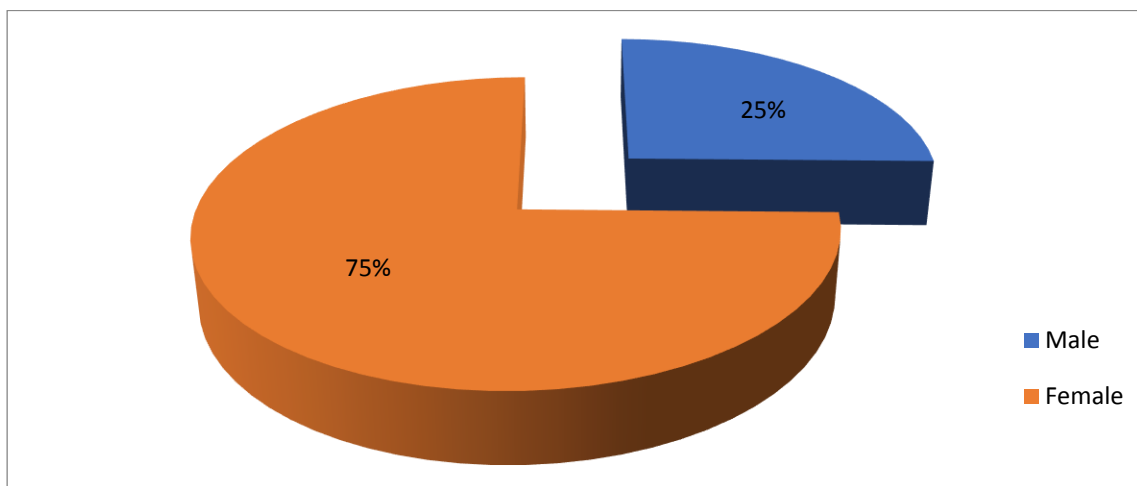
Figure 6.7: Gender distribution of respondents

Figure 6.7 show that 75% of the participants in both method groups were females. In comparison, 25% of the participants were males, which indicated that most of the health

workers who participated in the study were females. This might have something to do with the number of nurses that participated in the study.

6.3   THE HOSPITALS SELECTED FOR THIS STUDY

6.3.1   Information on hospitals that participated with their codes

Table 6.1 shows the total number of hospitals that participated in the study with the codes used to identify them, including the number of participants from each selected hospital.

Table 6.1: Total number of participants in this study

S/N	Identified codes of the hospitals	Frequency	Percentage	Valid percentage	Cumulative percentage
1	MP Hospital	24	27.6	27.6	**27.6**
2	RT Hospital	24	27.6	27.6	**55.2**
3	ER Hospital	23	26.4	26.4	**81.5**
4	DS Hospital	16	18.4	18.4	**100.0**
	TOTAL	**87**	**100**	**100**	

Table 6.1 showed that MP and RT hospitals had 27.6% participants, 26.4% from ER and 18.4% from DS hospitals. This indicates that MP, RT, and ER hospitals had the highest number of participants in this study, followed by DS hospital.

6.3.2   General information of interviewed participants with their codes

Table 6.2 indicates the selected hospitals and the number of participants interviewed from each hospital. Table 6.2 also shows the interview codes used to refer to participants from each selected hospital.

Table 6.2: General information of participants interviewed in codes

S/N	Codes of the hospitals	Participants interviewed in codes	Frequency	Percentage	Valid percentage	Cumulative percentage
1	MP Hospital	MI01 – MI09	9	22.0	22.0	**22.0**
2	RT Hospital	RI01 – RI15	15	36.6	36.6	**58.5**
3	ER Hospital	EI01 – EI13	13	31.7	31.7	**90.2**
4	DS Hospital	DI01 – DI04	4	9.8	9.8	**100.0**
	TOTAL		**41**	**100**	**100**	

As Table 6.2 shows, 36.6% of the participants interviewed were from the RT Hospital, followed by 31.7% from the ER Hospital; 22% of the participants were from MP hospital, and lastly, ten per cent (9.8%) were from DS Hospital. The MP, RT and ER Hospitals are in the Cape Flats, which is commonly labelled as a gang-ridden, high crime environment in the Western Cape. This shows that most of the people interviewed worked in the hospitals situated in Cape Flats (economically stressed area). Still, all the selected hospitals are in the WC of SA.

6.4   DATA ANALYSIS

The analysis presented in this section was done in specific consideration of the research questions and objectives as set out in chapter one. The literature review in chapters (2 - 4) provided the theoretical dimension of each research question and objective, making it necessary to interpret the findings within the relevant literature in the next chapter 7. As such, the findings of this study are a culmination of theoretical and empirical inquiry. The empirical investigation comprises two data sets collected through interviews and questionnaires. Sections (6.4.1 - 6.4.3) provide the analysis in a question-by-question approach. Each analysis is composed of qualitative, quantitative, and theoretical dimensions. Qualitative data analysis methods, including thematic reduction, iterative progress, and comparative analysis, were employed, and descriptive data analysis of the quantitative data was employed for a complementary analysis. In performing the analysis, none of the methods used was superior to the others. The final objective was to identify data convergences, complementarities, and divergences to interpret a final position concerning the research questions developed for this study.

The qualitative and quantitative findings (clearly highlighted) for each research objective are presented below.

6.4.1   Factors that hinder the effective utilisation of HRIS in the public health sector

(RQ1: – What factors hinder the effective utilisation of HRIS within the health sector of South Africa?)

The first research question was framed as: *What factors hinder the health sector from not effectively utilising HRIS*? Two sub-questions were formulated to address this question: i) what are the reasons for the ineffective utilisation of HRIS in the health sector? And ii) how does HRIS impact the performance of the health sector? Responses to the sub-research questions

assisted to generate information that allowed the study to provide factors for the ineffective utilisation of HRIS in the health sector. The analysis and summary of the sub-research questions combine both qualitative and quantitative data. As provided in chapter one, HRIS enriches the HR function in many ways. Despite these sentiments, the responses suggest that HRIS has not been effectively implemented and utilised with no proper monitoring and control measures in the health sector, resulting in a drastic reduction of the skilled health workforce (Were et al., 2019). This study was then formulated to address specific research questions, and data was collected, as highlighted in the previous chapter. This section analyses the data collected in response to the research questions.

6.4.1.1 Reasons for the ineffective use of HRIS in public health sector

(SRQ1.1: What are the reasons for the ineffective utilisation of HRIS in the health sector?)

In assessing the HRIS usage in the health sector, the researcher posed questions to identify the reasons for the ineffective utilisation of HRIS to realise its effectiveness in the sector. This section analyses data collected in response to the research questions.

6.4.1.1.1 Quantitative analysis of responses on reasons for the ineffective use of HRIS in public health sector

Figure 6.8 presents the results from the questionnaire on the reasons for the ineffective use of HRIS in the health sector. Ideally, Figure 6.8 shows that there was notable agreement (55% of respondents) that there are several reasons for the low utilisation of HRIS in the health sector. Many of them were outside the scope of the present study. Qualitative analysis that was done earlier indicated that respondents were not aware of how HRIS can aid the functionality of HRD. In Figure 6.8, it shows that the number of respondents (27%) who felt that HRIS does not influence HR functionality was higher than that of those who believed that HRIS does improve HR functions. 28% of the participants gave a negative response to whether the HRIS enables the HR department to perform new and enhanced roles. 45% also disagreed that the size of the hospital determines the effectiveness of HRIS, and 48% mentioned that they do not have a separate HRD and do not make use of HRIS. 37% disagreed that the HRIS effectively stores and retrieves information, but due to frequent payroll errors, they have doubts about storage and retrieval. 44% agreed they have security in HRIS because the system has never been hacked. 41.3% also agreed that they have internet access, but they do not have the infrastructure to access the internet. 50% agreed that the HRIS could link to the provincial and national governments, but only the permanent workers are captured. 52% agreed that they have an idea that the public health sector uses PERSAL but lack the knowledge of PERSAL

as HRIS. 37% agreed that the public health sector uses the PERSAL system, but the problem is that the HR functions are not fully automated.
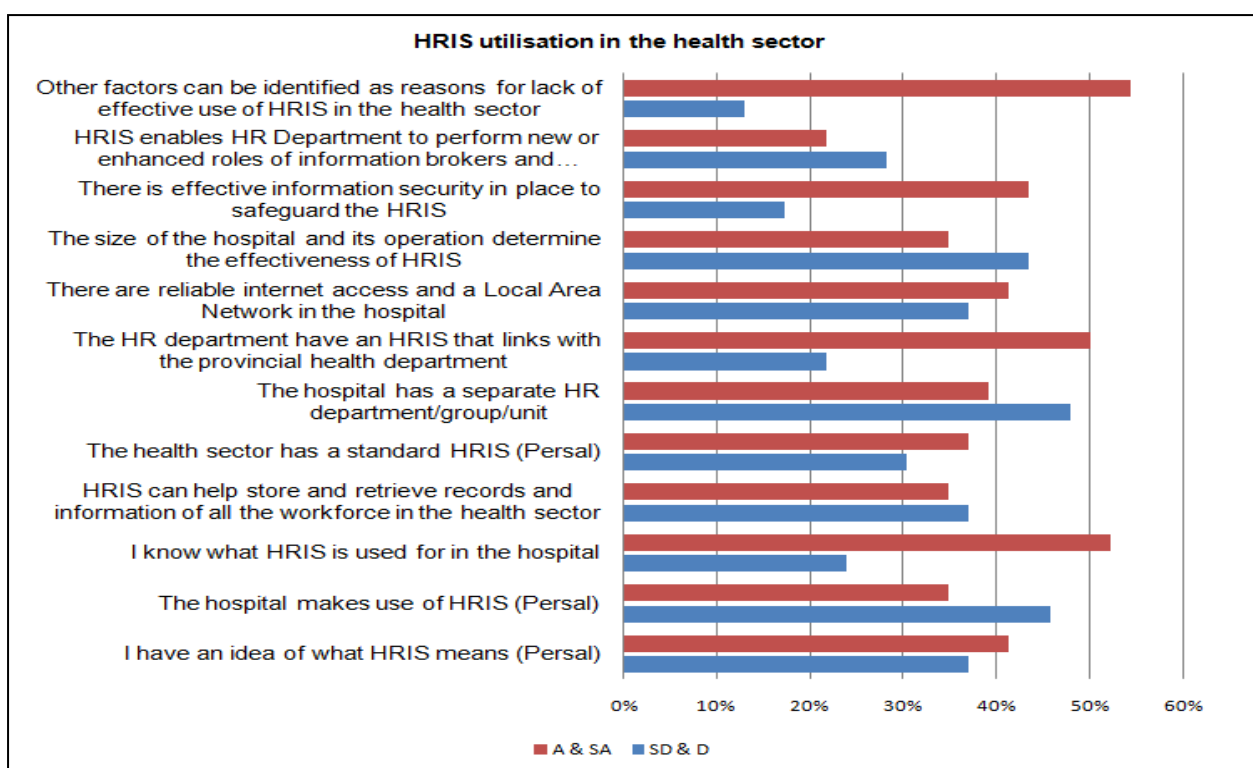
Figure 6.8: Quantitative analysis of reasons for the ineffective use of HRIS

Thus, the lack of awareness of the value of HRIS (derived from qualitative analysis) is linked to the low number of respondents who consider HRIS as necessary for HR functionality. This suggests that if they are unaware of the existence of a system, they are equally unable to assess its usefulness to the functions of the HRD.

Quantitative data collected in this study also supported what was found in the interviews that HRIS in the health sector is mainly associated with PERSAL.

6.4.1.1.2 *Qualitative analysis of responses on reasons for ineffective use of HRIS in the public health sector*

The structured interview guide from which data on the reasons for ineffective use of HRIS was probed used eight domains that affect HRIS as informed by the literature. These domains were: HRIS knowledge across organisational levels, awareness of HRIS use, HR unit at the hospital level, the number of people using HRIS, hospital size, information security,

enhancement of HR functionality through HRIS, and other reasons for ineffective HRIS. These domains became specific items of the interview guide. Codes were collected for the question items linked to sub-research question 1.1. Both in vivo codes and new codes were used to code the responses provided. Each code was categorized appropriately in line with the questions. Figure 6.9 provides the coding sheet and the percentage frequency of the codes to demonstrate their strength and how it was supported

	Count	% Codes	Cases	% Cases
HRIS knowledge across organisational levels				
• Lack of HRIS knowledge	17	5.3%	14	34.1%
• HRIS not used	1	0.3%	1	2.4%
• Possession of HRIS knowledge	29	9.0%	26	63.4%
Awareness of HRIS use				
• Inadequate awareness of HRIS	20	6.2%	17	41.5%
• Aware of use of Persal, PAMIS	24	7.5%	17	41.5%
• Not aware of HRIS use	20	6.2%	15	36.6%
• Yes HRIS is used. ESS for leave	6	1.9%	4	9.8%
Existence of an HR unit at hospital level				
• New employees not sure	1	0.3%	1	2.4%
• Does not exist	14	4.4%	14	34.1%
• Yes. Just an officer	3	0.9%	3	7.3%
• Not well informed	7	2.2%	5	12.2%
• Yes	24	7.5%	19	46.3%
Number of people using HRIS use				
• Not sure	3	0.9%	3	7.3%
Hospital size and effectiveness of HRIS use				
• Large staff complement lead to minimum personal interaction	29	9.0%	28	68.3%
• I dont think so	4	1.2%	4	9.8%
• I dont know	7	2.2%	7	17.1%
Information security and HRIS				
• Yes. password	13	4.0%	12	29.3%
• Not aware	13	4.0%	12	29.3%
• No security	4	1.2%	4	9.8%
• Thinks there is security	10	3.1%	9	22.0%
• Thinks it does	4	1.2%	4	9.8%
Ehancement of HR functionality through HRIS				
• Disagrees	3	0.9%	3	7.3%
• Does not know	18	5.6%	18	43.9%
• Agree	15	4.7%	15	36.6%
Reason for ineffective use of HRIS				
• Unwillingto change from traditional paper based HRM	12	3.7%	12	29.3%
• Absence of a distinct HR Unit	5	1.6%	5	12.2%
• No HRIS training	10	3.1%	9	22.0%
• Lack of funds	1	0.3%	1	2.4%
• None that I know	4	1.2%	4	9.8%

Figure 6.9: Qualitative response on the reasons for ineffective use of HRIS in the health sector (in categories and codes)

A code occurrence frequency distribution for the qualitative analysis was also generated as depicted in Figure 6.10. The code frequency graph simply illustrates the occurrence of each code. This provides an idea of how respondents resonated with it.
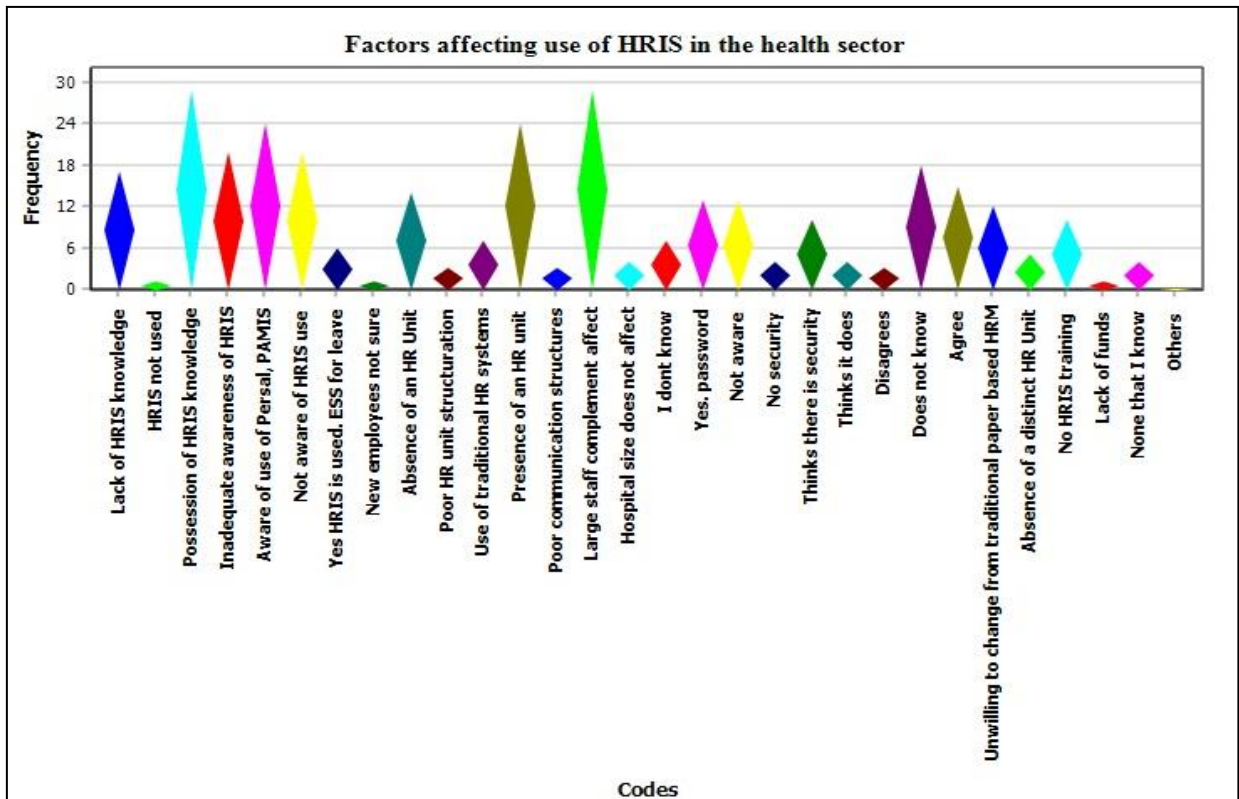
Figure 6.10: Code occurrence frequency for the qualitative data analysis of ineffective use of HRIS in public health

The codes shown in Figure 6.10 emanate from Figure 6.9. Figure 6.9 is vital because it classifies the codes and groups, thereby allowing the interpretation of the codes within context. Therefore, the explanation following relies mainly on the categories and groups as shown in Figure 6.9.

6.4.1.1.2.1 HRIS knowledge across organisational levels in public health

The category - *HRIS knowledge across the health institutions* was created to capture issues related to HRIS knowledge among the interviewees. In Figure 6.9, the codes created within this category were (1) Lack of HRIS knowledge, (2) HRIS not used at all and (3) possession of HRIS knowledge. Within this category, the code 'possession of HRIS knowledge' showed a frequency of 63, 4% higher than other codes. This showed that the respondents felt that they possessed some knowledge of what HRIS is and what it is used for. The following respondents, EI01, EI06, EI07, EI08, EI09, EI10, EI11, EI12, MI01, MI07, MI08, MI09, RI03, RI07, RI08, RI09, RI12, RI13 and RI14 indicated that they had an idea of what PERSAL system meant (Appendix N of transcription). Respondent RI04 stated that "the PERSAL system is a data centre for the health workforce in SA". This shows that some of the

respondents felt that they possessed some knowledge of HRIS but were unsure how it worked.

6.4.1.1.2.2 Awareness of HRIS usage in public health

The results demonstrate that despite the awareness that the health institutions mainly used the PERSAL system; the respondents felt that their awareness was inadequate. The category *Awareness of HRIS* was dominated by the indication from the respondents that there is inadequate awareness of HRIS within the health institutions (41.5% cases) as well as awareness of the use of PERSAL for HRM. Figure 6.9 shows that most of the codes (41.5%) either suggest a lack of awareness of the use of HRIS in the institutions or an awareness of the use of PERSAL. As such, the data indicated some awareness of the use of PERSAL in Health institutions. Respondent RI04 stated that the hospital manager and some of the managers do the HR things manually and report to the substructure hospital. Respondent EI13 also indicated that "there is someone who does their HR functions manually and sends the documents to the substructure hospital's HRD to capture on the system.

The comment from respondents RI07 and RI13 are also similar to that of respondent EI13, in that they deal with one person in their hospital who sends their HR documents to the substructure.

A large number of respondents indicated a lack of awareness of the use of HRIS in their health institution because most hospitals conduct HR functions manually and submit documents to the substructure which is another hospital to capture on a system (HRIS).

6.4.1.1.2.3 Existence of an HR unit at the hospital level in public health

This was an important category that sought to establish the degree to which there was notable structuration within the HR function. The study was aligned with the view that effective use of HRIS in health institutions would call for proper structuration of the HR department (HRD). In Figure 6.9, the results of the interviews suggested that each hospital seemed to have an HR unit, as shown by a 46% code occurrence of the existence of an HR unit at the hospital level. Respondents DI02 and DI03 believed that they do have an HR person that does the HR work manually, but they do not have a fully-fledged HRD. However, Cape Metro is divided into 4 substructures according to the big geographical area; each one has an HR and Finance department which all the facilities/clinics in that area fall under the substructure. Respondents RI02, RI04, and RI13 also indicated that RT hospital does not have HRD, they fall under a substructure that does all their HR work, but they expect the hospital manager and other

managers under her to do all the HR work in the facility manually and send documents to the substructure for capturing on the system.

This indicates that most hospitals do not have a fully-fledged HRD but do have an HR person (unit) that does the HR functions manually and sends the documents to the substructure to capture in the PERSAL system.

6.4.1.1.2.4 Information security and HRIS in public hospitals

In Figure 6.9, most codes (29.3% frequency) held that there was a security of data in the use of HRIS owing to the use of passwords to protect data access; also, 22% thought there was a security of data. However, a similar percentage of 29.3% was unaware of how data was secured in HRIS. For instance, respondent MI03 stated that:

> They do have information security to safeguard the HRIS because the PERSAL system has a secure login pin, for screen1 to have access and screen2 to allow the functions they need to work on.

Respondent MI01 also mentioned that:

> They have never heard of any hacking. There are lines of approvals and authorisations that must be followed before any information is captured on PERSAL.

Respondents EI08 and EI09 also mentioned that "in ER hospital, the HR system is manual, and documents are filled in a locked cabinet where only the hospital manager and the HR person can have access to them".

However, respondents EI11 and RI09 both had an unfavourable opinion in mentioning that there are situations where anyone can walk into the administrative office in their hospitals and pull-out people's files from the cabinet. "There is no security of documents in the manual filling system".

This shows that while there is a security of data in using HRIS using passwords and login pins, hospitals without HRD conduct HR functions manually and file the documents in a cabinet where people can easily walk in and access the records from the cabinet, which signifies a lack of data security in the manual system used in most hospitals.

6.4.1.1.2.5 Enhancement of HR functionality through HRIS in public health

The general assumption held throughout the study was that HRIS is likely to enhance HR functions, and it was essential to establish if the respondents felt the same way. In Figure 6.9,

the qualitative data collected suggested that the largest group (46.9%) were unaware of HRIS enhancing HR functions. Despite the above, thirty-six per cent (36%) of respondents also felt that HRIS is likely to improve the effective functionality of the HR function.

6.4.1.1.2.6 Hospital sizes and the effectiveness of HRIS usage in public health

There was a more significant indication in Figure 6.9 from the respondents (68.3% case occurrence) that the size of the hospital is likely to influence the effectiveness of HRIS usage. Seventeen per cent (17%) of the code cases felt they did not know their position concerning the impact of hospital size on the effectiveness of HRIS usage. Thus, some respondents suggested that hospitals with more staff complements could face workforce coordination challenges if they do not make use of effective HRIS irrespective of the hospital size.

According to respondents EI04, DI03, EI11, and RI03, size matters in using an HRIS because ER and RT hospitals are 24-hour day hospitals, and their systems are not as sophisticated as those of the substructures, tertiary, specialist, and other big hospitals. Respondents RI04, RI06, DI04 and EI08 also support respondents EI04 et al. by indicating that the problem they have is that the infrastructures available do not allow them to have an effective HRIS in place, which makes the HR submissions manually and complicated.

The findings indicate that the lack of effective HRIS in hospitals could lead to a lack of workforce management in hospitals with more staff complements irrespective of the size of the hospitals.

6.4.1.1.3   Summary of ineffective use of HRIS in the public health sector

As popularized by known grounded researchers Glaser and Strauss (2017), qualitative researchers use theoretical sensitivity and constant comparison to reduce their data and iteratively derive relevant information that responds to their study questions. Kolb (2014) suggests that qualitative researchers involve a series of data reduction processes mainly focused on theoretical sampling. A summary of the reasons for the poor utilization of HRIS derived from this study is provided in Figure 6.11.
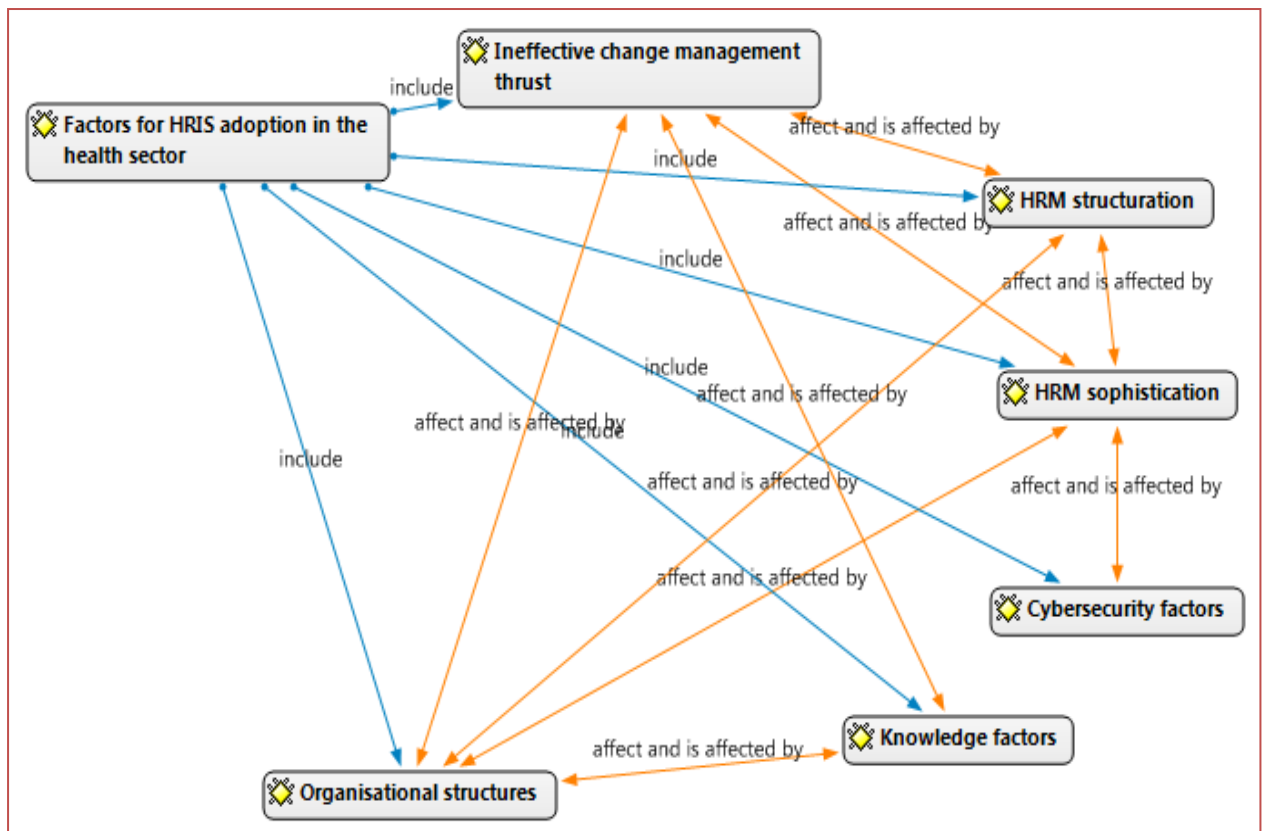
Figure 6.11: Summary of ineffective use of HRIS in the public health sector

The results related to sub-research question 1.1 suggest that poor HRIS utilisation in the health sector can be attributed to inadequacies of the structure of HRM systems, knowledge factors, HRIS sophistication, cybersecurity factors and ineffective change management thrust within the health sector.

6.4.1.2 Impact of HRIS on the performance of skilled workers in public health sector

(SRQ1.2: How does HRIS impact the performance of the health sector?)

Sub-research question 1.2 was formulated to examine research question 1, which was stated in chapter one: What factors hinder the effective utilisation of HRIS within the health sector? The perceived impact of HRIS in relation to the performance of the health sector was considered to link with the factors for the ineffective utilisation of HRIS. The logic was that if the perceived impact is negative, then this may translate to ineffective HRIS use, while if the perceived impact is positive, then this may translate to increased desire to use HRIS. The final assessment regarding the present sub-research question was to classify the arising perceptions of HRIS impact in terms of positivity or negativity. The initial analysis preferred for this sub-research question was in the quantitative study to get an overall impression of the

responses provided and then follow up the results, considering the qualitative responses as these would provide more in-depth explanations on emerging trends in the responses.
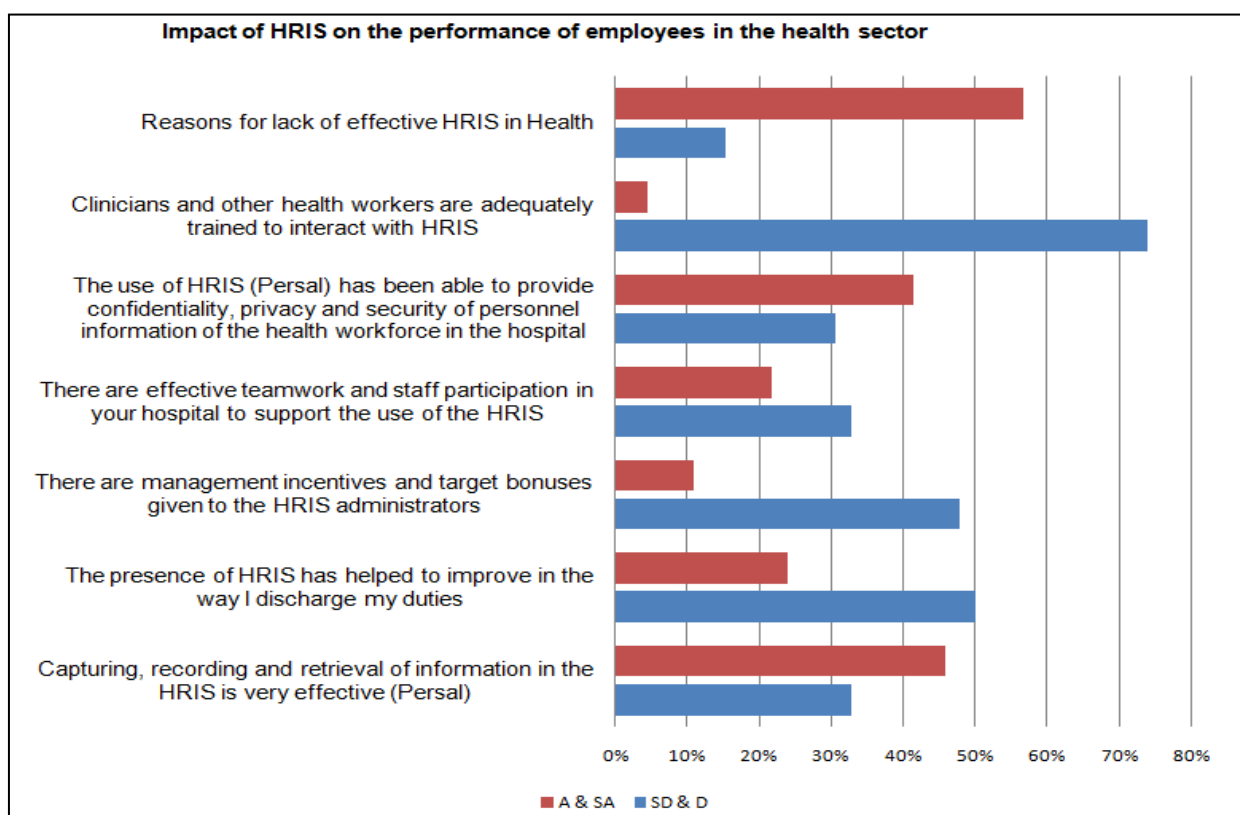
Figure 6.12: Quantitative responses on the impact of HRIS on the performance of health workers

6.4.1.2.1 Quantitative analysis of the impact of HRIS on the performance of healthcare workers in the public health sector

The responses provided on the questionnaire items linked to the sub-research question on the impact of HRIS on the performance of the health sector are provided in Figure 6.12. Significant differences in the agreement, as opposed to disagreement responses, were observed on the question of training (dominated by disagreement responses), management incentives for HRIS use (overwhelmed by disagreement responses), and the assertion that HRIS enhances the discharge of duties was also dominated by disagreement. This showed a stronger perception that HRIS had not enhanced work discharge (50%) than perceptions that HRIS has improved work discharge (23%) and the other percentage represented neutral ones. Higher agreement responses (42%), as opposed to agreeing on responses (30%), were observable in the assertion that HRIS has improved information security and confidentiality. A better percentage of respondents (46%) agreed that HRIS had improved information capturing, recording and retrieval. 48% of the participants gave a negative response to management incentives to HRIS

194

users. 33% disagreed with the existence of teamwork in the use of HRIS, and collaboration among the HRIS users. Also, 74% did not agree that they used HRIS to train clinicians in their work functions. However, 41% agreed that the HRIS did provide confidentiality of workers' information. Still, the lack of upgrades and other reasons, as indicated by 56.5% of the participants, was why the health sector was not achieving its objective of using HRIS.

The concluding remark that seems to arise from these observations is that despite respondents suggesting that HRIS has improved information security, confidentiality as well as the capturing, recording and retrieval of data, there were notable observations that HRIS had not helped improve work performance. There had also not been adequate training through the HR function, although, many hospitals do train healthcare workers by other means. It also seemed that there was an indifferent approach to adopting HRIS as respondents generally disagreed that there had been any incentives to propel HRIS adoption in the health sector.

6.4.1.2.2 Qualitative analysis of the impact of HRIS on the performance of health workers in the public health sector

Quantitative analysis conducted earlier suggests that respondents felt that HRIS had improved the confidentiality, security, capturing, recording and retrieval of HR data. However, they disagreed that HRIS had improved the way they worked. Qualitative data collected regarding the impact of HRIS in the health sector was therefore clustered along the dimensions shown in Figure 6.13. There was also a significant observation that there were no incentives, including training that was being implemented for HRIS use. These observations helped guide the nature of the qualitative analysis done in the following section.

In assessing how HRIS can impact the performance of the health sector, questions aimed at ascertaining the confidentiality, commitment, and relation to the performance of the health workforce formed the basis of the interviews. Codes and categories were collected for the question items linked to sub-research question 1.2. Both in vivo codes and new codes were used to code the responses provided. Each code was categorised appropriately to be in line with the questions. Figure 6.13 provides the coding sheet and the percentage frequency of the code to demonstrate its strength and how it was supported. A qualitative coding frequency output was considered essential to analyse the strength of data clusters and codes in terms of frequencies. Figure 6.14 shows a code occurrence frequency output from the qualitative data.

	Count	% Codes	Cases	% Cases	Nb Words	% Words
Capturing, recording and retrieval of information in HRIS						
● Effective capturing and recording	21	8.8%	21	51.2%	304	0.3%
● Use of computers not comfortable	2	0.8%	2	4.9%	26	0.0%
● Poor computer skills leading to ineffective capturing and recording of data	6	2.5%	6	14.6%	156	0.2%
● Ineffective capturing and recording	6	2.5%	6	14.6%	140	0.2%
● Lacks knowledge of capturing , recording and retrieval of data using HRIS	8	3.3%	8	19.5%	153	0.2%
Improving performance						
● Ineffective - errors and mistakes delay performance	8	3.3%	8	19.5%	141	0.2%
● Effective in improving performance than paper	19	7.9%	19	46.3%	317	0.4%
● Indifferent	12	5.0%	12	29.3%	143	0.2%
Incentives for HRIS use						
● No knowledge of HRIS use incentives	36	15.1%	35	85.4%	176	0.2%
● Beliefs there is some HRIS use incentives	5	2.1%	5	12.2%	78	0.1%
Team work and staff participation in HRIS use						
● No effective team work and staff participation in HRIS use	10	4.2%	10	24.4%	99	0.1%
● There is a team to facilitate HRIS	12	5.0%	12	29.3%	90	0.1%
● Not aware of any team	16	6.7%	16	39.0%	127	0.1%
Confidentiality and security in HRIS use						
● Passwords ensure security	5	2.1%	5	12.2%	30	0.0%
● It seems there is security	29	12.1%	29	70.7%	202	0.2%
● There is no security	6	2.5%	6	14.6%	159	0.2%
Reasonse depriving HRIS use in the Health sector						
● Negative attitudes towards computer use	18	7.5%	17	41.5%	283	0.3%
● Ineffective training	6	2.5%	6	14.6%	81	0.1%
● Poor HRIS structuration	9	3.8%	9	22.0%	241	0.3%
● Auditing its effectiveness	1	0.4%	1	2.4%	40	0.0%
● Government is not committed to HRIS use	2	0.8%	2	4.9%	60	0.1%
● Data insecurities	2	0.8%	2	4.9%	68	0.1%

Figure 6.13: Qualitative data response on the impact of HRIS on the performance of employees with code frequency chart output

Quantitative data analysis was reported in Figure 6.12 and pointed out that the respondents felt that HRIS has improved data capturing, processing, and retrieval. The qualitative data in Figure 6.13 also supported these findings. A high code frequency (51%) was observed. In this case, qualitative data concurred with the quantitative data. As pointed out from the quantitative data analysis, the absence of training was also reflected in the codes. About nineteen per cent (19%) of the coded responses indicated a lack of adequate knowledge of the effective use of HRIS. This problem suggests inadequate training of HRIS, as inferred from the analysis of quantitative data. Considering performance improvement, forty-six per cent (46%) of the codes indicated that respondents perceived that the use of HRIS improved their performance. This seemed to have varied with the analysis of qualitative data. This discrepancy could have

arisen due to the interview item's relative nature related to HRIS and paper-based systems. Respondents felt HRIS was better than paper-based work. Further considering the coding frequencies of the qualitative data generated, the codes frequency graph is provided in Figure 6.14.
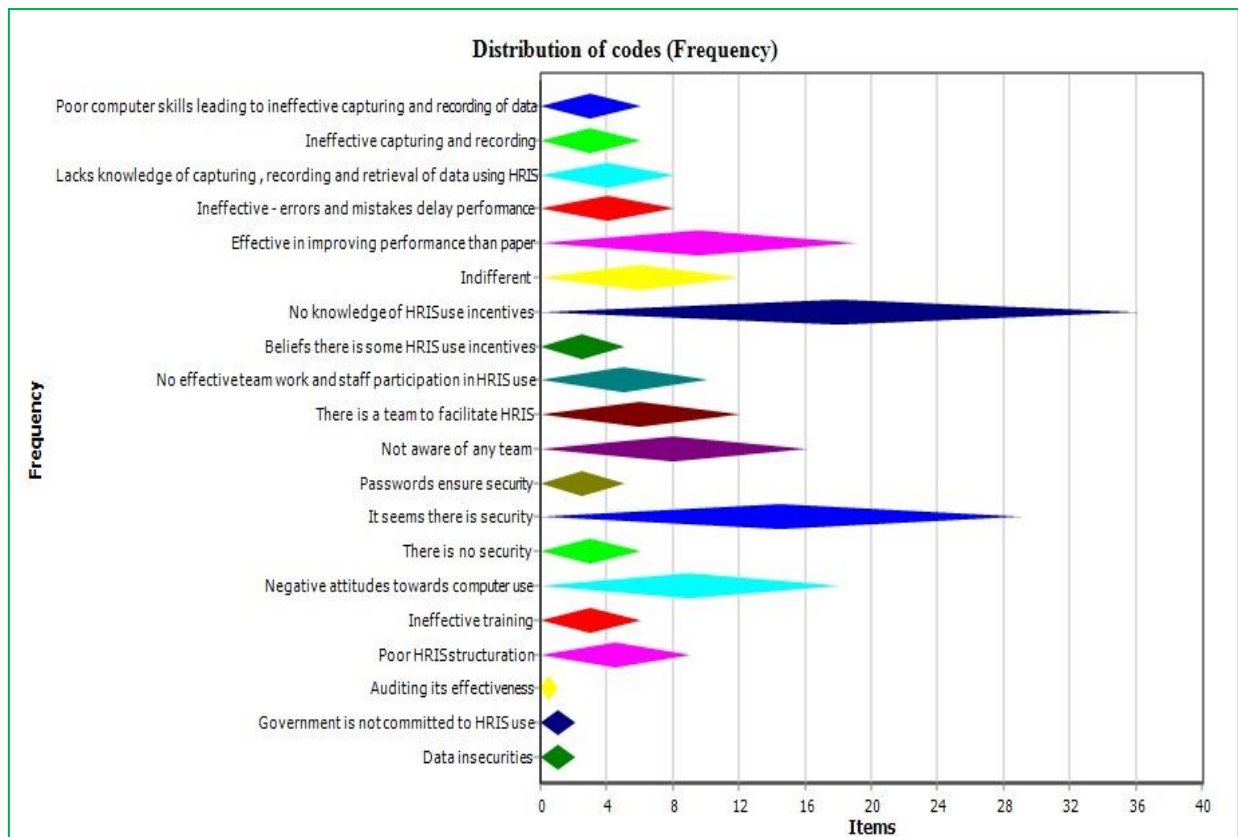
Figure 6.14: Code distribution frequencies for the impact of HRIS on the performance of employees

From Figure 6.14, it appears that there were also notable negative attitudes towards computer use observed from the responses analysed from the qualitative study. The codes shown in Figure 6.14 emanate from Figure 6.13. Figure 6.13 is important because it classifies the codes and groups, thereby allowing the interpretation of the codes within context. Therefore, the discussion following relies mainly on the categories and groups as shown in Figures 6.13 and 6.14.

6.4.1.2.2.1 Capture, retrieval, and record information in HRIS in public health

The category - *Capturing, recording, and retrieving information in HRIS in the health sector* was created to capture information on the effectiveness of the information stored in the

system. In Figure 6.13, the codes were: i) 4.9% use of computers not comfortable, ii) 14.6% poor computer skills, iii) 14.6 ineffective capturing and recording, and iv) 19.5% lack of knowledge of capturing and recording of information in HRIS. Within the category, the code effective capturing and recording showed that 51.2% of the respondents were more than the other codes. The indication is that majority of the respondents agreed that capturing and recording in HRIS is effective. According to respondents DI01 and RI11, PERSAL was quite effective, but most workers were not comfortable using computers, so sharing information was difficult.

Respondent EI03 also indicated that:

> Capturing information in HRIS might be effective because we send information/documents to the substructure to capture.

Respondents MI03, DI04 and EI09 also mentioned that the effectiveness is capturing information where people must be trained to use the system.

Respondent MI06 also believed that "it is effective, but just the workload is the issue".

Respondent MI04'a comments support respondent MI06 that "capturing and recording might not be a problem, but when there are too many people in the system at a time can slow the network and other processes, which is a major problem".

This indicates that capturing and recording could be effective. Still, information retrieval could be a problem because not all the facilities had access to the HRIS and not all workers had access to the HRIS. Also, some workers were not comfortable with the system due to poor computer skills and network overload affecting the availability of information from the system.

6.4.1.2.2.2 Improving performance through HRIS in public health

The theme of performance improvement was created to capture the impact of HRIS in the advancement of performance in the health sector. In Figure 6.13, the codes created within the category were: i) 19.5% ineffectiveness caused by errors and mistakes, ii) 29.3% indifference between manual and information systems. Within this category, the code effectiveness of HRIS in improving performance over the manual system was evident (46.3%) more than the other codes. Respondent EI13 indicated that "ineffective HRIS does affect their performance because sometimes there is a new appointment to commence work and HR documents get missing which ultimately affect their performance at work".

Respondent EI12 supports respondent EI13 by mentioning that "they do not have PERSAL in their hospital and do not have access to HRIS, which makes their system manually and

ineffective". Also, respondents DI04 and RI11 indicated that the lack of effective HRIS has negatively affected their work because they had to leave their work and travel to another hospital (substructure) to solve their HR problems. Respondents DI02 and EI08 support respondents DI04 and RI11 by pointing out that it is frustrating how they submitted HR documents manually and sometimes they got lost in transit to the substructure or were not received and captured at the right time.

This indicates that within public hospitals, HR functions are manually conducted, and documents could go missing in transit to the substructures, which signifies the lack of effective use of HRIS in the health sector. It also negatively impacted the workers' performance because they had to spend their working time visiting the substructure to resolve HR-related issues.

6.4.1.2.2.3 Incentives for HRIS usage in public health

The category - *Incentives for HRIS use in the health sector* was created to capture the knowledge of incentives to HRIS users among the interviewees. In Figure 6.13, the code created within this category was the belief that there are some HRIS use incentives at 12.2%. Within this category, 85.4% supported the code 'no knowledge of incentives in using HRIS'. This means that majority of the respondents have no knowledge of existing incentives for HRIS users.

Respondents EI01and EI06 stated that they did not have an idea of specific incentives for the HRIS users. They also noted that everyone was expected to get an incentive managed by the line managers, approved by the hospital manager, and sent to the HRD in the substructure.

 Respondent EI02 also contended that "The annual incentive is supposedly for everyone. Still, it is not effective anymore". However, Respondents EI03 and MI01 concur that they only knew of incentives that were given through the Performance Management Information System (PERMIS) and not to HRIS users specifically.

This shows that most respondents indicated that they did not have any idea of special incentives for HRIS users; incentives were supposed to be across the board. Still, incentives were not as effective as expected, which also boiled down to the demoralisation of the health workforce.

6.4.1.2.2.4 Teamwork and staff participation in HRIS usage in public health

The category - *Teamwork and staff participation in the use of HRIS* in the health sector was created to capture the knowledge of the interviewees. In Figure 6.13, the codes within the category were: i) 24.4% no effective teamwork and staff participation in HRIS use and ii) 29.3% teamwork availability to facilitate HRIS. Within this category, the code 'not aware of any teamwork' was evident that 39% of the participants are more than the identified codes. This shows that most of the respondents are not aware of any teamwork in HRIS usage. Respondent MI03 indicated that "Someone does capture in HRIS and someone else approves, but they are not aware of its existence". Respondent RI15 concurred: "HRIS is centralised and does not empower workers to have access to do things themselves, which does not encourage teamwork". Respondent RI09 also noted that "In the hospitals, the HR function is a one-person function (hospital manager), and that does not guarantee teamwork".

This shows that most of the participants are not aware of any teamwork in using HRIS in the health sector because most of them were not familiar with it and did not make use of or have access to the system.

6.4.1.2.2.5 Confidentiality and security in the use of HRIS in public health

The theme of confidentiality and security of HRIS usage was created to capture the participants' knowledge of the privacy of information in the HRIS. In Figure 6.13, the codes created within this category were: i) 12.2% on passwords ensuring confidentiality and ii) 14.6% for no confidentiality. Within the theme, the code "it seems there is confidentiality" was evident that 70.7% of the participants are more than the other codes. This shows that most of the respondents seem to agree that there is confidentiality and security of information in HRIS. Respondents EI01, EI06, MI01, MI07, MI09, RI05, and RI06 agreed and believed that everyone that had access was given a unique PERSAL number and login pin to access the system.

Respondent MI04 was also of the view that "Everyone in the HRD signed a confidentiality clause not to disclose any information from the HRD or else they will be dismissed". Respondents MI03 and RI03 supported respondent MI04 by stating that they had a secured PERSAL system that no one could access without a password. The system's security interface is in a separate workstation. This strategy ensured that management could view who had logged into HRIS and what computer was used to log in.

However, respondent RI01 indicated that "Things are still done manually at numerous hospitals" in HR. They highlighted "the fact that people submit their leave and other documents

manually to the Personal Assistant (PA) to the Secretary of the hospital manager, [and later] come and see their leave papers lying at the PA's desk open where everyone sees it". They believed that this "breaches their privacy". Respondent RI02 was also of the view that "some hospitals do make a habit of employing casual workers to handle the permanent worker's HR confidential documents manually, so there is lack of privacy and confidentiality of their personnel information".

This shows that most of the participants believed that there was confidentiality and security in HRIS where users sign a confidentiality clause and use passwords to access. The fact that hospitals without HRIS still used the manual system and employ casual workers to handle the personnel documents of workers was a breach of confidentiality. The lack of biometric access to the system was also a challenge.

6.4.1.2.2.6 Other reasons depriving effective HRIS usage in the public health sector

Some of the participants highlighted some other reasons that deprive HRIS of effective usage in the public health sector. In Figure 6.13: i) poor HRIS saturation was evident in 22% of the participants. Also apparent in the data was ii) lack of an HRIS audit at 2.4%. The respondents mentioned that an external auditor had never checked the information captured on PERSAL and how it worked; only the generated reports were audited, which was not appropriate.

6.4.1.2.3   Summary of HRIS impact on the performance of the public health sector

Based on sub-section (6.4.1.2.2) analysis, a summary output of the impact of HRIS on the performance of the health sector is provided in Figure 6.15:
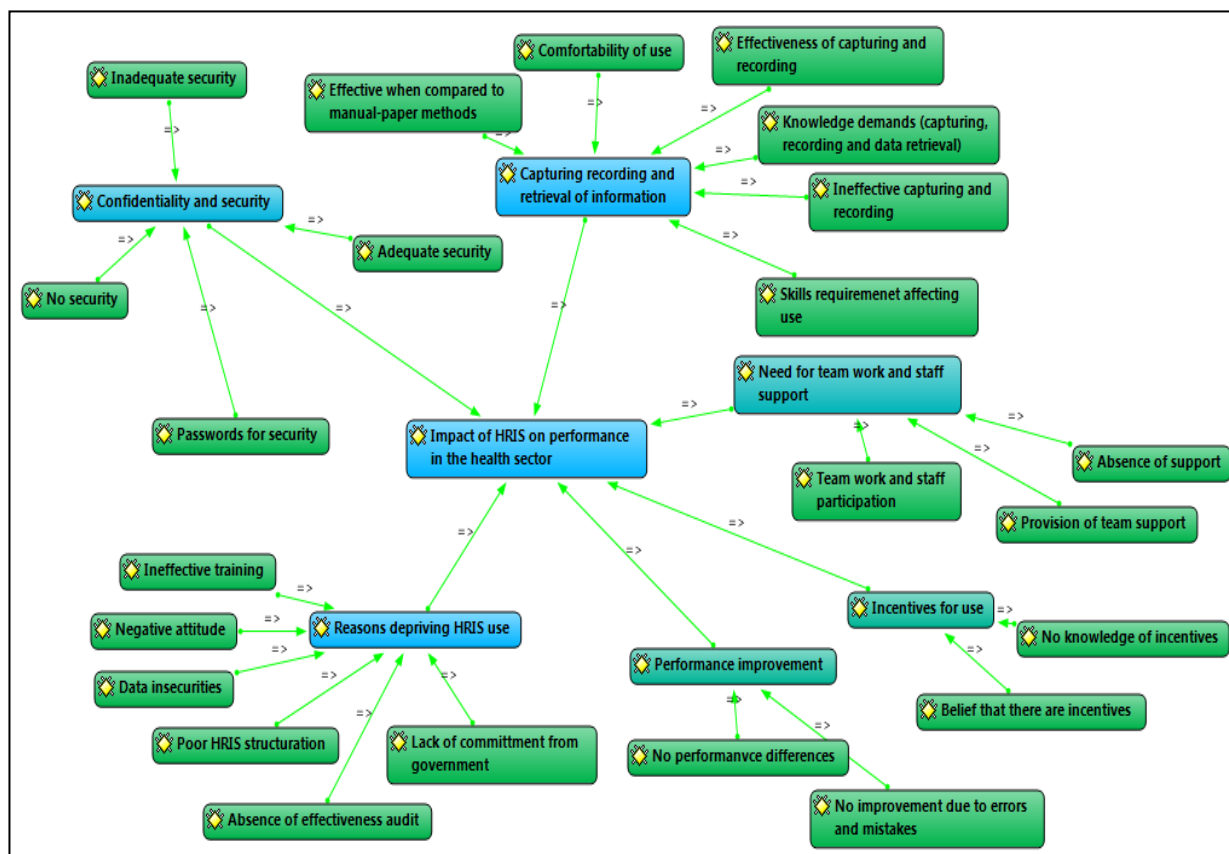
Figure 6.15: Summary of the impact of HRIS on the performance of health sector

Following the summary of the impact of HRIS on the performance of the health sector provided in Figure 6.15, HRIS was found to have some important implications in the health sector. Still, it faced severe challenges such as inadequate training, security issues, lack of teamwork, absence of an external audit, lack of incentives, and poor structure of the HR function amongst others.

6.4.2   Impact of HRIS usage to monitor and retain the skilled health workforce

(RQ2: - What impact does HRIS usage have on monitoring and retaining the skilled workforce in the health sector?)

The second research question can be restated: *What impact does HRIS usage have on monitoring and retaining the skilled workforce in the health sector*? In attending to this, the first sub-research question assessed perceptions on how HRIS can be used to manage health sector employees. The assumption held in exploring this sub-question was that satisfaction with HRIS in the health sector could lead to the retention of skilled employees and enhance

staff monitoring systems. In assessing how HRIS can be used to manage the health workforce for retention purposes, the researcher posed questions to identify the process of HRIS usage in the management of health workers. This section analyses the data collected in response to the research questions.

6.4.2.1 *HRIS usage in the management of skilled health workers*

(SRQ2.1: How can HRIS be used to manage health sector workers?)

This theme assesses HRIS assistance to the health sector to manage the skilled health workforce for sustainability and retention purposes. The researcher posed questions to identify ways to manage workers using HRIS to create a comfortable technological working environment. This section analyses data collected in response to the research questions.
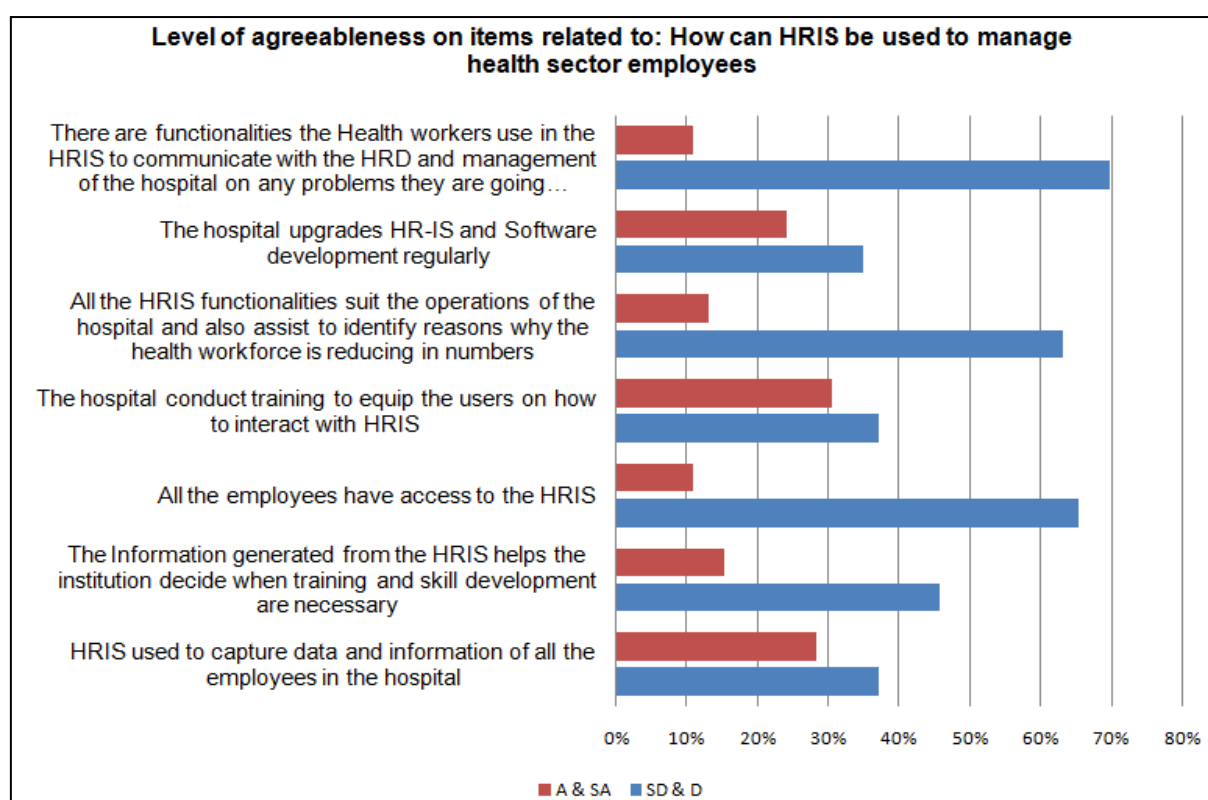
Figure 6.16: Quantitative responses to assertions indicating how HRIS can be used to manage health sector employees

6.4.2.1.1 *Quantitative analysis of the response on HRIS usage to manage the skilled health workforce*

Figure 6.16 depicts the prevalence of negative and disagreement responses to how HRIS can be used to manage health sector employees. Most prominent was a high level of variance (70%) to the assertion that the health workers use functionalities in the HRIS to communicate with HRD and management of the hospitals. The level of agreement with this assertion was low (11%). This demonstrates a likely failure of existing HRIS systems to attend to potential issues that can improve the retention of skilled personnel. This can point to weak grievance resolution, poor employee development procedures and weak responsiveness to HR issues, leading to high employee turnover. This could also be resolved through effective communication. The high disagreement (63%) with the statement that HRIS functionalities suited the hospital's operations was of concern in informing why skilled personnel were leaving the public hospitals.

Furthermore, the results of this analysis indicate low satisfaction with the present way in which HRIS is being used to manage health sector employees. 34.7% of the participants disagreed that they performed upgrades of HRIS in the health sector, and 65.2% disagreed that all employees have access to HRIS. Furthermore, 37% also indicated that they did not use HRIS to capture the details of all the skilled workers in the public health sector. 36.9% also disagreed that training in the health sector was conducted through the HRIS; 45.7% gave a negative response to the statement that HRIS can assist in identifying those eligible for training in the health sector. This is evident that the HRIS is not sophisticated and upgraded to allow workers access and capture details of entire skilled workers in the public health sector.

HRIS usage to manage public health sector workers

- HRIS functionalities to interact with HRD & management: 15%, 78%, 7%
- HRIS upgrades software development: 51%, 27%, 22%
- HRIS functionalities to identify resignation: 39%, 56%, 5%
- Training to equip HRIS users: 24%, 46%, 29%
- All employees have access to HRIS: 12%, 85%, 2%
- Capture details of all employees in HRIS: 32%, 49%, 20%

NOTE: (i) No idea, (ii) No, (iii) Yes
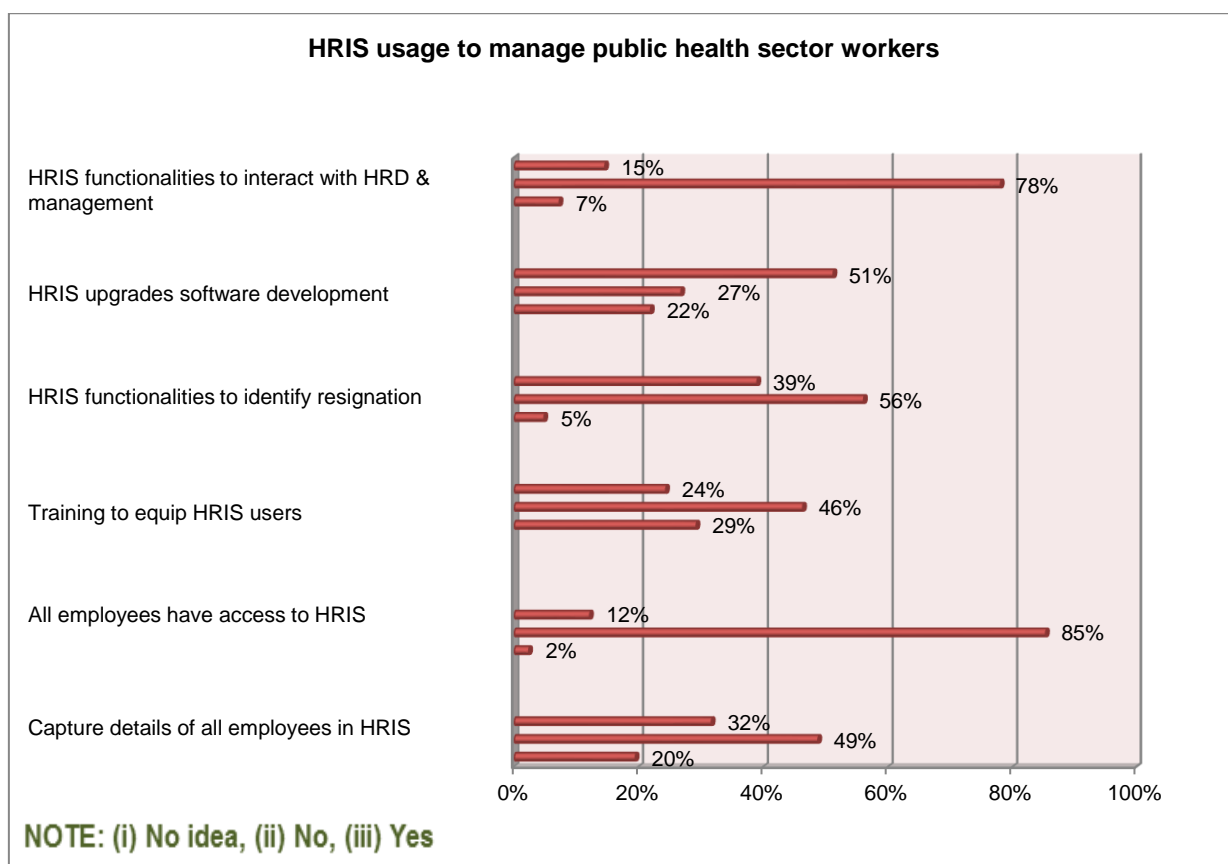
Figure 6.17: Qualitative responses on how HRIS can be used to manage public health sector employees

6.4.2.1.2 Qualitative analysis of HRIS usage to manage skilled health sector employees

The categories were collected for the question items linked to sub-research question 2.1. The quantitative data from Figure 6.17 provides the categories and percentage frequency to demonstrate the management of workers using HRIS, followed by a qualitative analysis of the findings. Figure 6.17 summarises the findings on HRIS usage to manage the skilled workforce.

6.4.2.1.2.1 HRIS Functionalities that allow workers to interact with the HRD and management

The category - *Identifying HRIS functionalities that allow the workers, in general, to access and communicate with HRD and management on work-related problems* was created to capture the knowledge of the participants regarding such functionalities. In Figure 6.17, the indication is that 78% of the participants disagreed on the existence of HRIS functionalities that allow the health workers to communicate with the HRD and management.

Respondents RI04 and RI10 mentioned that no functional HRIS existed, but at the facility level, they had a manual system in place to report to the superiors on their problems. And if they were not satisfied, they could go to the hospital manager. If not satisfied, they would get permission from the hospital manager to go to HRD in the substructure to make their complaints.

Respondent EI08 was also of the opinion that "the workers come to them (HR person) for their HR queries. They relay the queries to the substructure on the worker's behalf".

This shows that most of the selected hospitals do not have functionalities in the HRIS to communicate with authorities; roles are performed manually in most of the hospitals due to a lack of computers and other technological infrastructure.

6.4.2.1.2.2 HRIS software upgrades and development in public health

The category - *Upgrades of HRIS software and development in the health sector* was created to capture the knowledge of the participants regarding regular upgrades of HRIS software. In Figure 6.17, there is a 22% level of agreement that upgrades take place regularly. Most of the participants were not aware of system upgrades because they were not using HRIS. Some of the participants did not respond to the upgrade question because they were unfamiliar with HRIS. There was disagreement among 27% of the respondents on regular upgrades of HRIS software development. However, 51% indicated their unawareness of upgrades on the system is evident in the study. Respondent MI02 stated that "the system has never been upgraded since it was acquired, so they are still using the old system". Respondent DI03 is in line with respondent MI02 by stating that: "we are not sure of upgrades because the system is old school and primitive". Respondent MI07 also commented that "we have never heard of any upgrade since working in the hospital".

This indicates that more respondents believe that the current HRIS (PERSAL) system used in the public health sector of SA is still at a primitive stage and has never been upgraded since it was acquired. They are unfamiliar with the system.

6.4.2.1.2.3 HRIS functionalities that suit the operation of the public health sector and identify reasons for resignation

The category - *HRIS functionalities that suit the operation of the health sector and identify reasons why people are resigning* was created to capture information concerning the existence of HRIS functionalities to assist in identifying workforce resignation. In Figure 6.17, the indication is that 56% of the participants disagreed with the presence of HRIS

functionalities that help to identify why people are resigning. Although 39% of the participants are not aware of the answers to the question, 5% agreed that there is an HRIS functionality that identifies why people are resigning, but not in use.

Respondents DI04 and MI01 disagreed in mentioning that there is no feedback from the HRIS to identify why people are leaving the health sector". However, respondent MI02 stated that "When they capture appointments on PERSAL, there is a column that requires a reason why someone is leaving, but it is not in use and also it is not enough to solve the problem of resignation in the health sector". Respondents RI02, R104, R106 and RI13 also concur with the above by indicating that when someone is resigning, there is usually an exit interview (on why you are leaving or retiring), but the public health sector is not making good use of the information.

This shows that there is a column for capturing reasons why people are resigning from the HRIS (PERSAL), but such columns are not effectively used to record exit interviews and other reasons for resignation, which is a challenge to public health sector. Also, the exit interviews are not effectively utilised for strategic decisions concerning workforce retention.

6.4.2.1.2.4 Conduct training to equip HRIS users in public health

The category - *Hospitals conduct training to equip workers to interact with HRIS* was created to capture the information on the availability of training equipped workers on HRIS. As shown in Figure 6.17, 24% of the participants are not aware of training opportunities on how to interact with HRIS, though 29% agreed there is training to equip users. The disagreement (46% of the participants) on the existence of training for all skilled health workers to interact with HRIS is evidence that training is not broad-based.

Respondents EI03, EI08, RI03 and RI15 believe that training should be for only the HRIS users and should not be broad-based. Respondent MI01 asserted that "Training on PERSAL is not [done] in their hospital. The WCPDHW does the training for PERSAL users only. Such training is long overdue because the current system is not sophisticated for upgrades that require and supports training".

Respondent MI02 concurs that "Only HR workers are trained on different [facets and components] that they work on. Still, it has been long since they were trained".
A typical view of the responses suggests that; i) training opportunities were staggered, ii) training was long overdue, and iii) opportunities for training to adapt and or become conversant with the system were not broad-based.

6.4.2.1.2.5 All employees' access to HRIS in the public health sector

This category was crafted to capture the participants' knowledge of access to HRIS. 12% of the participants did not respond to the question on access to HRIS, and 2% believed that all employees have access, as seen in Figure 6.17. 85% of the participants pointed out that the skilled health workers did not have access to HRIS probably due to a lack of use of the self-service and other relevant access functionalities. Respondent MI03 indicated that "not all employees have access, only certain HR staffs have access, an HR intern might not have access". Respondent MI04 also mentioned that "only the HR people and one person in finance have access".

Respondent MI01 also indicated that "PERSAL is a system that they can find any permanent worker in WC and SA in general. Also, the users can work only on the people in their component and view their profile on the system. Still, they cannot capture or alter anything on their profile". Respondents RI02, RI07, and RI14 believed that they do have someone that does the HR work manually and sends the documents in a bag to the substructure, which demoralises the workers.

This indicates that not all skilled health workers have access to HRIS because the system is old and not upgraded to allow workers access through self-service. Could this result from a lack of awareness, training, and poor technological infrastructures?

6.4.2.1.2.6 HRIS assists in identifying when training and skills development are needed in public health

This category - *HRIS assistance to the health sector in identifying when training and development are required* – was created to capture participants' knowledge of HRIS's capacity for identifying when training and development opportunities are available. 45.7% of the participants are not aware of HRIS assistance in identifying training and skills development needs. In Figure 6.16, most respondents indicated they were unaware of any available skills development.

6.4.2.1.2.7 Capture details of all the employees in HRIS in public health

The category - *HRIS used to capture all workers in the public health sector* was created to capture the knowledge of the participants on the use of HRIS to keep the personal information of the whole team of health workers. Figure 6.17 shows that 32% of the participants are not

aware of HRIS usage to capture details of all the workers in the public health sector, though 20% agreed that HRIS captures details of all workers. 49% of the participants indicate that the current HRIS (PERSAL) is not used to capture the personal details of the entire health workforce. According to respondents EI02 and RI08, they did not know what HR captured, but they believe they capture only the permanent staff, not locums, volunteers, casual workers, contract workers or security staff. Respondents EI04 and RI07 support Respondents EI02 and RI08 in indicating that they do not capture details of locums, and contract staff on PERSAL, only permanent staff employed through the WCPDHW or NDHSA with PERSAL unique numbers are captured on the system. Respondents MI03 and RI12 are in line with Respondents EI04 and RI07 and concur that only workers with PERSAL numbers are captured, while locums, volunteers and other workers are paid through the facility's finance.

This indicates that the current HRIS (PERSAL) does not capture the details of all health workers; only the permanent workers employed through WCPDHW and NDHSA with PERSAL numbers are captured, making it challenging to identify several categories of skilled health workers available in the country's public health sector.

6.4.2.1.3 Summary of the HRIS usage to monitor and manage the workforce in the public health sector

Based on sub-section (6.4.2.1.2) analysis, a summary output of HRIS usage to monitor and manage the workforce in the health sector is provided in Figure 6.18
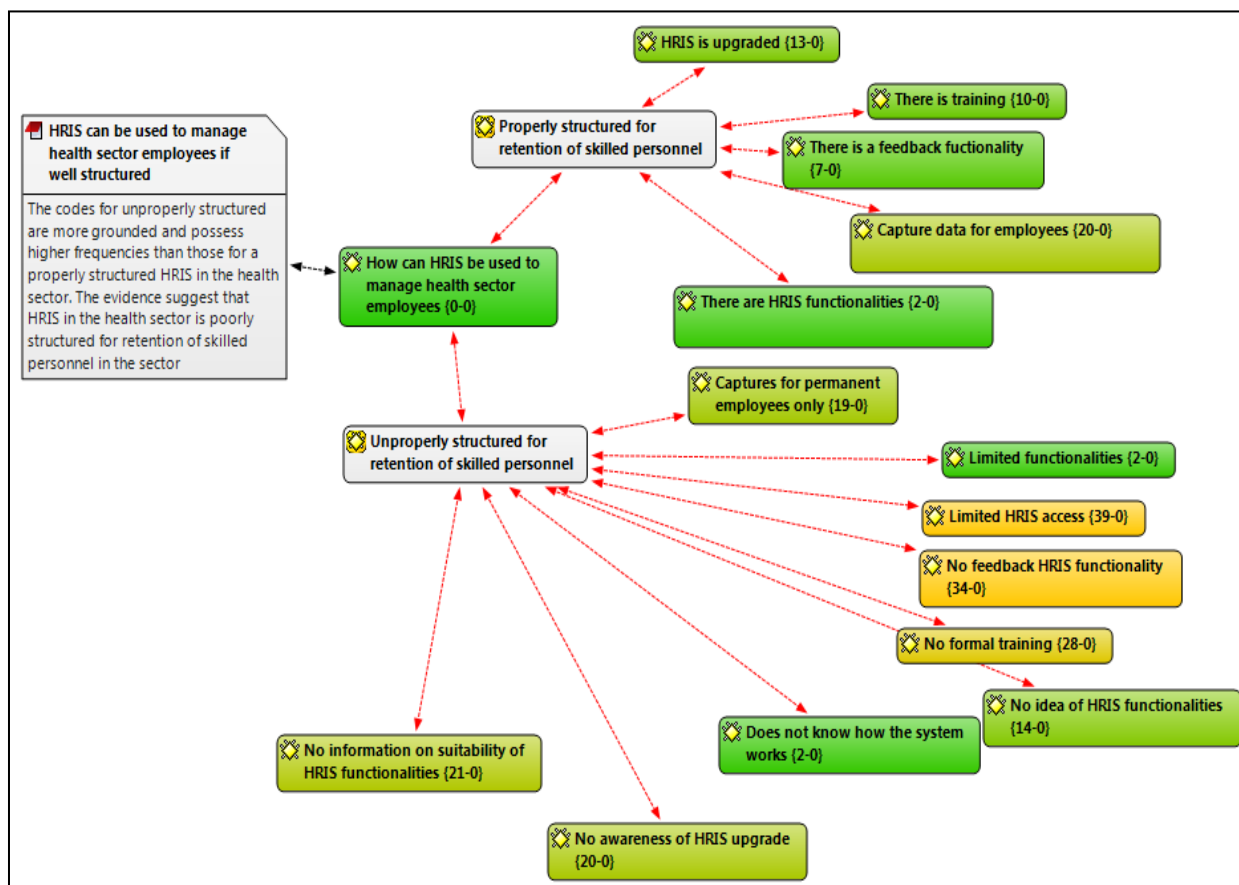
Figure 6.18: Summary of data on HRIS usage to monitor and manage the skilled health workforce

Following the summary of how HRIS is used to manage the public health sector workers provided in Figure 6.18, it is necessary to consider the qualitative data to establish any complementarities and data convergence necessary for understanding the study. This is shown in Figure 6.18. The code analysis initially considered whether HRIS is appropriately structured for effective management of skilled health sector employees and, secondly, whether the structure is ineffective. The analysis presented in Figure 6.18 was done using ATLAS.ti, software for data analysis, which uses the groundedness of a code to show how frequently it appears (Smit, 2002). In the analysis, codes were coloured based on groundedness. Code groundedness is also shown as the first number in the brackets at the end of each code. Codes related to the observation that **"HRIS in public health is improperly structured and ineffective for skilled employee retention"** were more grounded than those related to a well-structured HRIS. This was also explained through the box inserted into Figure 6.18 (HRIS can be used to manage employees if well structured). However, most (groundedness – 34) respondents did not provide data on the functionality of HRIS, while many (groundedness – 39) indicated that they had limited HRIS access. There were significant indications that many

employees lacked adequate knowledge of how HRIS is structured or managed in the health sector. As indicated in an earlier analysis, a significantly more favourable response was that HRIS captures information better than a manual system.

6.4.2.1.4   Assessment of how HRIS can be used to perform HR roles

HRIS can perform specific HR roles that are requisite for the effective monitoring and retention of workers in organisations, including the public health sector. From this study, specific HR roles were identified and submitted to the participants for response and the results are shown in Figure 6.19.
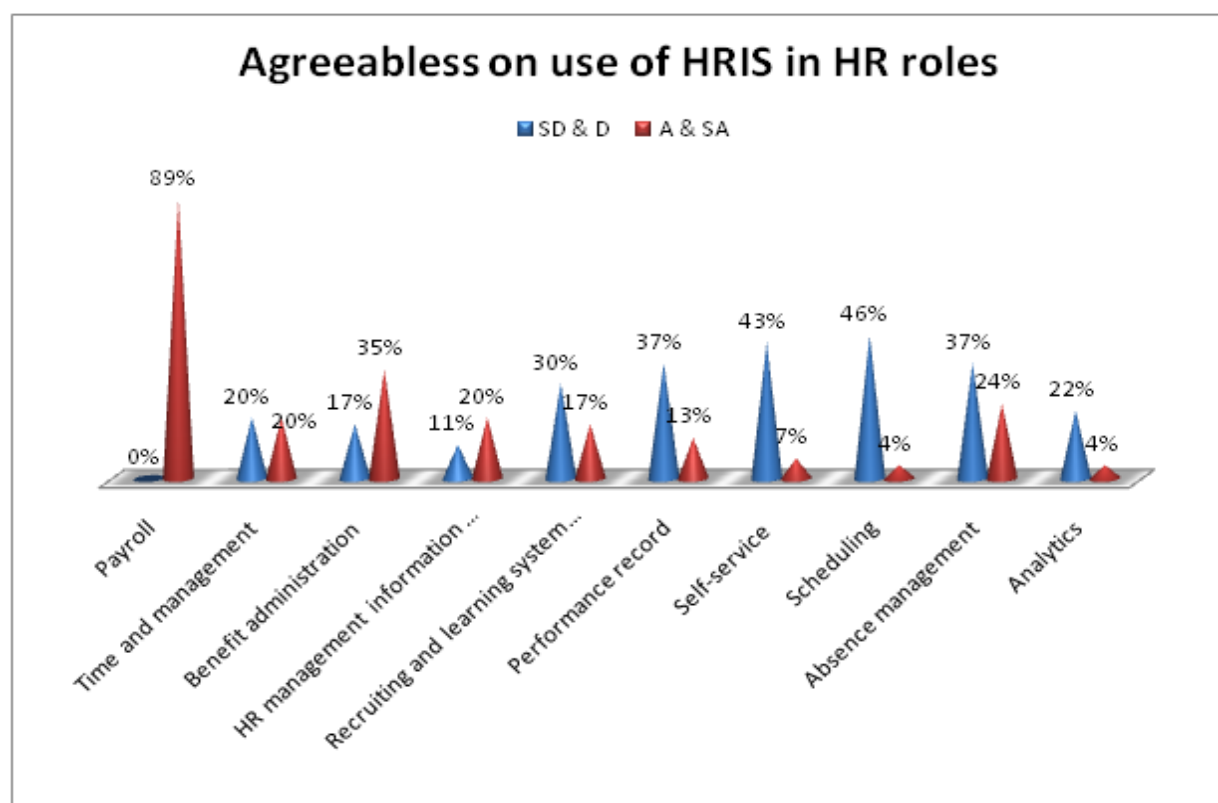
Figure 6.19: Themes from responses on HRIS used to manage health sector employees

6.4.2.1.4.1 Payroll

In Figure 6.19, it is evident that 89% of the participants agreed that HRIS is used for payroll in the health sector. Respondents MI01, MI02, MI07, MI08, EI07, EI11, MI03, MI09 and MI04 mentioned that they do have a payroll in the PERSAL system. This indicates that they do have payroll on PERSAL because payroll is the major reason organisations acquire HRIS.

6.4.2.1.4.2 Time and attendance management

In Figure 6.19, most (60%) of the participants indicated their unawareness of the time and attendance role in HRIS because they are probably not working with the system. Other participants both agreed and disagreed equally at 20%, respectively. Respondent EI04 indicated that time and attendance is recorded manually on the attendance register; none of the facilities used a clocking system, fingerprint recognition, or other systems for time and attendance. Respondents MI03, MI04 and RI04 also stated that time and attendance were not recorded on HRIS (PERSAL) but were done manually.

This indicates that time and attendance management are done manually and not on HRIS (PERSAL). It is conducted through an attendance register kept at the entrance of hospitals for workers to sign in and out of work. The manual system makes it challenging to monitor workers in public hospitals.

6.4.2.1.4.3 Benefit administration

As Figure 6.19 indicates, some of the participants were not aware of the benefits administration role in the HRIS because they were not working with the system, and 17% disagreed. However, 35% of the participants indicated awareness of the benefits administration role of PERSAL. It covers pension funds, and other related long-term benefits, of which the HRIS (PERSAL) keeps the record. The fact that the health workers do not have access to HRIS to monitor and update their details is usually prone to inaccuracy and challenging. Respondents MI01, MI02, MI03 and MI04 agreed that they did have the basic information on benefits administration on PERSAL.

This indicates that they did have the information of benefits administration such as pension fund and other benefits on HRIS (PERSAL). Still, the fact that workers were not allowed to have access to HRIS is a challenge which, most times the information gets to the people at the wrong time wrongly or not properly captured.

6.4.2.1.4.4 Recruiting and learning system

Figure 6.19 indicates that most participants were not aware of HRIS usage for recruiting and learning systems in the public health sector since they were not familiar with the system. The data (17%) gave a positive response. 30% of the participants did indicate that the recruiting and learning roles were not performed in the HRIS (PERSAL). Respondents MI03 and MI04 agreed that they had only basic recruiting and training information on the HRIS, but the roles are manually conducted and not through the system.

Respondent RI04 also indicated that "PERSAL only keeps a recruiting and training record but does not engage in their process". Respondent MI02 disagreed that they did not have such roles on the HRIS. This shows that recruiting and learning roles are conducted manually and not through the HRIS; moreover, the system is only used for basic salary payments.

6.4.2.1.4.5 Performance appraisals/record

Figure 6.19 shows that most of the selected participants did not work with HRIS, which made them unaware of the role of performance record keeping in the HRIS, and (13%), agreed that they were aware of such records. The study further showed that 37% of the participants indicated that performance records and appraisals were not captured on HRIS (PERSAL). Respondent RI14 mentioned that "PERSAL is just for record purposes and not used for staff performance management system (SPMS)". Respondent EI04 supports Respondent RI14 because "the performance system is done on a separate system called Performance Management Information System (PERMIS)".

This indicates that the public health sector does not conduct performance appraisals of their skilled workers on HRIS. They make use of PERMIS for performance appraisals and the reports get transferred to HRIS. The two systems are not synchronised, which limits the effective use of HRIS.

6.4.2.1.4.6 Self-service

Most participants are not familiar with HRIS, so they are not aware of what self-service means and how it relates to HRIS. In Figure 6.19, 7% gave a positive response to the use of self-service. 43% of the participants indicated that they did not have a self-service role in the HRIS used in the health sector in SA because the system was ancient and not sophisticated with respect to the latest technology. Respondents MI02, MI03 and MI04 indicated that they did not have self-service on the current HRIS used in the health sector of SA.

This suggests that the health sector does not use self-service roles where the skilled workers can have access to log into the HRIS, view their personal information and capture some basic data rather than sending the documents to HRD to capture.

6.4.2.1.4.7 Scheduling

Most participants are not working with HR and do not have access to HRIS; they are not aware of HRIS usage for scheduling in the public health sector. As shown in Figure 6.19, 4% gave a positive response to the question. 46% of the participants disagreed with the use of HRIS for the scheduling role of HR. This is because scheduling is done manually in public hospitals.

Respondents MI02 and MI03 mentioned that they do not have scheduling on PERSAL. Respondent RI04 also indicated that "scheduling is done manually and not on PERSAL. This suggests that the public health sector does job scheduling manually and not in HRIS, which is a setback in the use of HRIS.

6.4.2.1.4.8 Absence management

Most of the participants were not aware of whether HRIS is used to conduct absence management. It is evident in Figure 6.19 that 37% of the participants disagreed that HRIS is for absence management. 24% agreed that HRIS is used for absence management. In the view of the majority, absence management is conducted manually.

Respondents MI02 and MI03 indicated that they did have absence management, but that it was manual. Respondent MI04 also mentioned that recording of short hours (leaving early from work and coming late to work) is paper based. This indicates that absence management is done manually and not through the HRIS.

6.4.2.1.4.9 Analytics

Most participants are not aware of HRIS usage for analytics in the health sector. In Figure 6.19, 4% agreed that HRIS is used for analytics. However, 22% of the participants made it known that the health sector does not use HRIS for analytics because the system is only for administrative and not strategic.

Respondents MI01and MI03 mentioned that PERSAL is not used for strategic decisions and does not have analytics. Respondent MI02 is in line with Respondents MI01 and MI03 said that they do not use analytics in the public health sector. This is an indication that analytics is not on HRIS (PERSAL), and the public health sector does not make use of analytics to support skilled health workforce retention.

In summary of the assessment of how HRIS can be used to perform HR roles, it was observed that payroll is conducted in PERSAL. Benefits administration, absence management, recruiting and learning are conducted in different forms, and only basic HR information is captured on PERSAL. Also, performance appraisals are conducted in another system known as PERMIS and are not linked to PERSAL. Scheduling, time, and attendance are manually conducted and not on PERSAL. Finally, analytics and self-service are not on PERSAL and not in use in the public health sector. This is an indication that the HRIS does not have the functionalities of a sophisticated system, only functions for basic administrative purposes.

6.4.2.1.5   *Other HRIS functionalities identified by the respondents in the public health sector*

Some of the respondents were able to identify the functionalities in the HRIS (PERSAL) of the health sector. Respondent MI03 mentioned that "there are 5 subsections of PERSAL known as personnel management, labour relations, disciplinary, salaries and leave allowance and deductions (tax, pension, provident fund and other deductions)".

Respondent MI01 also indicated that "PERSAL is divided into: "i) personnel and ii) deductions. The personnel are from appointment, allowances, basic leave".

This shows that the respondents identified the functionalities in PERSAL used in the public health sector as: i) personnel management, ii) labour relations, iii), disciplinary issues, iv) salaries and leave allowance, and v) deductions. It also shows that most of the functionalities mentioned are part of the basic payroll administration and benefits administration. The functionalities that stood out were labour relations and disciplinary procedures.

6.4.2.2 *HRIS assistance in the retention of skilled health workforce in the public health sector*

(SRQ2.2: How does HRIS assist the health sector in encouraging skilled workforce retention?)
In assessing the HRIS assistance to the health sector to encourage workforce retention, the researcher posed questions to identify how HRIS can be used to encourage the health workforce not to resign. This section analyses data collected in response to the research questions.
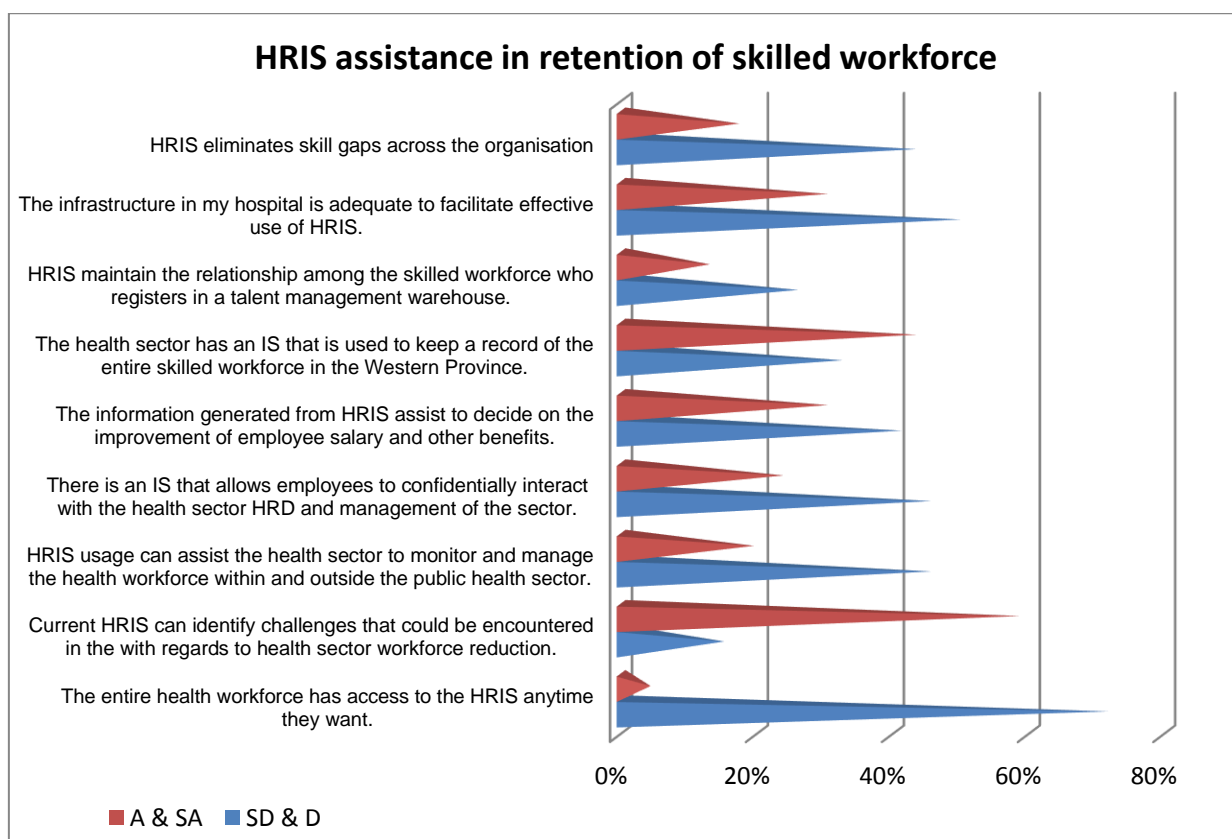
Figure 6.20: Quantitative frequency diagram on HRIS assistance in retention of the skilled health workforce

6.4.2.2.1   *Quantitative analysis of the response to HRIS assisting the public health sector to retain skilled personnel*

The categories were collected for the question items linked to sub-research question 2.2. The quantitative data from Figure 6.20 provides the categories and the percentage frequency to demonstrate the strength and support of HR roles in HRIS. Figure 6.20 shows the summary of the quantitative data findings to arrive at the information provided as follows.

The second sub-question relates to the assistance of HRIS in encouraging the retention of a skilled workforce. Figure 6.20 shows the frequencies associated with the items related to perceptions of HRIS's aid in retaining a skilled workforce. As shown in the chart (Figure 6.20), the responses were predominantly related to a disagreement with the provided assertions. However, HRIS accessibility to everyone in the organisation was heavily rejected by 80% of quantitative data participants. Other statements notably disagreed with included: HRIS eliminates skills gaps across organisations (41% disagreement); infrastructure in the organisation is adequate to facilitate effective use of HRIS (47% disagreement responses). 26.1% indicated that the system is not used to maintain the list of skilled health workers in the country, but 43.5% indicated that they have other ISs (Professional bodies) to keep records of

the entire skilled health workers in the country, not HRIS. 41.3% disagreed that the HRIS does not assist in deciding people's salary adjustments and benefits. Also, 45.7% disagreed that any IS was used to allow employees to interact with HRD and management. HRIS used cannot assist in monitoring and managing workers outside the public health sector. However, 71.7% of participants agree that the entire workforce does not have access to the HRIS used in the public health sector. These results are shown in Figure 6.20 as follows.

HRIS assists the health sector to encourage retention of skilled workers

NOTE: (i) No idea, (ii) No, (iii) Yes
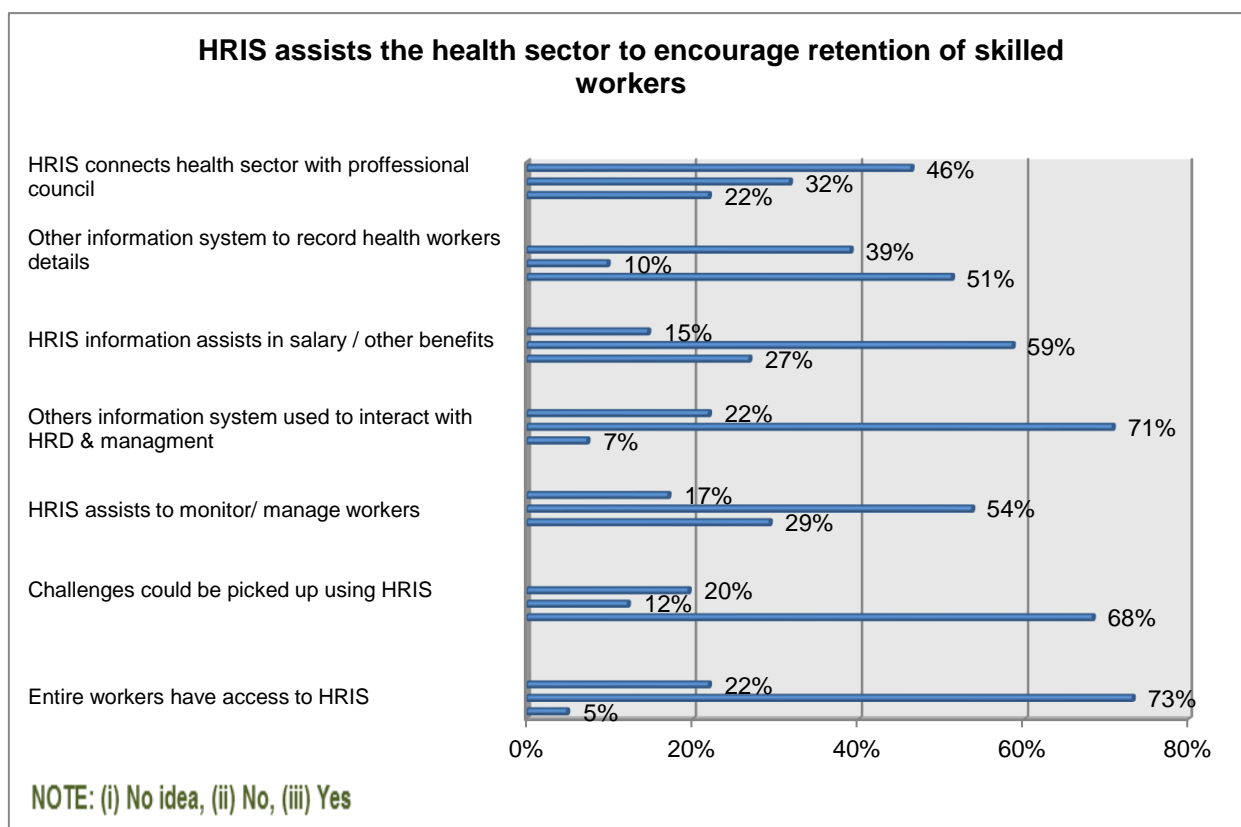
Figure 6.21: Qualitative frequency diagram of HRIS assistance regarding retention of skilled health personnel

6.4.2.2.2 *Qualitative analysis of the response to HRIS assists the public health sector in encouraging the retention of skilled personnel*

The analysis of the frequencies from the questions issued, as shown in Figure 6.21, demonstrates significant problems regarding HRIS systems and their apparent narrow use and awareness of them across the sector. Other issues include negative perceptions of its ability to identify challenges leading to highly skilled staff turnover, its inability to promote effective interaction with management and its shortcomings concerning capturing critical data. The qualitative data is analysed as follows.

6.4.2.2.2.1 HRIS eliminates skills gaps across the healthcare organisation

The category - *HRIS assists in eliminating skills gaps across the health sector* were created to capture the knowledge of the participants on the issue of skills gaps. Some of the participants had no view in response to the statement'. 17% agreed with the statement. It is evident in Figure 6.20 that 43.5% of the participants disagreed that HRIS assists in eliminating skills gaps in the health sector.

This showed that the current HRIS (PERSAL) used in the public health sector could not identify the skills gaps because it is not strategically structured. Skills gaps are manually monitored on the ground, in response to which the hospital managers can request replacements through the authorities.

6.4.2.2.2.2 Adequate infrastructure to facilitate HRIS usage in the public health

The issue of adequate infrastructure to facilitate HRIS was created to capture the knowledge of the participants in the health sector. The evidence indicated that 50% of the participants believed that adequate infrastructure was not available to support the use of HRIS in the public health sector. In Figure 6.20, 30% agreed to the available infrastructure, and some other participants did not respond to the question.

Even though the sample may not necessarily be representative, one can still argue that the infrastructures in South African public hospitals are not adequate and effective to facilitate the use of a sophisticated HRIS in the sector.

6.4.2.2.2.3 HRIS maintains relations between the professional council and the public health sector

This category was created to capture the knowledge of the participants on issues related to HRIS linking the professional bodies and the public health sector. From the data, In Figure 6.21, 22% agreed, and 32% disagreed with the statement about the relationship between HRIS and the professional council. However, it was evident that 46% of the respondents were unfamiliar with how HRIS could maintain a connection between the professional bodies and the health sector. Could this be a result of not working with HRIS?

Respondents MI01 and EI08 explained that the South African Nursing Council (SANC) recently got access to deduct nurses' annual dues from PERSAL such that payment is made directly to the council. But the South African Medical Association (SAMA) does not have access yet to deduct doctors' fees from PERSAL. Respondents MI07, MI08, RI02, RI05, and

RI14 concur that the systems do not relate because if the nurses have not paid their annual dues to SANC, HRD would not be aware of it. Still, every member is obliged to submit their proof of payment to the HRD annually.

Again, could the responses above be related to HRIS not being sophisticated enough? One also wonders whether HRIS should be linked to the management of external relationships.

6.4.2.2.2.4 Other information systems to keep a record of the entire workforce in the public health sector of Western Cape and South Africa

This category was created to capture the perception of the participants regarding the record storage of skilled health workers in the province. Figure 6.21 shows that 10% disagreed, and 39% did not respond to the statement. However, it is evident that 51% of the participants agreed that ISs are used to keep a record of the health workforce in the WC and SA, but such a system is not connected to the HRIS (PERSAL) used in the public health sector. Respondent EI13 mentioned that: "the HRD in the public health sector can pull out information of how many specialists, surgeons and nurses in the public health sector from PERSAL, but not for the entire health sector in WCPDHW". Respondents MI05, EI06 and EI11 also indicated that they thought there must be an IS used by the HPCSA, SANC and SAMA and other professional bodies that record only registered members' information.

Respondent MI03 also mentioned that "PERSAL keeps a record of all the workers with PERSAL numbers in the public health sector. Volunteers, locums, and casuals' information are not captured".

This indicates that professional bodies such as HPCSA, SANC, SAMA, and others are responsible for keeping a record of their registered skilled health workers in WC and SA. Such records might not be comprehensive enough to produce an accurate number of skilled health workers for effective management. The response to the item in sub-section (6.4.2.2.2.3 *HRIS maintain a relationship between the professional bodies and the health sector*) suggests that owing to the lack of sophisticated infrastructure, HRIS is not beneficially deployed in managing external connections such as professional bodies. The response to '6.4.2.2.2.4 *Other IS to record the entire health workforce in the WCPDHW and SA* is then curious. It is curious that an IS for records of specialists does exist with the professional council, but there is no connection with the PERSAL system used in the public health sector.

6.4.2.2.2.5 Information from HRIS assists in deciding employees' salary and other benefits in the public health

This category focused on capturing the knowledge of the participants on the determination of salaries and benefits using HRIS. 59% of the participants disagreed that HRIS aids to decide on the improvement of salaries and other benefits. As shown in Figure 6.21, 27% agreed, and 15% had no idea that HRIS assists in determining salary and benefits.

Respondent DI02 believed that

> HRIS is expected to assist in salary improvement because workers' performance does not determine salary improvement. It is determined by the years of service, qualification, and level of experience, which the PERSAL system is expected to pick up when there is a need to upgrade someone's salary and grade to the next level, but the system is not doing that.

Respondent MI03 is of the view that:

> The salary scale is pre-programmed by the maintenance people in Pretoria with salary scales every year. Also, the changes in salaries and employment of new employees are indicated in the pre-programme. Yet there is still a dysfunctional salary scaling in HRIS.

However, Respondents EI02, EI09, EI11, RI02, and RI07 indicated that they did have the PERMIS that was used to review their performance and that would determine their salary adjustment, but not HRIS.

Respondent MI04 mentioned that "PERSAL tells how much people earn but does not determine what someone is worth or should earn". Respondents EI13 and RI08 also indicated that they do have SPMS where managers would have performed an appraisal on a Key Performance Plan (KPP), such as administration, clinical governance, management, and teaching, then make a recommendation for reward, and that is not done through HRIS.

Respondent MI07 reported on the issue that "the HRIS was supposed to be picked up immediately after you are employed, but up till this very moment (date of interview), her salary update is still in arrears (9 months down the line)".

There is an indication that HRIS (PERSAL) does not assist to determine salary adjustments; such adjustments are determined by the years of service, qualification, and years of experience. Also, some respondents indicated that PERMIS is used to measure the key performance indicators of workers which are also used to measure salary adjustments. Poor government policy and lack of updates of information are why salaries are not determined through PERSAL, which requires revisiting to determine how to make effective use of HRIS.

6.4.2.2.2.6 Information system that employees use to interact with HRD and management in the public health

The category - *Information system used by employees to confidentially interact with health sector HRD and management* was created to capture the knowledge of the participants on the interaction between the health workforce and management. In Figure 6.21, 7% agreed, and 22% were unaware that IS used to interact with HRD and management. However, it is evident that 71% of the participants disagreed that the IS used by employees to interact with management and HRD in the health sector.

Respondents MI07, MI08 and MI09 indicated that the HRD has a manual system for booking appointments and walk-ins, and there is no privacy for conversation in their office. People's complaints are made in the public area in the office where everyone in HR can hear the complaints, which is unfair.

Respondent EI08 concur that "workers fill a grievance form (complaint form) and submit it to their superiors to study (manually)". Respondents RI04 and RI06 also mentioned that they were not aware of such IS functionality. Still, they did have a manual system at the facility level whereby complaints could be received by HR, and they would discuss it with the person involved and maybe with the supervisor and no one else.

All the processes mentioned in sub-section (6.4.2.2.2.6) are regarded as manual processes with no IS such as the HRIS to log in reports, book appointments, submit their leave and other HR documents in the public health sector. This indicates that they do not have an IS to interact with management and HRD. They use manual systems to make complaints, book appointments to go to HRD, fill grievance forms (complaints), walk-ins, and complain to the hospital manager for a meeting. Some of the workers are unable to use the intranet, emails, and telephone because some of the hospitals do not have the technological infrastructures to support such a process.

6.4.2.2.2.7 HRIS assists to monitor and manage the workforce within and outside the public health sector

The category - *HRIS assists the health sector to monitor and manage the health workforce within and outside the public health sector* was created to capture the knowledge of the participants concerning the management of the workforce using HRIS. In Figure 6.21, 29% agreed, and 17% did not respond to the question. 54% of the participants disagree that the HRIS assists in managing the health workforce within and outside the health sector. According

to respondents RI08 and RI13, the current system cannot monitor and manage the health workers; they would prefer a new system to do the job. Respondents EI06 and MI02 also mentioned that allowing people to access their leave from a workstation will be good, where they can also know how many people have access.

Respondent EI13 stated that "they need systems with applications such as: clock in/out IS card system, electronic verification of people's data to eliminate ghost workers, identification numbers, and signal death worker [sic]".

Also, Respondents MI03 and RI14 emphasised that they could not just appoint someone through PERSAL if a position is vacant, it remains vacant on the system until someone is appointed, then it gets captured on PERSAL. Also, there are ways of identifying vacant posts in the hospitals, which are ineffective.

Respondent MI04 remarked that "the system is accessible by the HR people. The Western Province (WP) and the Head Office (H/O) can use the system to monitor the permanent staff in the public health sector in general, identify shortages, and draw a list to identify gaps, but the system is not used for that".

They need a system to allow workers to make complaints and enquiries and do follow-ups rather than visits to substructures, and that allows direct access to authorities through the system. This shows that PERSAL could identify vacant positions and monitor workers in the entire public health system. Still, due to its unsophistication and lack of upgrades, it could not assist in performing those functions.

6.4.2.2.2.8 Entire skilled health workforce has access to HRIS at any time

The category - *Health workforce access to HRIS at any time* was created to capture the knowledge of the participants on issues related to full workforce access to HRIS. In Figure 6.21, 5% agreed, and 22% did not respond to the question. However, 73% of the participants disagreed that the entire health workforce has access to HRIS (PERSAL) any time they want. According to respondents EI06, EI07, EI13, EI12 and RI11, not everyone has access to a computer and effective HRIS; first, there must be computers available for everyone to access all the hospitals. Respondents MI01, MI06, MI08, MI09, DI02, EI08 and EI10 also mentioned that only HR staffs at the substructure and all the hospitals with HRD have access to PERSAL.

Respondents EI01 and RI05 also stated that people have to make an appointment to see the HR person working on their information at the substructure which is often frustrating. Respondents MI07, RI10 and RI14 remarked that they still had to submit

documents manually in paper form to HR before their information could be captured on PERSAL.

This indicates that the entire skilled health workforce does not have access to the PERSAL due to the lack of sufficient computers and other technology and information systems in all the hospitals, which creates the frustration of frequent visits to the substructure HRD. Only certain people in the HRD and one person in Finance have access to PERSAL at the substructures and other hospitals with HRIS.

6.4.2.2.2.9 HRIS can identify challenges the public health sector encounters concerning skilled workforce reduction

The category - *HRIS can identify challenges faced concerning health workforce reduction* was created to capture the knowledge of the participants regarding workforce reduction and HRIS. In Figure 6.21, the data showed that 12% disagreed, and 20% did not respond to the question. However, 68% of the participants agreed that there are challenges the HRIS could identify that could be encountered concerning workforce reduction. According to Respondent RI04, "PERSAL system is supposed to pick up the abuse of leave days, but it is not doing that if they can have other information systems that can be linked to PERSAL and when someone tries to log in with a wrong password or wrong information it will automatically alert the HRD".

Respondent EI02 also commented that "at the moment it is time-consuming because they have to go to the substructure to deal with HR issues rather than focusing on the workload facing the sector". Respondent RI15 is also of the opinion that "the timelessness of information to be captured on PERSAL and the delay in updating information are the problem, [for HR personnel to do their work on time and accurately] is a challenging task".

Respondent MI02 also made a remark that "the most challenging part will be people getting used to a new HRIS in terms of training the workers on the usage which is why they would prefer an upgrade and modification of the old PERSAL for convenience and having new features for effective use". Furthermore, respondent MI07 stated that "identifying challenges such as: lack of proper communication, lack of proper procedures, lack of follow-ups in a work process, lack of proper track record, lack of evidence of work done by previous HR personnel and being too busy can make someone not be able to meet up with the stipulated appointed time of HR at the substructure".

Respondent EI10 is also of the view that "it will be much easier if they have the grievance system on the HRIS so that they could voice out their anger and whatever they need help to

keep them at work, and someone can be appointed to handle such situations through the system".

This shows that the use of HRIS could pick up important challenges. These challenges include abuse of leave days, time-consuming travel to substructure and workload, the timelessness of information delay in updating, and hospital managers not having access to view their subordinates' HR document submissions. Also, manual intervention, lack of access and computers, load shedding, lack of proper communication, lack of a grievance system, lack of appropriate procedures, lack of follow-ups in a work process, lack of proper track records, lack of evidence of work done by previous HR personnel and lack of modification and convenience.

The above observations were further considered concerning qualitative data as provided in Figure 6.22, which was generated from the qualitative data analysis.

6.4.2.2.3 Summary of the HRIS assisting the public health sector in retention of skilled workforce

Based on sub-section (6.4.2.2.2) analysis, a summary output of using the HRIS to assist the health sector in encouraging the retention of a skilled workforce is provided in Figure 6.22
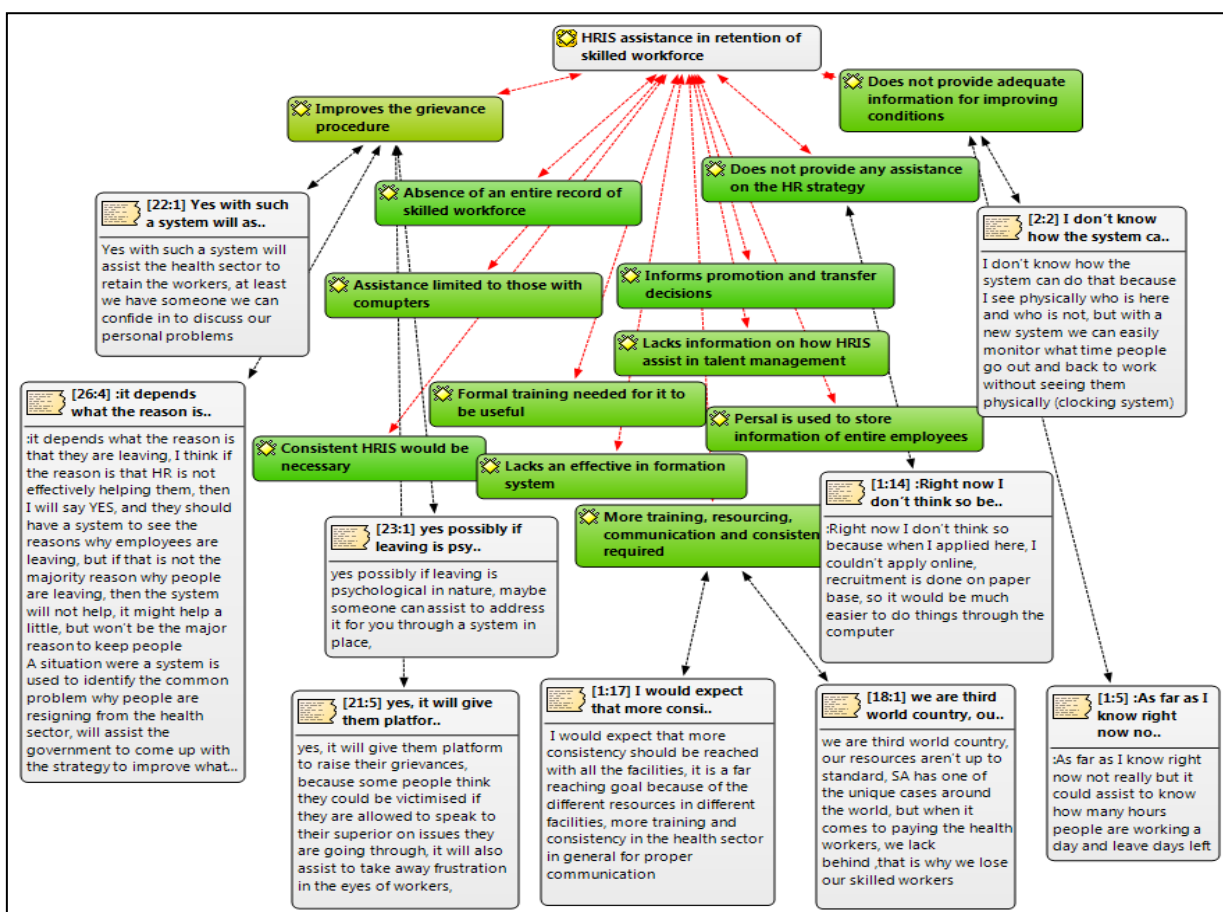
Figure 6.22: Summary of HRIS assistance in retention of skilled health workforce

In Figure 6.22, there are significant indications from the respondents which show how the HRIS, if effectively implemented, could improve the retention of a skilled workforce by improving the technological aspect of the working environment in the health sector. There were significant indications that an HRIS could improve the grievance procedure in the health sector. Further, most respondents provided suggestions on improving the HRIS framework to effectively improve the retention of a skilled workforce in the health sector. These include the requirement for HRIS to be accessible to the entire workforce and to capture data pertaining to the entire employee body comprehensively. Participants also indicated a need for formal training, teamwork and identification of transfers and promotion, skills gaps, and interaction with other ISs for effective decisions in the sector.

6.4.3   HRIS assistance in the public health sector to improve service delivery

(RQ3: - How can HRIS be utilised to assist the health sector in improving its services to the public?

The third research question stated in this study was set to inquire about the strategic role that HRIS can play in improving service delivery in the public health sector. Service delivery

represents a strategic goal, and the foundation for this research was to ensure that HRIS contributes to health institutions' strategic needs. This question subsumes all other questions like those relating to retaining a skilled workforce. It all has to lead to improved health service delivery for the public. Regarding their goal, the first sub-question highlights suggestions on how the government can support the use of HRIS to improve service delivery in the health sector.

6.4.3.1 Government support HRIS for service delivery in public health sector

(SRQ3.1: How can the government support the use of HRIS to improve service delivery in the health sector?

In assessing how the government supports the use of HRIS to improve service delivery in the health sector, the researcher posed questions to identify this kind of support from the government. The initial assessment was on respondents' impressions of how the government can support the use of HRIS to improve health service delivery. The analysis of responses to the questionnaire resulted in the generation of the frequency graph presented in Figure 6.23.
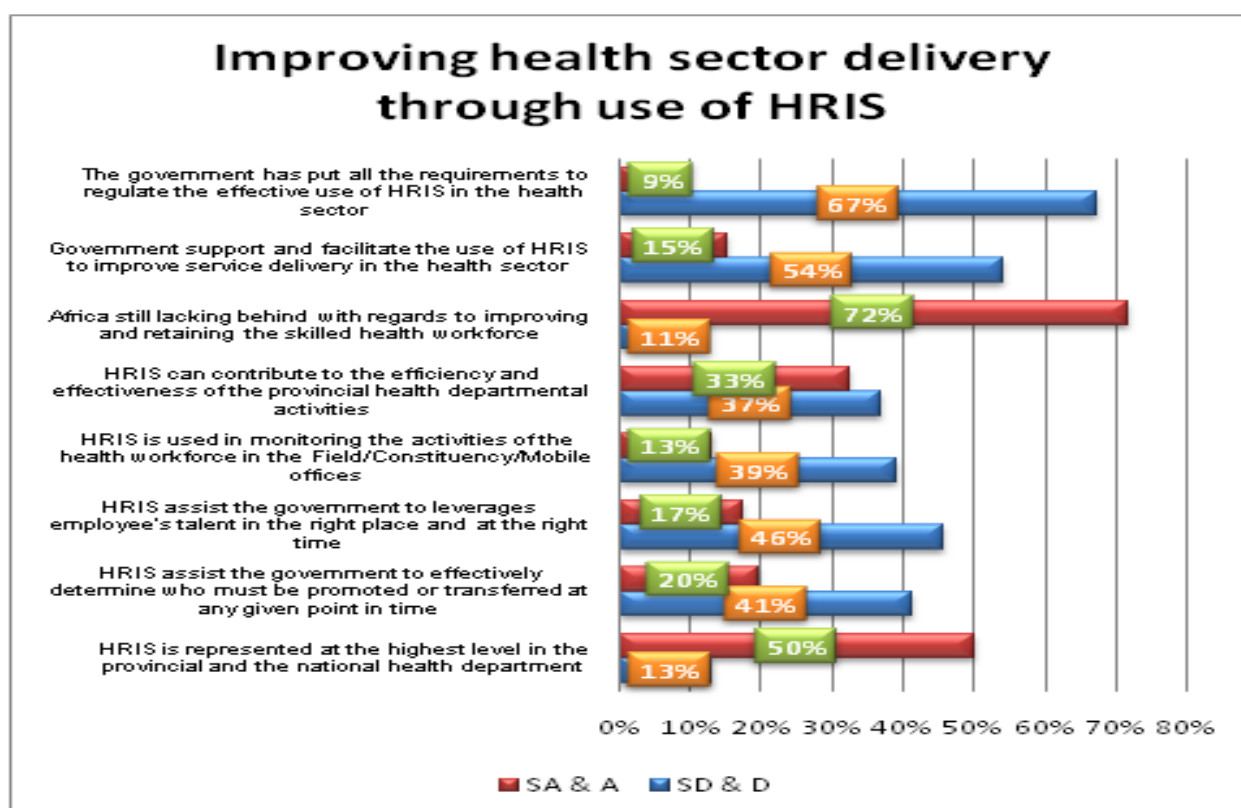
Figure 6.23: Quantitative responses on how government can support the use of HRIS to improve service delivery

6.4.3.1.1 Quantitative analysis of the response to government support for the use of HRIS to improve service delivery in public health sector

In Figure 6.23, the respondents disagreed that the government has provided all requirements for the effective regulation and administration of HRIS in the health sector. Therefore, this suggests a need for government commitment to ensure that all necessary infrastructure and other systems are in place for effective HRIS. The degree of disagreement was high (54%) concerning the assertion that the government effectively supports HRIS usage. This demonstrates a need for the government to seriously consider its commitment to the widespread and effective use of HRIS systems. There were significant 72% of participants who perceived that African countries are lacking in their support for the adoption of HRIS. As a leading emerging economy, SA ought to contribute to strengthening HRIS adoption in the health sector. 67% of the participants did not agree with available government requirements to regulate the effectiveness of the HRIS. Also, 46% disagreed that the HRIS assist the government in leveraging talents and identifying people to be promoted and transferred. It means that HRIS is not technologically strategic enough to support the sector. 50% of the participants agreed that they have superior authorities in the HRD, which indicates that the authorities are supposed to have access to and know how the system works. Furthermore, 39% disagreed that HRIS assists in monitoring the workers and, that the system cannot contribute to the effectiveness and efficiency of the health department. This indicates that the HRIS used is not effective due to a lack of government support and reliance on the system to support the health sector.

Respondents generally felt that HRIS adoption has many positive outcomes, including assistance in making HRIS decisions and generally improving service delivery. More information on the nature of government support for HRIS in the public health sector emerged from the qualitative data analysis that was done sequentially following the quantitative review. Figure 6.23 provides some of the comments obtained from respondents and how they were coded concerning the research question. As shown in Figure 6.23, despite appreciating the use of HRIS in the health sector, the respondents felt there was a need for improvement: in particular, the need to ensure that the system was rolled out holistically, engaging in HRIS effectiveness audits, and providing adequate resources for the effective use of HRIS.
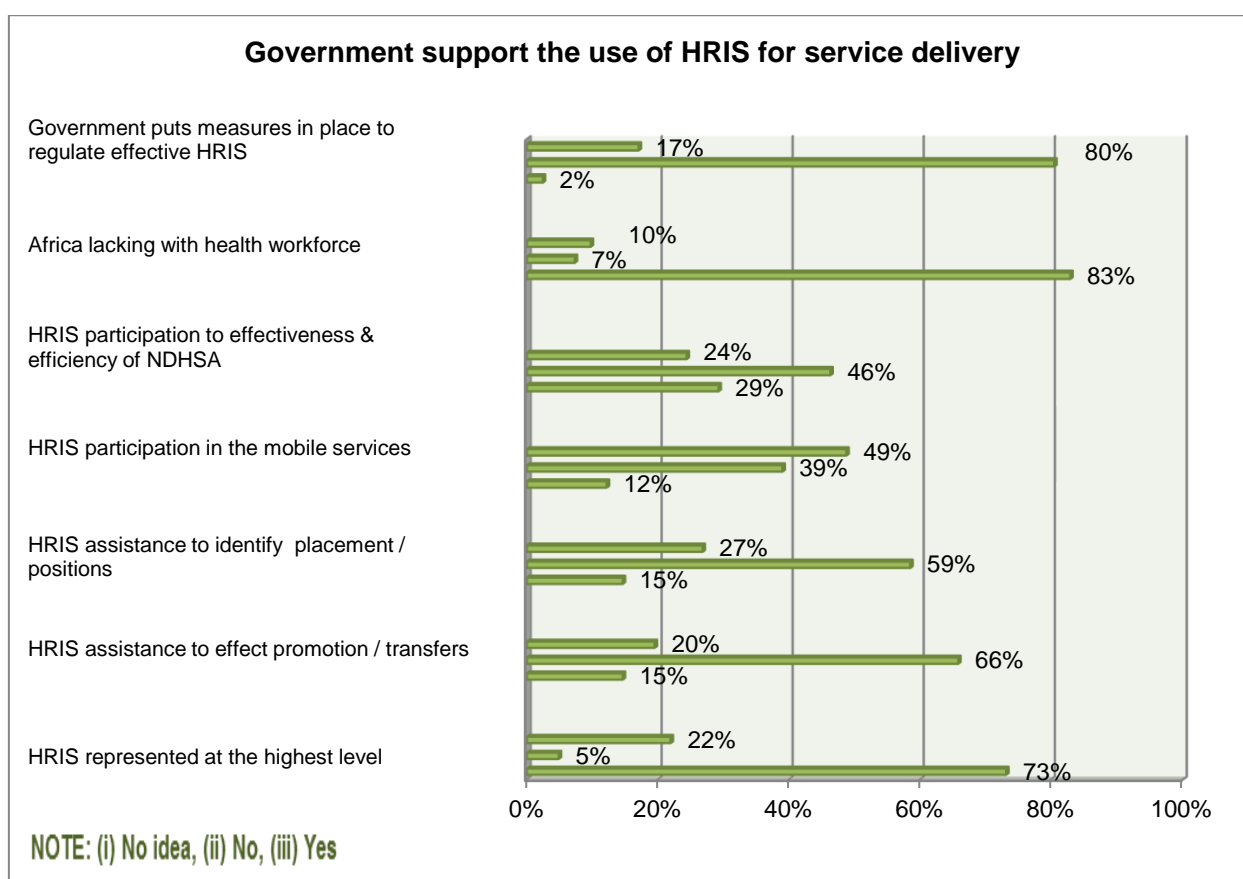
Figure 6.24: Qualitative responses on how government can support the use of HRIS to improve service delivery in public health sector

6.4.3.1.2   *Qualitative analysis of government support the use of HRIS to improve service delivery in the public health sector*

The categories were collected for the question items linked to sub-research question 3.1. The qualitative data from Figure 6.24 provides the categories and percentage frequency to demonstrate the level of government support for the use of HRIS for service delivery. The qualitative data was analysed with the combination of Figure 6.24 data. Figure 6.25 shows the summary of the data analysis findings to arrive at the information provided.

6.4.3.1.2.1 Government put measures in place to regulate effective HRIS in public health

The category - *Government to put measures in place to regulate the effective use of HRIS in the health sector* was created to capture the knowledge of the participants concerning the regulation of the health sector using HRIS. In Figure 6.23, some of the participants did not respond to the statement, and 9% agreed. 67% of the participants disagreed with the statement above. According to Respondent MI07:

> The HRD can pick up that they have worked for 3 years in a post and their salary is
> supposed to be upgraded, and they do not have to go to the substructure HR office all

the time to complain about their wrong salary grade (timelessness of upgrade), but that is not happening.

Respondents EI09 and RI14 emphasised the use of effective HRIS to make sure that staff complements are allocated to their hospitals for the efficient running of the health sector and to eliminate the waiting period. Respondent EI10 also emphasised that "they need to streamline a lot of things where HRD will be able to deliver on time and error-free environment, the clinicians can focus more on their work and not been held up with HR/Admin stress".

This indicates that the government did not put up any requirements to regulate the use of HRIS in the public health sector. The HRIS cannot pick up salary upgrades of people immediately after they are employed because it is not sophisticated. Also, the tardy capturing of information by the HRD is not accurate due to the lack of government regulations in place for an effective system.

6.4.3.1.2.2 Government supports the use of HRIS to improve service delivery in public health

The category - *Government support and facilitation of the use of HRIS to improve service delivery in the health sector* was created to capture the knowledge of the participants concerning service delivery using HRIS. In Figure 6.24, 17% of the participants were not familiar with the answer, and 2% responded positively. 80% of the participants disagreed with the notion that the government supports and facilitates the use of HRIS to improve service delivery in the health sector. According to respondents EI03, EI06, MI08, EI01 and MI09, the government was not supporting them because they needed more HR people in their hospitals for speedy HR service which could end up in better service delivery. They also expressed the need for effective HRIS that can allow online instant application and access to give everyone a chance.

Respondent RI04 was also of the opinion that "they need a better monitoring and evaluation system in place; they also need to focus on their vision, mission and objectives". The latter also pointed out that the government did provide policies and make decisions but the people on top (management) were not keen on the implementation.

Respondent MI04 suggested that:
> the government can go to the ground floor and find out how the system works for the people because they get managers that do not work on the system and do not know the challenges the users are facing, but when issues like this come up, it will help the

government to make improvements for easy access to PERSAL but at this moment, the system is not as effective as expected.

This indicates that the government might make decisions, and the management does not implement them. Also, the government are not seriously in support and facilitation of the effective use of HRIS to improve service delivery in the health sector. It appears that there is a failure on the part of the government to realise that health workers are critical to society if one considers the lack of an upgraded HRIS to allow workers access to the platform, poor infrastructure, and lack of qualified personnel skilled manpower. The absence of these will likely affect service delivery in the public health sector.

6.4.3.1.2.3 HRIS can contribute to the efficiency and effectiveness of the national department of health of South Africa's activities

The category - *HRIS can contribute to the efficiency and effectiveness of the* NDHSA *activities* was created to capture the knowledge of the participants concerning NDHSA and HRIS. 24% of the participants did not offer a response to this question. 29% responded positively, and 46% of the participants disagreed that HRIS contributes to the effectiveness and efficiency of the NDHSA, as seen in Figure 6.24. Respondent MI02 suggested that "PERSAL could be upgraded but now not good enough and not effective". Respondent MI03 emphasised that "PERSAL could be effective in its way, the system was introduced in the 1990s, and it is still a DOS version, not biometric, not in Windows or any other contemporary operating systems. The public health sector needs an HRIS with the latest technology". Respondents RI15 and DI02 also maintained that PERSAL is still a primitive system, and more work needs to be done to disseminate and improve the system.

Respondents DI03 and EI06 were also in disagreement because PERSAL is supposed to monitor everybody concerning how they perform their duties, but it is not doing that. They needed an information system in place that would help to refresh their memories of what they were required to achieve and where they were at any moment for effective health structures.

Those who disagreed (46%) were yet to see how HRIS contributed to the efficiency and effectiveness of the NDHSA. This might be due to the antiquated nature of HRIS technology in place.

6.4.3.1.2.4 HRIS usage in monitoring the activities of the skilled health workforce in mobile services

The category - *HRIS usage to monitor the activities of the health workforce in the mobile service* was created to capture the knowledge of the participants concerning the effectiveness of HRIS in monitoring the workforce in the mobile service. In Figure 6.24, 12% gave a positive response, and 49% did not respond to the question. Only 39% of the participants volunteered a response in the negative, perhaps suggesting that most of the participants were not familiar with what goes on in the HRIS.

Respondents MI08 and EI06 disagreed, stating that the mobile service is monitored manually before they go for fieldwork; they sign a manual attendance register as proof of attendance, and then the HRD will do the follow-ups on the records. Respondent EI13 also disagreed in mentioning that "monitoring the workers in mobile units is the responsibility of the line managers and not the HRIS". Respondent DI01 concurs that "there are no computers, no access to the system, which is a problem in the mobile services".

Respondent MI03 maintained that: "if not for payroll and leave management, PERSAL does not keep accurate time and make provision of how much time people must work, and no way of checking how much time people worked".

This is an indication that PERSAL does not assist in monitoring the activities of the health workforce in mobile services. There is no proper and accurate time and attendance system for immediate monitoring of the time people work. Also, there is no infrastructure or amenities such as computers, electricity, and no system access. The monitoring of workers' attendance in the mobile services is done manually, defeating the effective use of HRIS.

6.4.3.1.2.5 HRIS assists the government in leveraging employees' talent in the right place and time in the public health

The category - *HRIS assists the government in leveraging employees' talent in the right place and time* was created to capture the knowledge of the participants regarding leveraging employees' talent using HRIS. As shown in Figure 6.24, 15% agreed, 27% did not respond to the question, while 59% responded. They said they did not believe that HRIS assisted the government in leveraging employees' talent.

Respondents EI01, DI04, MI08 and MI09 disagreed, stating that it is not HRIS and the HRD that decides who must be positioned in a place; it is the management who

decides. Respondents MI01 and MI02 emphasised that HRIS did not determine people's position, the system was only for administrative and not strategic purposes. Respondent RI15 also commented that "the HRIS (PERSAL) system is not sophisticated to assist in deciding where to place workers". Respondent RI12 also indicated that "the government does not decide who must be placed in any position. The management uses a manual structure known as "changeover" to move nurses around in the hospital".

This indicates that PERSAL does not assist the government or management in determining where to place people in the health sector. People have to apply manually to be placed in the right position. Then the management decides because PERSAL is not for strategic purposes and not effective for such decisions.

6.4.3.1.2.6 HRIS assists the government in determining promotion and transfers in public health

The category - *HRIS assists the government to determine who must be promoted or transferred at any given point* was created to identify the knowledge of the participants concerning promotion and transfers using HRIS. In Figure 6.24, 15% of the participants agreed that HRIS assisted in promoting and transferring, and 20% indicated their unawareness of the answer. 66% offered a response disagreeing with the notion that HRIS assisted the government to make decisions on promotion and transfers in the health sector.

People have to apply for promotions and transfers. Could the participants' inability to respond to this item be linked to their not knowing whether HRIS assists the government in promoting and transferring workers? The unfamiliarity of some of the participants in responding will require future research to understand why this happens: maybe either due to poor framing of the questions asked or lack of knowledge, education, and awareness of HRIS.

According to Respondent DI02:

> Paygrade promotion could be necessary that PERSAL will alert for adjustments, but for transfers and promotion, people have to apply for that. PERSAL does not assist in making such decisions.

Respondents EI13 and EI06 also indicated that pay grade on salaries is automatic except if their staff performance management system (SPMS) says otherwise.

> In terms of plan progression, if your manager says your work is up to scratch every year, you get a notch (raise) in salary every year. If your Occupational Specific Dispensation (OSD) is ok as a doctor, from grade 1 you work for 5 years, you get a notch (raise) and move to grade 2. After 5 years you get a notch (raise) and move to grade 3 where you remain till you retire. At that level, your salary will keep increasing

every year, except [if] you decide to apply for a higher position like a director position or further your studies to master's or doctorate, and then your level will increase. You need to resign and reapply for a change of status.

Respondent MI08 insisted that:

The HRIS is supposed to assist in promotion and transfers, but it is not doing that most times people are sent for training to upgrade at the expense of the state and when they are back, some of the trained personnel will not retain their work in the health sector, they will be forced to go and look for a job elsewhere after being trained by the state, which boils down to state loss.

Respondent RI03 is also of the opinion that:

The hospital managers do have a manual system of nominating people for salary upgrades and not on HRIS, the hospital manager and other managers nominate people that do perform well, and then recommend them to HRD for paygrade [advancement]. On promotion and transfers, people need to reapply for that.

This shows that PERSAL does not assist the government in determining promotion and transfers in the public health sector. People need to resign from their current position and re-apply for a new position, promotion, or transfer to other facilities/sections/hospitals. The PERSAL system is not able to assist in determining such strategic decisions, which could be attributed to the current state of the system.

6.4.3.1.2.7 HRIS is represented at the highest level in the national department of health of South Africa

The category - *HRIS is represented at the highest level of the* NDHSA was created to capture the knowledge of the participants concerning the level of HRIS representation in the highest authority in the health sector. From the chart in Figure 6.24, it is evident that 73% of the participants had a positive response to the existence of HRIS at the highest authority in the health sector.

Respondents MI02, MI07, MI08, RI01, RI06, RI02, RI04, RI05, RI07, RI15, DI01, DI02, MI01, EI01, EI06, EI07, EI08, EI09, EI12 and RI12 emphasised that the NDHSA does have Deputy Directors (DDs) in HR, but do not know if they have access to make use of PERSAL. Thus, respondent EI13 believes that "most senior managers have access through their subordinates because they get fed with any HR information needed at their fingertips, but we need all workforce information to be transparent, which would require their access".

This indicates that the respondents are not aware of the superior's access to PERSAL, because they could have been able to identify the problems faced in the lack of effective use of HRIS (PERSAL) and why the system is still not upgraded to the latest technology for workforce comfort and sustainability.

6.4.3.1.2.8 South Africa still lagging with regards to retention of the skilled health workforce using HRIS

This category was created to capture the knowledge of the participants concerning the reasons why SA is lagging in the improvement and retention of a skilled workforce in the health sector using HRIS. Figure 6.24 showed that 83% of the participants agreed that SA is lagging concerning the retention of the skilled health workforce using HRIS. Respondent EI11 highlighted the fact that:

> the government introduced a 'new curriculum' for the nurses to go back to tertiary and get a degree, now they cannot apply for study leave because they had to resign and go to study, which is a problem they are facing because after studying, they might end up unemployed. This process could be effectively managed through HRIS.

Respondent RI02 held the view that:

> Because the government do not appreciate the health workers by managing them through effective systems in place, people need to be treated well, especially in the community service and long hours of work, they are taking advantage by overusing people and are not paying for the extra hours due to lack of HRIS to monitor their hard work and commitment (people are burning up).

This indicates that SA is still lagging in skilled personnel because there is no effective HRIS to assist in supporting the new curriculum by allowing people to study and then come back to retain their position. This is also part of the politics in the workplace, and the use of HRIS to support such decisions will go a long way.

6.4.3.1.3 Summary of the theme government supports the use of HRIS to improve health service delivery in public health

Based on sub-section (6.4.3.1.2) analysis, a summary output of the theme of government supports for the use of HRIS to improve health service delivery is provided in Figure 6.25.

Figure 6.25: Coding chart on government supports for the use of HRIS to improve health service delivery

Figure 6.25 summarises the results from sub-research question 3.1 which suggest insufficient support from the government for the use of HRIS. This can be attributed to lack of management access to HRIS, lack of effective policies and regulations to support the system, and not being able to upgrade the system for use in promotion, transfers, placements, and positions amongst others. This could affect service delivery in the health sector.

6.4.3.2 HRIS usage benefits in the public health sector

(SRQ3.2: What benefits could accrue in the effective use of HRIS in the health sector?)

In assessing the benefits that accrue from the effective use of HRIS in the health sector, the researcher posed questions to identify benefits that can be achieved from the effective deployment of HRIS in the sector. This section analyses the data collected in response to the research questions.

Figure 6.26: Quantitative frequency diagram of benefits that accrue from the effective use of HRIS in the public health sector

6.4.3.2.1 *Quantitative data analysis of benefits that accrue in the effective use of HRIS in public health*

The categories were collected from the sub-research question items linked to research question 3.2. The data from Figure 6.26 provides the categories and the percentage frequency that demonstrates the findings and how it was supported. It was observed that 33% of the participants disagreed that the current HRIS does help deliver employee work performance results which could indicate the lack of seriousness from the authorities. 52% of the participants indicated their disagreement that the current HRIS assist the public health sector in identifying available positions and placing people in the correct positions, which could signify the lack of support for the use of HRIS to improve workers' confidence at work. Also, a disagreement of 28% is evident that the HRIS could assist in cost management policies regarding budgets of health workforce salaries in the public health sector. HRIS is supposed to help forecast the budgets of workers' salaries, but it is not helpful in that aspect.

The interaction of HRIS with other IS in the health sector showed 33% disagreement; the system is not upgraded to interrelate with other systems. Another issue that affects the benefits of HRIS is that 50% of the participants gave a negative response, indicating that the

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public health sector does not have future expectations of better use of the HRIS than at present. At the same time, 46% indicated that they are not satisfied with the current system and would recommend an alternative system to improve health workforce management. The fact that 33% of the participants gave a positive indication that there are policies in place to support an effective HRIS, but such policies do not make any changes in the use of the system. There was a positive response of 61% to the statement that an effective HRIS can benefit the health sector, but at the moment, the current system is not beneficial to the health sector and would require something to be done about it.

HRIS usage benefit the public health sector for service delivery

Other benefits of effective use of HRIS
- 15%
- 5%
- 80%

Future expectation of effective HRIS
- 10%
- 12%
- 78%

The level of satisfaction of workers with current HRIS
- 7%
- 88%
- 5%

Policies in place for effective HRIS
- 44%
- 17%
- 39%

HRIS interaction with other information systems in the public health sector
- 37%
- 41%
- 22%

0%   20%   40%   60%   80%   100%

NOTE: (i) No idea, (ii) No, (iii) Yes

Figure 6.27: Qualitative frequency diagram of benefits that accrue in the effective use of HRIS in the public health sector

6.4.3.2.2 Qualitative data analysis of benefits that accrue in the effective use of HRIS in the public health sector

The categories were collected for the sub-research question items linked to research question 3.2. The data from Figure 6.27 provides the categories as well as the percentage frequency that demonstrates the strength of response and how it was supported. Figure 6.28 shows the summary of the findings and the analysis provided in qualitative format.

6.4.3.2.2.1 HRIS is useful in the communication of employee and organisational performance results in the public health sector

The category - *HRIS is useful in communicating employee performance results in public health* was created to capture the knowledge of the participants concerning employee performance results using HRIS. Figure 6.26 indicates that some of the participants were unaware of the answer to the question, and 30% agreed about the existence of communication in relation to performance results. 33% of the participants disagreed that the HRIS is used to communicate with the authorities on employee performance results in the public health sector. Employees' performance results are derived from PERMIS, unrelated to HRIS. Also, that employee's performance cannot be derived from the HRIS, which negatively impacts the organisational performance using HRIS.

6.4.3.2.2.2 HRIS interaction with other information systems in public health

This category was created to capture the knowledge of the participants concerning HRIS interaction with other systems. As shown in Figure 6.27, 22% agreed, 37% of the participants were not aware of the answer to the question and the evidence was that 41% of the participants expressed their disagreement that there is a systematic interaction between HRIS and other ISs in the health sector. Respondent MI02 stated that "they are not sure if PERSAL is linked with other ISs, but there is a relationship with the Home Affairs (HA)". Respondents MI04, MI03, MI06 and RI04 are also of the opinion that PERSAL could be linked to the South African Revenue Service (SARS), Magtap (for SANLAM insurance policies) and Basic Accounting System (BAS) for the finance department, but they are not sure how it worked because the system was not upgraded to the latest technology.

However, respondents DI02 and EI04 did not agree on any interaction between PERSAL and other ISs such as: Clinicom, Tier.Net, PACIS, Single Patient Viewer (SPV) and Electronic Client Clinical Record (ECCR). Respondents RI02, RI03, RI06, and RI09 also emphasised that they did not have computers, but the HR functions were done manually, and documents were sent away to another hospital to get captured, and they did not identify IS interactions.

This shows that the PERSAL does not interrelate/link with other ISs in the public health sector because it is not upgraded to the latest technology. Most functions are still manually inclined to support the HRIS in the industry. Some of the participants argued that there are relationships between HRD and departments such as Home Affairs (HA), professional bodies and Finance, amongst others. Still, there is no justification for the lack of technological interoperability between HRIS (PERSAL) and the IS used by those other departments, which warrants a better IS to achieve.

6.4.3.2.2.3 HRIS assist in cost management (budget) in the public health sector

The category - *HRIS helps in cost management policies of hospitals* was created to capture the knowledge of the participants regarding the assessment of the health workforce budgets using HRIS. In Figure 6.26, most of the participants were not familiar with the answer to the question, and 15% disagreed. Most of the participants did not respond, and some opposed it because of their unfamiliarity with the system. This might be due to a lack of knowledge and education about HRIS in the health system. 28% of the participants agreed that the HRIS could assist the health sector's cost management policies and budgets. This will require future investigation to create better ideas and knowledge on HRIS.

The indication that the salaries of the permanent skilled health workforce go through the HRIS could indicate the planned budget for permanent skilled health workforce salaries can be derived from the information in the HRIS. Still, it is not clear if it does.

6.4.3.2.2.4 Policies in place for effective use of HRIS in the public health sector

This category was created to capture the idea of the participants concerning policies in place for the use of HRIS for the effective health sector. In Figure 6.27, 17% disagreed that there were policies for effective HRIS, and 37% of the participants agreed that policies were in place. However, 44% of the participants were not familiar with the HRIS and could not identify policies in place to use HRIS in the public health sector.

Respondents MI04, RI05 and RI14 made it known that there were policies whereby no one was allowed to leave the HRIS (PERSAL) computer system open on their desk or they would be disciplined. Further, no worker's personal information could be released outside the HRD even to the banks without the person involved being first notified.

Respondents EI04, EI11, and RI03 were also of the view that people in the HRD sign a consent agreement that if they capture wrong information on the system, they will be held liable. They also have policies where people are given a cut-off date and time to submit their leave and other HR-related documents for capturing on PERSAL.

Respondents MI01, MI02 and MI03 also stated that on the public health sector website they could browse through the blue pages to access the PERSAL handbook known as the System Operating Booklet (SOB) on how to make use of PERSAL before they could have access.

This indicates that the public health sector has several policies in place for the effective use of HRIS, where the users sign a consent agreement not to disclose any HR information and would also be held liable for capturing wrong information. Users could also be disciplined for leaving the system open and unattended. However, most of the participants were not familiar with the policies. The fact that they had cut-off dates for submitting documents manually also impacted the workers' performance and service delivery.

6.4.3.2.2.5 Satisfied with current HRIS (PERSAL) in public health sector

This category sought to capture the knowledge of the participants concerning their satisfaction level with the system. As indicated in Figure 6.27, 7% of the participants did not respond to the question, while 5% agreed they were satisfied with the system. 88% of the participants were not satisfied with the HRIS used in the public health sector. Respondent RI15 mentioned that:

> The current HRIS (PERSAL) is primitive. They need an upgraded system that can connect with PERMIS and other IS, allowing self-service and producing time and accurate information for effective health workforce satisfaction.

Respondent DI01 is of the opinion that:

> Things need to be done better like time and attendance can be automated than having a big book register at the entrance door in their facilities, and the transition from paper-based to computer base is necessary.

Respondent EI04 indicated that "some things are supposed to be done by managers/workers on MSS/ESS, but most do not have access to a computer and ISs in most public hospitals". Respondents MI02 and MI08 also highlighted that the government needs to upgrade the HRIS to allow everyone to have access using their unique (PERSAL) number to conduct their basic information transactions and relieve the burden on the HRD.

Respondents MI01 and EI11 emphasised their need to be completely paperless and to allow workers to upload information on the system while HR could then do follow-ups. Respondents RI01, RI02 and RI13 also mentioned the need for a better HRIS because the present system was not efficient.

There was a high level of dissatisfaction with the current HRIS among the participants because they were not allowed access to capture their leave and other HR-related information on the system. Also, there was a high level of the paper-based system to supplement the HRIS. The fact that some other participants did not comment on the question was also an indication of high dissatisfaction with the system. Some of the participants did agree because

they were not interested in having other functions added to their current work schedule, which boils down to resistance to change in the use of the system.

6.4.3.2.2.6 Acquire a new HRIS for effective performance in public health sector

This category was created to understand the knowledge of the participants concerning effective HRIS in the public health sector. Figure 6.26 indicates that 30% of the participants disagreed with acquiring an alternative system; they preferred the current system to be upgraded to the latest technology. 46% of the participants agreed that they should acquire an alternative system to replace the existing one.

Respondents EI01, EI06, EI07, EI12, MI09, EI03, DI04 MI06, DI06 and EI09 were not satisfied with the PERSAL system. The government should acquire a new HRIS that all the skilled health workers could use to communicate with the HR and be in line with the latest technology, rather than taking longer to process HR-related queries.

Respondent RI04 also complained that:

> At the facility level, they perform HR functions without HR and HRIS skills and will prefer to have a sophisticated HRIS to do their HR work themselves instead of travelling to the substructure to submit the HR documents and deal with queries.

The indication is that the skilled health personnel prefer the acquisition of an alternative HRIS that would represent more recent technology that they could use to communicate with authorities instead of using the manual system and travelling to substructures to deal with their HR queries. Also, the response to upgrading the existing system indicates that the workers need a new structure in HRIS to eliminate manual, outdated systems in the HR function.

The responses to 6.4.3.2.2.5 and 6.4.3.2.2.6 show that the workers are not happy with the current HRIS and prefer an alternative system with the latest technology for effective skilled workforce sustainability.

6.4.3.2.2.7 Future expectations of the use of HRIS in public health sector

The category - *Future expectations of the public health sector regarding effective use of HRIS* was created to capture the knowledge of the participants concerning the statement. In Figure 6.27, it is evident that 78% of the participants agreed that there were future expectations of the use of effective HRIS, but the current HRIS did not assist in achieving that.

Respondents EI01, EI06, DI04, RI03, RI14, EI03, and MI09 indicated that currently they do not have effective HRIS, but there is a need to have a better system for quick responses to information and to have computers and ISs to communicate with the HRD. Respondents RI02, RI15, and DI02 were also in favour of moving towards a paperless system by having a digitalised system with a more efficient working environment where they could extract any information from the system.

Respondents EI13 and MI08 also emphasised that IS was here to stay, so they needed to advance to the latest technology by implementing a sophisticated HRIS that would allow the workers to interact with HRD through the system.

However, respondents DI01 and RI13 mentioned that they would expect more consistency to be reached with all the facilities; it was a long-term goal because there were different resources in different facilities, and they needed more training and consistency in the sector. Respondent MI03 also expressed

> the need to work in a paperless environment, like in the mortuary section where I use to work before, they make use of PERSAL and other ISs to apply for leave, and allowances and sign electronically without going to HRD. Electronic Content Management (ECM) for HR archives and platforms for inquiries are also relevant.

Also, respondent EI10 maintained that:

> If they can have HRIS that everyone can have access to in all the provinces, allow people to apply for transfers and promotions without resigning and reapplying all over and conduct recruitment through the same IS, will be a great achievement".

Respondents RI01 and RI08 also indicated that if everything was electronic, it would cut down on unnecessary delays where they could have immediate access and feedback; they would not have to run from one person to another. They were also conditioned not to complain about their superiors, and they also had to accept things, which is why people were unhappy at work.

Based on the respondents above comments, the current HRIS (PERSAL) cannot assist the public health sector to comply with future expectations. Still, with regards to a new system, they believe in achieving future expectations regarding effective HRIS in the public health sector if the system was sophisticated and incorporated the latest technology. Also, moving towards a paperless system would make functionalities more complex and less complicated, allow workers access to capture their leave allowance, and sign documents electronically. It should also be a system through which applicants could apply for a job and get a response, identify promotions, and transfer and implement them through the system, and use ECM for HR archives and as a platform for enquires through the HRIS.

6.4.3.2.2.8 Other identified benefits for effective HRIS usage in public health sector

The category – other benefits of using HRIS was created to capture the knowledge of the participants regarding the benefits of HRIS. In Figure 6.27, it is evident that 80% of the participants gave a positive response that the health sector can benefit from the effective use of an HRIS, to which the current HRIS (PERSAL) is not contributing.

Respondents RI15 and EI10 mentioned that PERSAL is not beneficial to the sector and recruiting the right people for the job could streamline the HRD functions through an effective system to find out why people are resigning and ways to improve the retention of the workforce. There are money issues, interoperability issues, and interpersonal issues, which a new system will assist in identifying the gaps in the sector. The new system will also assist in filling those gaps, which will be an achievement of new the sophisticated HRIS.

Respondent DI02 maintained that "a new HRIS will assist in the management of staff, performance management, time management, sick leave, staff access to their profile. With this process, HR does not have to capture everything because of self-service usage".

Respondent MI03 also noted that "It would be easier for non-employees to access the HRIS besides the support function of HR, for the recruitment and selection online system where people can apply and get feedback on the system if they are successful or not and for what reason". Respondent MI01 is in line with respondent MI03 who "indicated that the new system will make things easier in the HRD where people will be submitting HR documents themselves and approvals will follow suit through self-service, then the HRD will look at the information and review them, then be able to make appropriate remittance immediately".

Respondent MI07 maintained that "this process will eliminate the walking up and down to HRD, also not been able to meet up the stipulated appointment time with HR and allow people enough time to focus on their work without HR-related stress will be a great benefit".

This shows that the current HRIS (PERSAL) is not benefiting the public health sector due to its lack of sophistication. Still, a new, improved system can assist in making things much easier and eliminate many manual processes and frequent visits to the substructure.

6.4.3.2.3 Summary of benefits that accrue in the use of HRIS in the public health sector

Based on sub-section (6.4.3.2.2) analysis, a summary of benefits that accrue in the use of HRIS in the health sector is provided in Figure 6.28:
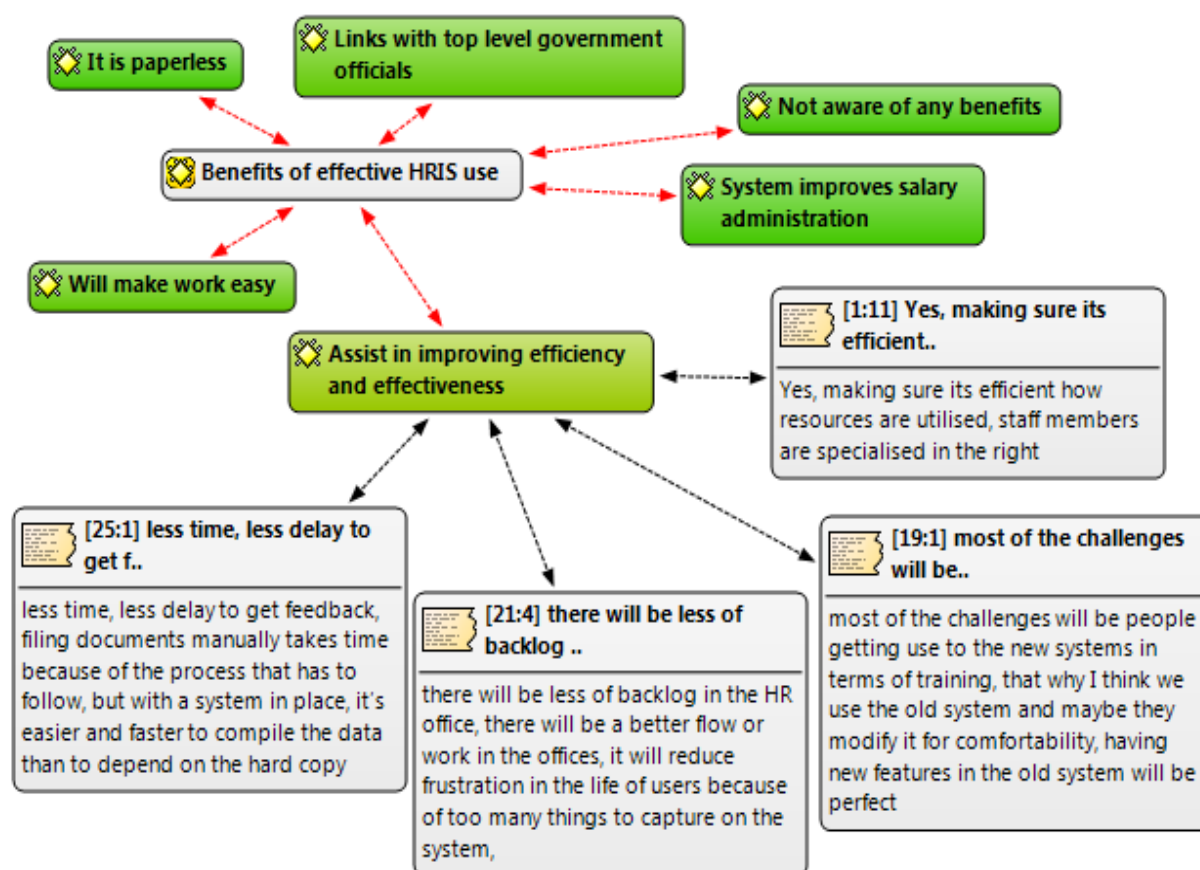
Figure 6.28: Summary of benefits that accrue in the use of an effective HRIS in public health

In Figure 6.28, the qualitative data analysed in the study provided a significant indication of the benefits of HRIS in the public health sector. These included most notably its contribution to the efficiency and effectiveness of health service work. An HRIS can effectively link with top-level government officials as it cuts bureaucratic hierarchies. Respondents also recognized the paperless nature of HRIS, making the job of the HRD easier. Despite these notable benefits, other respondents indicated a lack of awareness of any benefits of using current HRIS (PERSAL).

6.4.3.2.4   Strategies achieved with the current HRIS (PERSAL) in public health sector

Questions relating to strategies using the HRIS were created to capture the knowledge of the participants, and their response is provided in Figure 6.29 as follows.
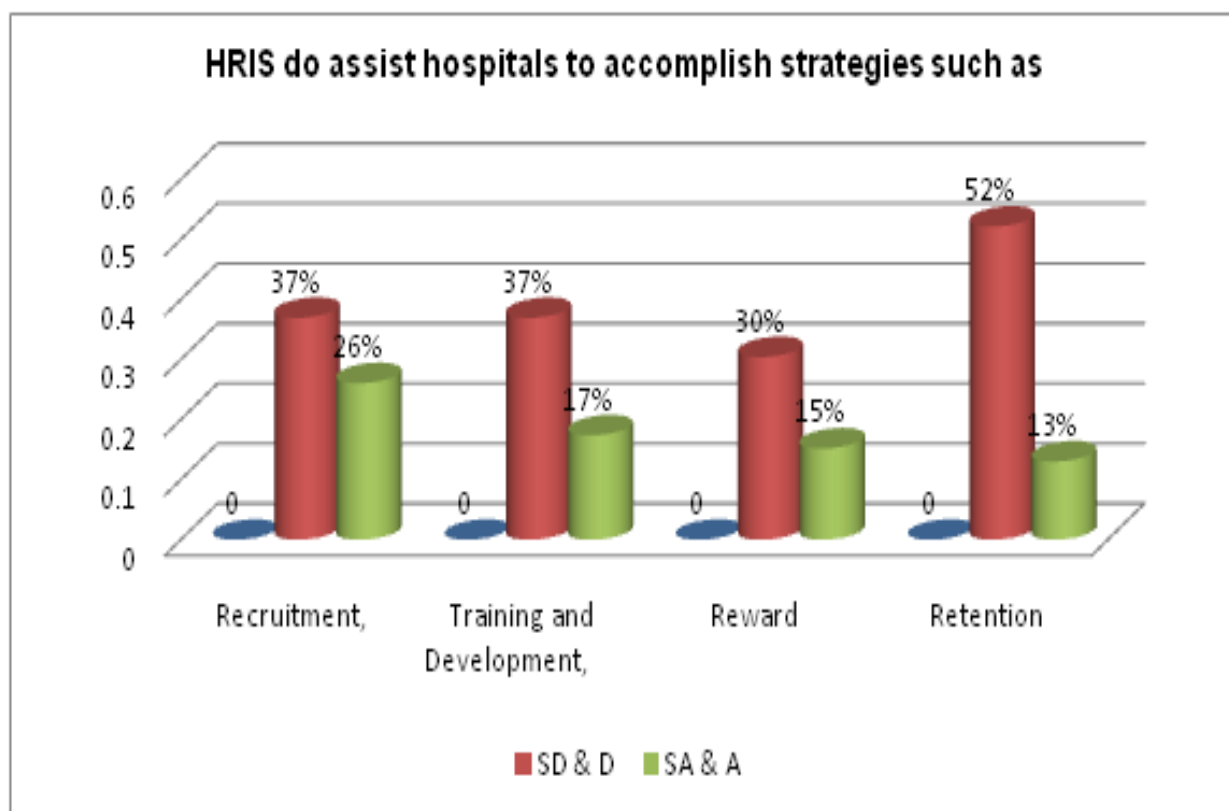
Figure 6.29: Frequency diagram of benefits that accrue in the effective use of HRIS in the public health sector

6.4.3.2.4.1 Recruitment strategy

Figure 6.29 showed that 26% agreed on the achievement of recruitment strategy because they believed they could affect recruitment through placing adverts on the internet, although not linked to HRIS. 37% disagreed with the accomplishment of recruitment strategies in the use of HRIS (PERSAL) in the public health sector, which was characterised by manual intervention to conduct recruitment and not through the HRIS.

6.4.3.2.4.2 Training strategy

Training strategy was also in the spotlight in Figure 6.29, with 17% agreeing that training is conducted through the HRIS because, after training, the training outcome is captured on the

PERSAL system for record purposes. 37% of the participants disagreed with the accomplishment of training strategies because training is not conducted through the HRIS and the fact that people had to apply to be trained, instead of the HRIS assisting the public health sector in identifying people who are due for training.

6.4.3.2.4.3 Reward strategies

Reward strategies were also tested in Figure 6.29; 15% agreed that reward strategies were achieved because they received their salaries even though sometimes there were errors and omissions. 30% of the participants disagreed that HRIS does assist in recognising hard workers to be rewarded for their extra effort. HRIS is used just for essential administrative payroll functions and not to assist in identifying those who should be rewarded for going the extra mile in performing their duties.

6.4.3.2.4.4 Retention strategy

Retention strategy was also in the spotlight in Figure 6.29; 13% agreed on the use of HRIS to achieve retention because they are not familiar with the HRIS and how such a system can assist with retention. It is evidence that 52% of the participants disagreed that the current HRIS (PERSAL) motivates skilled workers to be retained at work. Retention goes with better ISs, better technology, and better pay, unlike the current HRIS.

6.5   CHAPTER SUMMARY

In summary, (Tables 6.3 - 6.5) provide an overview of the analysis of the findings done in the chapter in terms of the research questions and sub-research questions formulated in chapter one.

6.5.1   Summary of the findings concerning the research questions

Tables (6.3 – 6.5) shows the summary of the results according to the research questions

Table 6.3: Summary of findings concerning research question 1

Research question and sub-research questions	Findings	The emerging theme for further study
RQ1. **What factors hinder the effective utilisation of HRIS within the health sector of South Africa?**	HR in the public health sector appears purely technical and lacks a strategic thrust. As a result, there was evidence that it was poorly structured. The reasons for the poor utilisation seemed to be centred on poor commitment to have a broad well-structured HRIS system, as well as a poor appreciation of the positive impacts of HRIS in the public health sector.	HRIS change management challenges in public health institutions.
SRQ1.1. What are the reasons for the ineffective utilisation of HRIS in the health sector?	- Workers know HRIS and what it is used for but have no access - Lack of cognizance among workers of HRIS - Lack of fully-fledged HRD with no HRIS; HR is manual in hospitals and documents are sent to substructure to capture in HRIS - Lack of security of HR documents in facilities without HRIS/HRD, documents stored in a filing cabinet - Current HRIS does not enhance the HR functionality, not upgraded - The size of a hospital does have an impact on HRIS effectiveness	
SRQ1.2. How does HRIS impact the performance of the health sector?	- Capture, record-keeping, and retrieval are not effective; no access to computers, and to IS - HRIS functions are much more manually inclined than via IT in the public health sector - No special incentives to support the use of HRIS - No teamwork because not everyone has access to HRIS - There is no confidentiality in the hospitals where they employ casuals to perform HR functions manually on employees' details	

Table 6.4: Summary of findings concerning research question 2

Research question and sub-research questions	Findings	The emerging theme for further study
RQ2. **What impact does HRIS usage have on monitoring and retaining the skilled workforce in the health sector?**	Despite indications from the study that HRIS is likely to impact HR management positively in general, there was evidence that HRIS is not meeting expectations. There were indications that many health workers lack full awareness of how HRIS is being managed or implemented in the public health sector and how the system can assist in retaining the health workers	Impact of HRIS and its acceptability assists in retaining workers in the public sector organisations.

Research question and sub-research questions	Findings	The emerging theme for further study
SRQ2.1. How can HRIS be used to manage health sector workers?	• No functionality in HRIS to communicate with HRD and management, only manual contact, phone, email • HRIS (PERSAL) has never been upgraded since its acquisition. Primitive and very old • There is a column in PERSAL to capture reasons for resignation, but not effective, an exit interview is not useful • Training on HRIS usage is once off when employed to work on HRD and on the system because the system is not upgraded regularly for more training to be conducted • Not all employees have access, no use of self-service, nor the latest technology • HRIS (PERSAL) does not assist in identifying skills development (training) opportunities, people apply for training • PERSAL captures details of only permanent staff with PERSAL numbers, not all workers.	
	• (i) Payroll in PERSAL, (ii) time and attendance; (manually) and not in PERSAL, (iii) benefits administration; only basic information is captured on PERSAL, (iv) HR MIS; not in PERSAL and not in use (v) Recruiting and learning: only basic information is captured on PERSAL, (vi) self-service: not in PERSAL and not in use, (vii) performance record: done on PERMIS and not linked to PERSAL, (viii) absence management: (manually) only basic information captured on PERSAL (ix) scheduling: (manually) and not on PERSAL, (x) analytics: not on PERSAL and not in use (i) Personnel management, (ii) labour relations, (iii) disciplinary, (iv) salaries and leave allowance and (v) deductions.	
SRQ2.2. How does HRIS assist the health sector in encouraging skilled workforce retention?	• HRIS does not identify skills gaps in the health sector, not strategic • Lack of adequate infrastructure to facilitate HRIS • HRIS (PERSAL) does not interrelate between professional bodies and the health department • HRIS does not keep a record of all workers, professional bodies keep only registered members' information • HRIS does not assist to decide on salary adjustments and benefits in the health sector • No IS to interact or make complaints and queries, done manually • HRIS does not assist to monitor and manage workers, not upgraded and sophisticated • Not all employees have access, only certain people in HR and one person in Finance.	

Table 6.5: Summary of findings in relation to research question 3

Research question and sub-research questions	Findings	The emerging theme for further study
RQ3. **How can HRIS be utilised to assist the health sector in improving its services to the public?**	Despite recognition that HRIS is likely to enrich the implementation of various HR functions such as payroll, performance appraisal, labour relations and grievance management, there were notable indications that support initiatives are required from the government. These include financial and infrastructural support as well as training and development initiatives.	HRIS empowerment, government support as well as employee motivation to use HRIS in the public health sector.

Research question and sub-research questions	Findings	The emerging theme for further study
SRQ3.1. How can the government support the use of HRIS to improve service delivery in the health sector?	• The government does not put-up requirements to regulate the use of HRIS in health. • Lack of adequate budget to support HRIS. • Lack of effective government support for the use of HRIS for service delivery • HRIS is not contributing to the NDHSA efficiency, and the system is DOS, not biometric, with no use of a mouse pad. • HRIS is not used to monitor the mobile unit; monitored manually by line managers in book records. • HRIS does not assist in leveraging talent in the right place. PERSAL is administrative only. • HRIS does not assist in determining promotion and transfers. People apply for it. • They have DD in HR, but not sure they make use of HRIS. • SA lags in retaining health workers. No effective HRIS to retain workers.	
SRQ3.2. What benefits could accrue in the effective use of HRIS in the health sector?	• HRIS is not used for performance records. PERMIS is used and not interoperable with HRIS. • HRIS does not assist in analysing job titles, positions, and placements. It is done manually. • HRIS does not interrelate with other ISs in the public health sector. Not sophisticated. • HRIS assists in forecasting the budget for permanent skilled health workforce pay, but not all the workers. • The users have policies in place to use HRIS, with a consent agreement signed, but the policy of not allowing everyone access is a challenge. • Not satisfied with current HRIS, used for basic pay, not competitive with developed countries. • Acquire an alternative HRIS with the latest technology. Worker's access to interact with management and HRD through the system. • New HRIS for future expectations, workers, can have access to make complaints on what needs to be done to retain them in the public health sector.	
	• Recruitment, training, reward, and retention strategies are not accomplished because the HRIS (PERSAL) is not sophisticated, and most HR functions are done manually.	

6.5.2   Categories of transcribed data

The keywords of grouping and categorising the transcribed data as described in Chapter Five, and applied to the interview data transcript, generated a set of 12 categories (Table 6.6). The data categorisation was done by grouping keywords and phrases with similar meanings together and placing them into complementary categories according to research questions and sub-research questions (Appendix L). It is recognised that some level of prejudice could be apparent in the frequency in the use of some keywords and phrases and the number of occurrences of the keyword(s). Some of the interviewed participants provided a summary of the answers using specific keywords that were part of the questions asked in the interviews.

Table 6.6: Identified keywords/themes for discussion in the next chapter

S/NO	Identified keywords/themes for discussion
1	Primitive system
2	Manual intervention
3	Basics administration of information
4	Access to computers and other devices
5	Availability of funds/budget
6	Infrastructural challenges
7	Centralised system
8	Sophistication of information system
9	Timelessness of information
10	Substructural challenges
11	Confidentiality of information
12	Resistance of change

6.5.3   Summary

This chapter has provided insights into the technological context of the public health sector. It has reviewed some psychosocial as well as political and economic imperatives affecting technological utilisation in the selected hospitals. The data collected was considered in relation to the research questions developed for the study. In particular, the study:

- Found evidence that there is limited knowledge of HRIS in the public health sector of SA.

- Established that most respondents equated HRIS to PERSAL, which is a narrow view of the ISs available for HR in the Fourth Industrial Revolution (4IR) that we are currently in.

- Found that there is a rigid hierarchical HR function in the public health sector that could lack the flexibility and responsiveness that might be important for effective utilisation of HRIS

- Was inconclusive on respondents' perceptions regarding the security of data captured in HRIS, with most respondents viewing security in terms of unique passwords. Knowledge of cybersecurity issues that include hacking and other cyber-attacks was not evident among the respondents.

- Noted that there is inadequate awareness of how HRIS promoted effective HR functionality of the entire HR function

- Found evidence that government commitment to improve the utilisation of HRIS was also limited

- Observed several benefits of utilising HRIS were evident among the respondents. It was clear that many respondents did not believe that the current HRIS (PERSAL) could result in improved performance and retention in the public health sector.

The next chapter will discuss findings according to the themes identified in this chapter in Tables 6.3, 6.4 and 6.5, based on the research questions and identified keywords in Table 6.6.

CHAPTER SEVEN: DISCUSSION OF FINDINGS

Chapter seven – DISCUSSION OF FINDINGS
Introduction
Discussions according to research questions
Identified keywords/themes for discussion
Justification of research findings
The framework for the study
Chapter summary
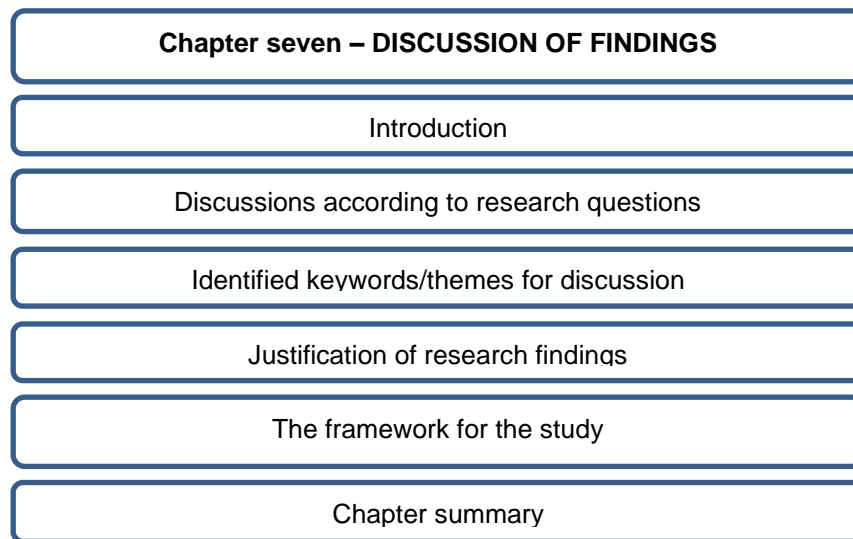
Figure 7.1: Layout of Chapter 7

7.1 INTRODUCTION

The findings outlined in Chapter Six are discussed in this chapter in comparison to previous research studies. In order words, it suggests triangulation of the interpretations of the findings from interviews and questionnaires with prior literatures for better understanding of the phenomenon.

This study aimed to explore and understand the use of the HRIS as well as factors that prevent the effective use of such information systems in the public health sector of SA. An exploratory and descriptive study was followed to gain a deeper understanding of the previously identified obstacles and other reasons that affect the effectiveness of HRIS in the public health sector. The result aims to propose a guideline and framework to guide the effective utilisation of HRIS in the public health sector for workforce retention and sustainability strategy in a complex healthcare environment.

Several keywords/themes emerged from the findings discussed below in this chapter. The table in Appendix L shows the keywords/themes as they emerged from the sub-research and research questions.

In this chapter, the discussion of the findings is arranged and presented according to the order of research questions, identified keywords, and then followed by a framework from the study

7.2   DISCUSSIONS ACCORDING TO RESEARCH QUESTIONS

7.2.1   RQ1: What factors hinder the effective utilisation of HRIS within the health sector of South Africa?

To reiterate, the first research question for the study was research question 1: What factors hinder the effective utilisation of HRIS within the health sector? This discussion combined the findings from sub-research question 1.1 (What are the reasons for the ineffective utilisation of HRIS in the health sector?) and sub-research question 1.2 (How does HRIS impact the performance of the health sector?). These 2 sub-research questions (SRQ1.1 & 1.2) provide answers to the research question (RQ1).

7.2.1.1   SRQ1.1: What are the reasons for the ineffective utilisation of HRIS in the health sector?

Literature has established numerous reasons for the ineffective use of HRIS over the years from the perspective of enterprises, businesses, and organisations (Mahlulo, 2020). The findings from this study align in many ways with current literature as follows.

7.2.1.1.1   Knowledge and awareness

In Figure 6.9, the health workers' awareness, and knowledge of HRIS were an issue where 41.5% of the interviewed participants were not aware of the existence of HRIS because they were not familiar with the HRD activities, and they did not have access to the system. Dilu et al. (2017:1) found that the readiness for the HRIS implementation was low, which means that the strategies targeted to improve the awareness and attitude of the skilled workforce to facilitate the process were untrustworthy and unreliable. This suggests that the awareness and knowledge of HRIS in the public health sector are not consistent across the entire health sector.

In addition to the awareness and knowledge, Figure 6.9 highlights the participants' attitude towards PERSAL. 63.4% of the interviewed participants argued that even though they were not aware of HRIS, ideally, they knew that the HRD used PERSAL to capture their HR-related information and would expect further knowledge and education on HRIS, and its usefulness to the entire workforce. This corresponds with the 52% response from the quantitative analysis in

Figure 6.8, where they also agreed that they had knowledge of PERSAL used in the public health sector.

Respondents RI01, RI02 and RI09 indicated that they did not have an idea of HRIS, but as far as they knew, their leave papers were sent off to another office in Tokai (substructure) and were captured in PERSAL in the HRD (Appendix N of transcription).

This study supports the argument of Kitson (2019) regarding the use of experimental and incremental approaches. These approaches suggest proper monitoring and evaluation of HRIS in the health sector to restructure and improve the health workers' forum, followed by measures to increase the knowledge and awareness of HRIS usage among the workers for effective health services.

7.2.1.1.2 *Existence of HRD and HRIS*

In Zongjun's (2019) study on the factors affecting employees' productivity in organisational development, lack of effective HRD was identified as the primary deterrent to the existence and progress of organisations. The HRD and HRIS in the various public hospitals were also a reason identified by 46% of the interviewed participants in Figure 6.9, who indicated that most public hospitals did not have a fully-fledged HRD and did not make use of HRIS. This corresponds with the 48% of the participants who disagreed with the existence of HRD and HRIS in their hospitals, as shown in Figure 6.8. 7.3% of the participants in Figure 6.9 and 39% of the participants (Figure 6.8) responded positively because the hospitals used one person who dealt with all the HR functions and documentation. However, the person might not have had the skills, knowledge, and expertise to handle the HR functions effectively. The authorities had to categorise the hospitals and apportion them into substructure levels to deal with their HR, finance, and other functions due to their size and level of operation.

Respondents DI02 and DI03 noted that most public hospitals had an HR person who did the HR work manually. However, Cape Metro is divided into 4 substructures according to the geographical area. Each substructure has an HR and finance department which all the facilities/hospitals/clinics in that area fall under. This argument corresponds with that of Maduagwu and Ugwu (2018), who recommended that effective HRIS can assist in contributing to the enhancement of productivity among workers if they are allowed to acquaint themselves with the system. Also, need to have an HRD with skilled HR workers to deal with workers' details for better focus on their job.

7.2.1.1.3   *Security of information*

Lack of data security is a reason for the ineffective use of HRIS. In this study, 51.3% (29.3% and 22%) of the interviewed participants (see Figure 6.9) affirmed the existence of security in using HRIS, where they use a unique PERSAL password to access the system. Also, there were lines of authorisation of documents captured as part of the security in place and consent documents signed by the users as security modalities. This corresponds with the 44% optimistic respondents shown in the quantitative analysis in Figure 6.8 regarding the existence of security in HRIS. Respondent MI03 believed that "they do have information security to safeguard the HRIS because the PERSAL system has a secure login pin, for access to screen1 and screen2 to allow access to the components that they are assigned to". Respondent MI01 supported the latter of the opinion that "there are lines of approvals and authorisations that must be followed".

This argument is consistent with Spero et al. (2011:3), who state that to strengthen the health sector using the HRIS, there must be data quality and security of HRIS enhanced ICT infrastructure, HRIS software solutions must be developed, an HRIS capacity to sustain the sector must be built up.

Thus, respondent RI15's comment that "there are challenges where there are security breaches where unauthorised people/union have the authority to request for deductions from employees' salaries without consulting the people involved is not appropriate". Some of the participants (29.3%) have doubts about the existing security of information in the HRIS. The doubts arise because union executives have the authority to forcefully access other people's details and make deductions from their salaries without consent. This security breach demoralises the people involved and can make someone resign. This also supports the 17% of the participants in Figure 6.8 (quantitative) that disagreed that there was effective security.

7.2.1.2   SRQ1.2: How does HRIS impact the performance of the health sector?

Discussions on the findings were linked with literature concerning the questions asked in this study to have an idea of knowledge about the impact of HRIS performance with regards to the health workforce.

7.2.1.2.1   *Record and retrieval of information*

HRIS usage in capturing, recording, and retrieval of information impacts the health sector's performance. In Figure 6.13, 51.2% of the interviewed participants showed effective capturing

and recording. Still, information retrieval is not as expected due to network overload, where too many people working on the system simultaneously delays the reports generated. Also, 46% of the participants in Figure 6.12 (quantitative analysis) positively responded to effective record and retrieval of information in HRIS. Matimbwa and Masue (2019:132) contend that lack of internet/network, low computer memory storage, lack of continuous data backup, no antivirus usage and load shedding are significant technical challenges that affect the capture and retrieval in HRIS. Respondent MI04 reiterated that "capturing and recording of information in HRIS might not be a problem, but when there are too many people in the system at a time can slow the process, which is a major problem".

This study is in line with Kavanagh et al. (2015), who proposed the introduction of a system development plan that could be used to align workers and organisational needs through the strategic use of HRIS for effective data retrieval and health workforce decisions.

Further to records and retrieval, 33% of the participants in Figure 6.12 of the quantitative analysis disagreed that there was effective capturing and recording of information. This supports the argument of some of the interviewed participants in Figure 6.13 that capturing, recording and retrieval of information are not effective. Reasons for this ineffectiveness include not being comfortable with using a computer (4.9%), poor computer skills (14.6%), ineffective capturing and recording (14.6%), and lack of knowledge of capturing and recording (19.5%). Respondent MI07 emphasize that "capturing is not effective because since they started working in that hospital [9 months ago]; their salary has not been upgraded till date". Respondents EI10 and RI10 also could understand why the HRD could not retain the very same document that they had to resubmit every year which requires some attention.

This argument corresponds with David et al. (2015:116) that HRIS usage can assist organisations in recording and analysing employees' documents and information, such as employees' personal and qualification documents, and keeping accurate information that can be easily retrieved whenever it is needed. For effective performance of these duties, the benefits need to be singled out, which is yet to be accomplished in the hospitals under study.

7.2.1.2.2   *Improving performance of workers*

The use of HRIS to improve performance over the manual HR system was more evident. 46.3% of the interviewed participants in Figure 6.13 mentioned that the current HRIS (PERSAL) was much better than the manual system but needed improvement. Also, the fact that the system was not assisting in identifying why people resigned negatively impacted performance in the health sector. 24% positive response from the quantitative analysis in

Figure 6.12 supported that the current HRIS is much better than the manual system but needs to be upgraded. According to Respondent RI15, "HRIS could assist in identifying statistics of demographics, gaps within the sector, shortage of medical, nursing personnel, capture leave, but cannot identify reasons why people are resigning".

This argument is in line with Matimbwa and Masue (2019), who mentioned that management fails to furnish HRD with information about employees on time, which impacts the performance of effective system usage. They expect a system to capture information about the employees who are being transferred, promoted, and removed from the payroll, disciplinary action, and data cleaning. Bandyopadhyay, Chowdhury and Hazra (2012) are also of the opinion that an effective HRIS can assist in structuring an organisation's location, department, designation, employee group, resignations, terminations, transfer and promotion for effective performance.

However, 19.5% of the interviewed participants (Figure 6.13) argued that some facilities were not using HRIS. The fact that the system was ineffective because documents could go missing in transit could be devastating. This is in line with the response of 50% of the participants as depicted in Figure 6.12 of the quantitative analysis group that disagreed that the current HRIS assists to improve the health sector. They need a new system for improvement purposes. Respondent EI13 remarked that "ineffective HRIS does affect their performance because sometimes they appoint someone newly to start work and their HR documents get missing, which ultimately affects their performance at work". Also, Respondents DI04 and RI11 believe that the lack of effective HRIS has negatively affected their work because they had to leave their work and focus on solving HR and missing document problems.

This study corresponds with Scott et al. (2015), who indicated that the HRISs used to capture leave records in some organisations were unreliable. The outstanding leave days and entitlements requested by the management were found not to be updated, not captured, or lost in transit and therefore untrustworthy. Marutha (2011) maintained that poor record-keeping caused by lost documents could lead to delays in services rendered due to a high level of paperwork, no proper filing system, poor planning, poor supervision and lack of experienced officials.

7.2.1.2.3   *Incentives to users*

The focus was on the impact of incentives to the users of HRIS for performance in the health sector. In Figure 6.13, 85.4% of those interviewed did not know of special incentives for access to HRIS. This corresponds with the 48% response from the quantitative analysis (Figure 6.12), where they disagreed that there were incentives given to HRIS users. The lack

of incentives is unfavourable as it demoralises the workers, leading to their not having an interest in accessing the system.

Respondents EI01 and EI06 stated that they did not have any idea of specific incentives for the HRIS users and that everyone was expected to be paid annual incentives from the authorities through PERMIS for performance appraisals. Respondents RI15, MI08 and RI08 argued that hospital policy did not allow everyone to be incentivised. But every department had several people chosen to be incentivised.

This supports the argument in Phahlane's (2017) and Okolo and Iruo's (2021) studies. They recommend that the conditions of service in the use of HRIS need to be improved through special incentives to support access to the system. Padarath et al. (2003) and Kumler et al. (2013) are also of the view that workers need to be accurately incentivised for their efforts to allow them to remain at work at all times.

7.2.1.2.4 External audit on HRIS

Figure 6.13 depicts other reasons that deprive HRIS of effective usage. 2.4% of the participants mentioned the lack of audit on HRIS, but the researcher had to identify the importance of audit on HRIS as critical. Participants mentioned that an audit was only conducted on the reports and documents generated from HRIS and not on the HRIS itself to find out if the system was used effectively. This was a challenge that requires much attention. Respondent MI03 stated that "there is the inability of the health sector to have a third party like an external auditor to audit the PERSAL for them. [This may be] because, currently, the Auditor General only sends people to audit the reports generated from the HRIS and not HRIS itself, which is an issue that requires attention".

This study is in line with Saleem and Akbar (2015) in their focus on the improvement of HR functions and implementation through the alignment of compliance and legal review with strong IS audits in organisations. There is also the need for an effective HRIS audit for workforce records to be implemented to assist in characterising the health workforce control in countries (Esanga et al., 2017; Udekwe et al., 2021a).

7.2.1.2.5 Workload

The workload issue in the HRD is another reason identified by the interviewed participants that limited the effective use of HRIS. High workload affects the working conditions of the HR staff where they are given the task of handling HR information of 200 to 300 workers in a particular

hospital, coupled with other employees in about 20 to 30 more hospitals, which becomes a huge burden that boils down to dissatisfaction in the HRD. There is a perception that the skilled workforce is occupied with a huge workload that deprives them of access to HRIS. In Figure 6.12, 33% of the participants in the quantitative analysis disagreed that there was teamwork, which impacted the high workload in the public health sector as a challenge. Respondent MI08 mentioned that "sometimes HR staff resigns, and their work is apportioned between other workers until they have a replacement, which is the workload on their part".

This study corresponds with Gray (2019:21), who indicated that unhappiness among healthcare workers is an experience caused by poor working conditions, extreme workload, violence, and victimisation in the workplace. Antony and Balu (2018:122) hold that workload is a crucial factor that creates an unsuitable working environment caused by the complexity and complication of IS usage in the health sector.

7.2.2   RQ2: What impact does HRIS usage have on monitoring and retaining the skilled workforce in the health sector?

The second research question for the study was RQ2: What impact does HRIS usage have on monitoring and retention of the skilled workforce in the health sector? This discussion combines the findings from the SRQ2.1 (How can HRIS be used to manage health sector workers?) and SRQ2.2 (How does HRIS assist the health sector in encouraging skilled workforce retention?) Both sub-research questions (SRQ2.1 & 2.2) provide answers to research question (RQ2).

7.2.2.1   SRQ2.1: How can HRIS be used to manage health sector workers?

Discussions of the findings are linked with literature concerning the questions asked in this section to identify the use of HRIS to monitor and manage workers in the public health sector.

7.2.2.1.1   System upgrade

The lack of frequent system upgrades is a major deterrent to the use of HRIS for effective monitoring and management of the workforce in organisations. Several studies have shown that most organisations are not taking information systems such as HRIS upgrades seriously as expected, which negatively affects the retention of the workforce (Monica & Reddy, 2020). In Figure 6.17, 27% of the interviewed participants disagreed that there were regular upgrades of HRIS, while 51% were not aware of upgrades on HRIS. Also, 34.7% of the participants in the quantitative analysis (Figure 6.16) gave a negative answer to the advancement of HRIS.

Could this be an indication that PERSAL has not been upgraded? In fact, this seems to have been affirmed by 22% of the interviewed participants (Figure 6.17) who said that while clinical and other information systems received regular upgrades, PERSAL was yet to be upgraded, hence it remains based on DOS. This is also corroborated by 24% of the quantitative analysis group (Figure 6.16) who confirmed that upgrades were done only in the clinical information systems and not on HRIS.

Can it be argued therefore that the public health sector does not recognise the skilled health workers as critical skills to support their management through improved HRIS? This view resembles those of Gebre-Mariam (2018), who believes that the use of non-internet-based and archaic systems such as a DOS HRIS is not only costly but neglects the importance of a workforce as their roles become more tedious.

7.2.2.1.2   *Workforce training*

In Figure 6.17, 46% of the interviewed participants mentioned that the public health sector does not have broad-based training on HRIS because not everyone has access to HRIS. Also in Figure 6.16, 36.9% of the participants gave a negative response to the training on HRIS being conducted for all workers, which is in line with the responses from the interview. Moreover, training on clinical and other health-related functions is not conducted through the HRIS (PERSAL) due to a lack of support and modernisation of the system. 29% of the interviewed participants (Figure 6.17) and 30% in the quantitative analysis (Figure 6.16) argued that training is a once-off thing that happens once someone is employed to work on PERSAL. Training will only be on the components the HR staff will be working on. Also, the government policy does not allow people to be identified for training. People have to apply personally for training in the public health sector, which is not appropriate. Respondent MI01 mentioned that "training is not in our hospital, but the WCPDHW does conduct training for PERSAL users, but it has been too long overdue because the current system is not modernised for regular training".

Some of the findings from this study correspond with Mwarey et al. (2014) and Nagadeepa and Shaji (2021) who indicate that a high rate of turnover and retention challenges are caused by defects of IS usage for salary issues, training and career development opportunities. The lack of HR systems to implement the training skills to empower the workers affects their retention ability.

7.2.2.1.3 Details of all employees

In Figure 6.17, 49% of those interviewed indicated that not all the employees' details in the public health sector were captured in PERSAL. Only the permanent health workers employed through the Provincial Health Department with PERSAL numbers for identification are captured, making it challenging to monitor and manage the number of skilled workers in the public health sector. This corresponds with 37% of the respondents from the quantitative analysis group in Figure 6.16, who disagree that all health workers' details are captured in the HRIS. Respondents EI04 and RI07 believed that they do not capture details of locums, and other casual workers through provincial health.

However, 20% of the interviewed participants argued that the permanent worker's details were captured in HRIS. Yet, they did not have access to the system, which makes using HRIS difficult to manage the skilled health workforce, which corresponds with the 28% response from the quantitative analysis. This argument corresponds with Randle et al. (2017) and Sankar et al. (2021), who raised the idea of not being able to capture the details of all employees in the HRIS and also not allowing workers access to the system. This creates dissatisfaction in organisations, making it challenging to monitor the services rendered by the entire skilled workers.

7.2.2.1.4 HRIS functionalities

Numerous studies identify several widely used HRIS functionalities, which according to Maamari and Osta (2021) are payroll, time and attendance, benefits administration, recruiting and learning, self-service performance appraisal/record, absence management, scheduling and analytics. The following are the result of the findings concerning functionalities in the PERSAL system:

Payroll: Most HRIS used in organisations are specifically acquired for payroll purposes. Payroll is regarded as the workers' salary system (Kaur, 2021). In Figure 6.19, 89% of the participants positively reacted to their use of HRIS for payroll in the public health sector, but there were still complaints of several human errors in their payroll, which is frustrating. This study is in line with Nagadeepa and Shaji (2021). They indicated that the primary purpose of HRIS in most organisations is for information relating to payroll administration, remuneration management, positions, job descriptions and personal profiles, which are administrative-related functions. Such a system needs to be fully automated.

Time and attendance: The use of time and attendance management in HRIS was also essential for an organisation that employs many workers (Pieris & Preena, 2020). In Figure

6.19, 60% of the participants were not familiar with the question, and 20% disagreed, which means that the public health sector does not use HRIS for time and attendance monitoring. Respondent EI04 mentioned that "time and attendance are done manually on the attendance register at the entrance door of their hospital". This study corresponds with Tesha's (2020) study. Both studies mentioned that the adoption of HRIS in the health sector is a crucial situation because HR functions for effective job performance; they need time and attendance tracking systems through a biometric process for effective monitoring of their health workforce.

Benefits administration: This has been an important functionality in the HRIS usage to manage the long-term benefits accrued to employees (Pandita & Mahato, 2016). In Figure 6.19, 35% of the participants showed that they do have benefit administration in the HRIS, where they capture information on workers' long service awards, benefits, and pension funds, amongst others. 17% responded that sometimes information on their benefits was not accurate and was untrustworthy because the workers were not allowed access to monitor their details for immediate updates and effectiveness through HRIS. Pieris and Preena (2020) found that some organisations do enable employees to establish and maintain their benefit components in the HRIS. The management would then administer the benefits requested by the employees through the system, from medical to retirement pension benefits. Such a system is still lacking in the public health sector of SA.

Recruiting and learning: This part of HRIS contributes to strategic decisions in organisations that want to achieve competitive advantage (Daniels et al., 2007). In Figure 6.19, 30% of the participants mentioned that the PERSAL used in the public health sector of SA did not have recruitment and learning functionalities. Also, they did not have any other IS used for recruitment and learning functionalities. Most participants were not aware of HRIS for recruitment, it was done manually. Scupola and Pullich (2020) found that an effective HRIS can assist organisations in streamlining the recruitment process automatically by having both communication and data in one place. This will help to improve recruitment productivity where anyone familiar with the internet can use the system for easy application and immediate response.

Performance appraisals: This is also an HRIS functionality used to monitor, regulate and record workers' performance (Bibi, 2020). In Figure 6.19, 37% of the participants made it known that performance appraisals were not conducted or managed through the HRIS in the public health sector; they used PERMIS, which is not linked with HRIS. This indicates that HRIS is not effectively used for performance appraisals. Widjaja et al. (2021) found that employees' performance appraisals result from the quality and quantity of work achieved by a

person carrying out their duties and responsibilities assigned to them in the improvement of organisational performance. PERSAL systems are not assisting in achieving that.

Self-service: This functionality is usually of two types:

- **Employee self-service:** Where the workers are allowed access to capture some of their basic details. Such details include login queries and monitoring the response from the HRD and management (Heikkilä, 2013).

- **Management self-service:** This is where managers are given access to work on their subordinates' components of the employee self-service for approvals (Snicker, 2013).

In Figure 6.19, 43% of the participants indicated the non-existence of self-service in the PERSAL system used in the public health sector of SA. Some of the participants were unaware of the answer and showed a lack of knowledge about self-service functionality in the public health sector. This finding supports the argument of Gautam (2017:271), who believes that some of the significant advantages of effective HRIS are to achieve goal-setting options. Having self-service in the HRIS allows workers to set their own goals and enable the management to monitor, manage, and assist them in achieving those goals without face-to-face contact.

Scheduling: In Figure 6.19, 46% of the participants negatively responded to HRIS usage for scheduling in the public health sector. They reported that the job schedule was done manually, which was a setback for the effectiveness of HRIS. This argument corresponds with Treviño-Reyna et al. (2021) that many healthcare workers had their job descriptions defined. Still, their work schedules are often not identified due to an unsophisticated system used to assist in planning and structuring their work structures. Also, Gautam (2017:273) made it known that a significant HRIS functionality for workforce management is a scheduling system that assists with business intelligence and placement of workers for shifting requirements. It is relevant for effective workforce management.

Absence management: This was indicated in Figure 6.19, 37% of the participants made it known that absence management is paper-based and not on HRIS. 24% argued that they have absence management, but such functionality was only on a manual system. Papa (2016) found a need to have an absence monitoring and management system in the HRIS. Furthermore, an effective HRIS can automatically identify and deduct excess leave days used and allow workers to view their information relating to absence management on the system if effectively utilised.

HR analytics: This functionality supports the HRD and the management in making strategic decisions relating to workers' intellectual capital and ways to boost employee motivation and morale for an effective workforce (Liu et al., 2020). In Figure 6.19, 22% of the participants negatively responded to the use of HRIS for analytics in the public health sector. Some of the participants were unfamiliar with analytics as HRIS functionality. Etukudo (2019) highlighted that analytics is a critical functionality in an HRIS that assists the HRM in successfully improving organisational performance by reducing costs relating to the workforce, improving the quality of workers recruited, talent management, employee engagement, etc. This functionality is lacking in the HRIS of the public health sector of SA.

7.2.2.1.5   Some identified HRIS functionalities used in the health sector

The participants reported that the functionalities in PERSAL are: i) personnel management: dealing with appointments, qualifications, personal credentials and other documentation, ii) labour relations: dealing with the union and other related matters, iii) disciplinary: deals with disciplinary matters, iv) salaries and allowances: deals with basic salaries, leave allowance housing allowance, transport allowance and other allowances, v) deductions: deals with tax, pension fund, and other deductions. This indicates that PERSAL is not fully loaded for an effective system in place in the public health sector of SA.

7.2.2.1.6   HRIS functionalities to communicate with HRD and management

In Figure 6.17, 78% of the interviewed participants indicated that there is no functionality in the HRIS or any other IS that workers can access to communicate with HRD and management on the problems they are facing in the workplace. Such functions are manually conducted with no proper control, record keeping and processes to assist in the motivation and management of workers to remain at work. In Figure 6.16, 69.6% of the participants in the quantitative analysis also disagreed that there were HRIS functionalities available for communication between workers, HRD and management.

Respondents RI04 and RI10 mentioned that no functionality in HRIS exists that workers use to interact with HRD and management. But at the facility level, they had a manual system in place where they report to their superiors on their problems. If they were not satisfied, they could go to the hospital manager, and if not satisfied, they would get permission from the hospital manager to visit the HRD in the substructure to make their complaints.

Ferdous et al. (2015) mentioned that the challenges associated with effective implementation of HRIS are meeting workers' expectations, loss of personal interaction between HR,

management and the workers through the development of an informational culture and the elaboration of the change management approach. This view resembles those of Heikkilä (2013) that HRIS is the automation of HRM systems through a web-based application to change the nature of interaction among HR workers, employees and management to move from a face-to-face to technology-based relationship.

7.2.2.1.7 *Exit interviews in health*

There were indications from some of the interviewed participants that they did have functionalities in PERSAL to capture reasons why people were leaving the public health sector. Still, such functionalities were ineffective, which is a problem in the sector.

Respondents RI04 and RI06 thought that they did have an exit interview conducted when staff left, but such interviews were not captured on PERSAL, making it ineffective. Respondents RI15 and MI09 also indicated that they did not have IS functionalities for exit interview capability; if such an IS exists, it will go a long way to improving the situation, but at the time exit interviews were manually conducted.

This argument is in line with Mahlulo (2020), who indicated that exit interviews assist in identifying reasons why employees resign, and such reasons vary from personal to professional. Also, the interview is usually a face-to-face interview which could be intimidating to some employees and should be automated and confidential to give the people free of mind to furnish the correct information.

Further to the exit interview, some of the participants are also of the opinion that there is no support system in place for the retention of workers. Also, the lack of steps to follow to discuss people's resignation, lack of job satisfaction, and lack of feedback from the HRD to educate the workers on the reasons why people are resigning from the sector are attributed to the lack of adequate structures to deal with resignation. Thus, the lack of effective systems to deal with grievance, frustration, and politics at work, preferential treatment, and the poor working environment, amongst others, are other reasons affecting HRIS's effectiveness in monitoring and managing the skilled health workforce.

7.2.2.2 SRQ2.2: How does HRIS assist the health sector in encouraging skilled workforce retention?

Literature is merged below with the discussions relating to the questions asked to elaborate on how HRIS assist in encouraging retention in the public health sector.

7.2.2.2.1 Identifying skills gaps

Identifying skills gaps has been an issue that affects the public health sectors in most countries like SA (Mateus et al., 2014; Wall & Vienings, 2017). In Figure 6.20, 43.5% of the participants disagreed that PERSAL is in use in the public health sector to identify skills gaps because it is not strategically aligned for such function. However, 17% of the participants argued that skills gaps are monitored manually, not through HRIS. This argument corresponds with Wall and Vienings (2017). They claimed that SA does not have sufficient skills to plan, operate, build, and maintain service delivery in public institutions. The current HRIS (PERSAL) cannot assist in identifying and managing skills in the various sectors of the country's economy.

7.2.2.2.2 Recording workers' details

Identifying the statistics and IS to keep a record of skilled workers in the health sector of WC and SA, in general, cannot be identified through the HRIS used in the public health sector. As seen in Figure 6.21, 51% of the interviewed participants mentioned that such information can be derived from the various professional councils/bodies of which the health workers must be registered members. Otherwise, unregistered health workers would not be identified in their IS. 10% of the interviewed participants argued that not all skilled health workers are registered with the professional council/bodies which require focus. However, 39% did not answer due to a lack of knowledge of such information systems.

Respondents MI05, EI06 and EI11 believe that the HPCSA, SANC and SAMA and other professional bodies are responsible for keeping a record of their registered members and are expected to furnish such information to the public health department. But such a system is still not comprehensive to identify the entire skilled health workers in the sector.

This study supports the argument of Adam and Suleiman (2018:56) who proposed the need for the government to provide policies for support and introduce statistical data using the HRIS in the entire management of the public sector workforce. Further, to produce an annual financial and statistical report on the health workforce and information system availability to identify educated, trained, and experienced health workers and monitor their work potential for effective decisions.

7.2.2.2.3   Salaries and other benefits

An effective HRIS is expected to generate information and assist in determining salaries and other benefits of workers in organisations for strategic objectives. According to Kumar and Parumasur (2013), a unified HRIS can help manage workers' concerns, salaries, details, benefits, leave, and other HR functions efficiently. In Figure 6.21, 59% of the interviewed participants disagreed that the HRIS used in the public health sector assists in determining or improving salaries and benefits. Such determination is based on people's years of service, qualifications, and experience levels. In Figure 6.20 of the quantitative analysis, 41.3% of the participants disagreed that HRIS was used to determine salary and other benefits that correspond with the 59% of the interviewed response.

However, 27% of the interviewed participants argue that such a process of salary and benefits could be much more effective in using HRIS. Still, currently, the system is not assisting in making such decisions.

Respondents EI13 and RI08 mentioned that they did have an SPMS where managers would have performed an appraisal on a Key Performance Plan (KPP), like administration, clinical governance, management, and teaching, then make a recommendation for reward, and that was not the responsibility of HRIS.

This finding corresponds with Oyaro's (2018:38) study on the challenges of HRIS at a government establishment which indicated that HRIS could be used to improve the recruitment and selection process in terms of efficiency, effectiveness and cost, but not on salary adjustment and promotion decisions which was a challenge for the effectiveness of HRIS. Respondent MI07 also reported on the issue that "the HRIS was supposed to pick up immediately after someone is employed in the facilities, but up till this very moment (date of interview), her salary and other benefits update are still in arrears (9 months down the line)". HRIS need to be timely and accurate.

7.2.3   RQ3: How can HRIS be utilised to assist the health sector in improving its services to the public?

To reiterate, the third research question (RQ3) for the study was: How can HRIS be utilised to assist the health sector in improving its services to the public? This discussion combines the findings from SRQ3.1 (How can the government support the use of HRIS to enhance service delivery in the health sector?) and SRQ3.2 (What benefits could accrue in the effective use of HRIS in the health sector?) These two sub-research questions (SRQ3.1 & 3.2) provide answers to research question (RQ3).

7.2.3.1 SRQ3.1: How can the government support the use of HRIS to improve service delivery in the health sector?

Discussions on the findings are linked with literature concerning the questions asked in this section to identify the government support for using HRIS to improve service delivery in the public health sector.

7.2.3.1.1 Government regulations

Figure 6.23 show that 67% of the participant's opinion is that the government does not assist in putting in place requirements to regulate the effective use of HRIS in the public health sector. This may be due to their indifferent attitude of not investing and upgrading the system to be up to standard. Respondent MI07 complained that "the HRIS is supposed to pick up that they have worked for 3 years in a post and their salary supposed to be upgraded, so they do not have to stress much and keep complaining of their wrong salary grade, but that is not happening due to lack of effective regulations".

These findings are in line with Sobers (2020:3), who remarked that the potential for growth in the health sector in Africa and the regulatory compliance of effective HRISs is still in its early stages. The introduction of a regulatory unit for a strategic health system through HRISs in Africa is needed to assist governments to improve service delivery.

7.2.3.1.2 Government support

80% of the participants in Figure 6.24 argue that government do not support the use of the HRIS to improve service delivery. The government does not realise that the health workers have critical skills and should know what goes on in the HRIS and how the users are coping with the standards of a system. This corresponds with 54% of the responses from the quantitative analysis in Figure 6.23 on their disagreement that government does support the facilitation of HRIS usage. Respondent MI04 indicated that "the government needs to go to the ground floor and find out how the system works for the people. Because they get managers who do not work on the system and do not know the challenges the users face, when issues like this come up, it will help the government make improvements for easy access to PERSAL. Still, at this moment, the system is not as effective as expected".

Hanif et al. (2014) signal the need for strong government support by creating strong innovative awareness, training, and financial support for sustainable adoption of HRIS. Achieving

competitive support will require implementing IT strategies through government support in the health sector (Masum et al., 2020). For an effective HRIS solution, a supportive and full government support system is required to contribute to the widespread use of HRIS and set regulatory standards such as a legal identity that aims to recognise the skilled health workers as critical skills in the country.

7.2.3.1.3 Effectiveness and efficiency of the health department

In Figure 6.24, 46% of the interviewed participants disagreed that HRIS contributes to the effectiveness and efficiency of the National Department of Health of South Africa (NDHSA) activities because the system is old and cannot assist the management in what they need to do to elevate the skilled health workforce and improve service delivery. This is in line with the response from 37% of the participants in the quantitative analysis in Figure 6.23; they also gave a negative response to the statement that HRIS is used to achieve an effective and efficient health system. Respondent MI03 emphasised that PERSAL "could be effective in its way. The system was introduced in the late '90s. It is still a DOS version, not biometric. They need a system with the latest technology".

29% of the interviewed participants in Figure 6.24 argue that the system is supposed to assist the government in monitoring the activities of everyone in the public health sector on how to work and improve service delivery. Still, the system is not doing that, which aligns with the response from 33% in the quantitative analysis in Figure 6.23. This argument corresponds with Riley et al. (2012:1) relating to the absence of a fully automated HRIS in the health sector. They expressed the need to have available and high-quality information that can be used to support effective and efficient HR strategies and investments in the public health sector.

7.2.3.1.4 Healthcare mobile services

Africa is considered a poor continent, and some healthcare services are conducted in mobile units. Therefore, the question was asked to the participants on the identification of HRIS usage in mobile units. In Figure 6.24, 39% of the interviewed participants responded negatively that HRIS was used to monitor the activities of the workers in the mobile services. They reported that such a process was manually done by using a register for workers to sign as proof of attendance. This is in line with the 39% response from the quantitative analysis in Figure 6.23, with a negative response to the statement that HRIS is used in mobile services. However, 49% of the interviewed participants in Figure 6.24 did not respond to the question because they probably had never been transferred to or sent to explore mobile services.

Mathews (2017) contends that the mobile units are allocated to the sub-districts of their area. This is how they are monitored, just like the hospitals without an HRD. There is a need to introduce a mobile devices-based management network for advanced technology in the public health sector for proper communication, performance, reporting, teamwork, knowledge sharing, learning, and administration through a wireless mobile HR application using extranet applications, internet, and intranet connections (Warui, 2016).

7.2.3.1.5   *Leveraging employees' talent*

In Figure 6.24, 59% of the interviewed participants mentioned that HRIS used in the public health sector does not assist the government in leveraging employees' talent in the right place; also, that the government is not responsible for deciding where people must be placed in the public health sector. Respondent RI12 believes that "the government does not determine who must the placed in any position; the management of the hospitals does it manually".

The management of the hospitals/facilities decides where to place people through a system known as 'change-over', which is done manually. In other words, a changeover in health is a situation where a worker or a system is changed from one position or situation to another (Mathews, 2017). The change-over system is not automated through the HRIS (PERSAL) and could be influenced by grievance, politics at work, and victimisation amongst others. This corresponds with the 46% response from the quantitative analysis in Figure 6.23. They also gave a negative answer that current HRIS is not sophisticated enough to support the public health sector to leverage talents.

Further to talent placement, in Figure 6.24, 15% of the interviewed participants and 17% in Figure 6.23 who responded to the quantitative analysis both argue that the HRIS (PERSAL) could assist because they believe that the system can be used to identify individuals and where they work. Still, currently, the system is not helping in that aspect.

This study supports the argument of Ali et al. (2021:6795), on effective HRM functioning. The government needs to use HRIS to perform tasks such as forecasting the needs of staff, filling vacant positions, and deciding whether to use temporary or permanent staff. HRIS can also be used to select and train the best employees, placing employees in the correct positions where they could be comfortable working and allowing everyone to learn the work of other departments for skills improvement. For an effective talent/knowledge management process, they need to ensure that the right people are chosen to fill the correct positions and are in the correct department where they can develop their skills and also motivate retention (Aggarwal & Kapoor, 2012:9).

7.2.3.1.6 *Promotion and transfer of workers*

On the issue of HRIS usage to assist the government in determining promotion and transfers in the public health sector, in Figure 6.24, 66% of the interviewed participants gave a negative response to the use of HRIS to effect promotion and transfer. PERSAL is not updated to perform such functions. In Figure 6.23, 41% of the participants in the quantitative analysis also disagreed that HRIS used in the public health sector assists in effective promotion and transfers. Also, the government does not have policies to allow such functions through PERSAL. People had to resign from their current position and re-apply for a new position or transfer to other hospitals, which is unreasonable. Oyaro (2018:38) noted that at government establishments, HRIS can help improve the recruitment and selection process in terms of efficiency, effectiveness and cost; not on salary adjustment and promotion decisions, which is a challenge. Some of the participants highlighted that workers are often sent for training at the expense of the state, and after training, they would not be retained, which is also a defect in the use of HRIS to assist in curbing such loss on investment by the government.

This view resembles those of Singh and Bakshi (2018) in identifying a new technology to be used in organisations to record employee attendance, transfers, removal and promotion and how that information could be used in an effective way to improve service delivery in the public health sector.

Furthering to promotion and transfers, in Figure 6.24, 15% of the interviewed participants argued that HRIS does assist in pay grade but not on promotion and transfers, which also supports the response of 20% of the participants in Figure 6.23, which is only pay grade is done through HRIS (PERSAL). 20% of the interviewed participants did not respond, probably because they are not familiar with the HR systems. Respondent EI13 contended that "paygrade is automatic except if your SPMS says otherwise. In terms of plan progression, if your manager says your work is up to scratch every year, you get a notch (raise) in salary every year. If your Occupational Specific Dispensation (OSD) is ok as a doctor, from grade1 you work for 5 years, you get a notch (raise) and move to grade 2, after 5 years you get a notch (raise) and move to grade 3 where you remain till you retire".

Kumkar and Rajhans (2015:1956) advocate the need to introduce an employee re-assign functionality added to the HRIS to deal with worker transfers, salary revisions, promotions, designations, delegations, confirmations, and salary structures for workforce sustainability in organisations.

7.2.3.1.7   Management access to HRIS

In Figure 6.24, 73% of the interviewed participants agreed that they had Deputy Directors (DDs) in charge of HRD but were unsure if they had access to or use HRIS. Also, 50% of the participants (Figure 6.23) (quantitative analysis) positively responded that they did have superior authorities in charge of the HRD. Still, the question of their access to PERSAL was not explainable. They were supposed to be familiar with what goes on in HRIS through access. However, they had not done anything to upgrade PERSAL, which might indicate that they did not make use of the system. Respondent EI13 believed that "most senior managers might be using HRIS because they get fed with any HR information needed at their fingertips, but there is a need for all workforce information to be transparent".

This finding corresponds with Gandolfi's (2015) views based on the functional objectives of the person in charge of HRD. Such a person, like the DD of HR, is responsible for maintaining the department's contribution at an appropriate level to the organisation. Valuable resources can be wasted if the HR functions are not upgraded because of a lack of knowledge by the management of what exists or needs to exist in the system.

7.2.3.2 SRQ3.2: What benefits could accrue in the effective use of HRIS in the health sector?

Discussions on the findings are linked below with literature concerning the questions asked in this section to identify the benefits that could accrue in the effective use of HRIS in the public health sector.

7.2.3.2.1   Identifying positions and placements

The identification of workforce title, position and placement are characteristic functions in an HRIS for workforce identity. In Figure 6.24, 59% of the interviewed participants indicated their disagreement that PERSAL assists to identify workers' positions and placement in the public health sector because the system lacks such a function. Figure 6.26 shows that 52% of the participants from the quantitative analysis group disagreed on the issue of HRIS (PERSAL) assisting in identifying positions and placements, which align with the former's response.

Respondents EI03 and RI09 mentioned that HRIS does not assist in identifying job positions and placing people in positions; available positions are monitored on the ground floor. People need to write an incidence report to be moved to a different position.

Ruël and Bondarouk (2018) made it known that the success of HRIS includes the internal job positioning of workers, e-recruitment, and e-learning through the system. 15% of the interviewed participants argued that HRIS could be upgraded for such functions, but currently, it was not designed for such operation, which did affect the benefit of using the HRIS in the public health sector. This study is in line with Hamad et al. (2019:21) on the fact that the HRIS can assist in communicating through an active modification of the performance system by assisting in preparing and selecting an adequate candidate for a trained specific position.

Perhaps the failures of software development management models are a threat to such functions. Thus, an effective HRIS could aid an organisation in recognising available positions, being effective and accurate and specifying the positions to be filled and also the skills required for these positions (Zeb-Obipi & Kalio, 2018).

7.2.3.2.2   HRIS interaction with other information systems

Questions on the Interaction of HRIS with other information systems in the public health sector were asked in this study. In Figure 6.27, 41% of the interviewed participants negatively responded to such interaction between HRIS and other information systems. They believed that the PERSAL system was a stand-alone system and does not connect with any other IS. In Figure 6.26 of the quantitative analysis, 33% of the participants also gave a negative response to HRIS interaction with other information systems in the public health sector. Although most of the participants did not answer the question, they are not familiar with what goes on in PERSAL.

Respondents DI02 and EI04 mentioned that the clinical information systems such as Single Patient Viewer (SPV), Electronic Client Clinical Record (ECCR), Clinicom, Tier.Net and PACIS do not interrelate with PERSAL.

However, 22% of the participants (Figure 6.27) argue that HRIS could interrelate with other information systems used by other organisations. Such systems include Home Affairs (HA) systems, South African Revenue Service (SARS) systems, and Basic Accounting System (BAS) for the finance department. However, the participants could not confirm the interrelation between HRIS (PERSAL) and those other information systems mentioned.

This argument supports Boon et al. (2019:2), who tend to agree that the focus should be systematic because employees are simultaneously exposed to an interrelated set of HRISs rather than a single platform. The effects are likely to depend on having an updated HRIS in

place. The system is still manually operated, and not upgraded to perform the interrelated functions, thus depriving the public health sector of potential benefits.

7.2.3.2.3   *Forecast workforce budget*

HRIS can be employed to assist the government in forecasting the health workforce budget. 28% of the participants (Figure 6.26) confirmed that permanent staff salaries are prepared and paid through the PERSAL. Therefore, the public health sector could use such figures to forecast the budget for staff salaries. However, this cannot cover the budget of the entire public health sector workforce. Tursunbayeva et al. (2015:2) suggest that 65-80% of the healthcare budgets are spent on salaries and other forms of remunerations; there is a need to have a successful HRIS to assist in improving service delivery, which will help to keep a record of the skilled workforce and assist in the strengthening of the workforce process. It would be easier for organisations to track precisely how much money is spent on recruitment and recruitment-related expenses to plan salary budgets with more accuracy (Zeb-Obipi & Kalio, 2018:14).

Further to the budget forecast, 15% of the participants (Figure 6.26) argued that PERSAL was supposed to assist in budgeting for salaries paid to skilled health workers. Still, the system did not assist in achieving that purpose because not all the skilled health workers' details are captured in PERSAL and not used for strategic purposes. Some of the participants were not familiar with the system due to a lack of knowledge and education.

This finding corresponds with Laurenzi's (2020:15) study, which found that in the 1970s, many healthcare programmes were operationalised by non-governmental actors. The non-governmental actors attempted to provide more equitable care, and the healthcare budgets were under-allocated and often misappropriated due to a lack of technology usage in the preparation of accurate budgets in the public health sector of SA. The need for an updated technology such as HRIS for health-specific budgets in the country, and to overcome such budget lapses (Lei et al., 2021:12) is long overdue.

7.2.3.2.4   *Policies in place*

The question of whether the public health sector has policies in place for effective HRIS in the health sector was posed. According to Shipalana (2019:796), the use of HRIS assists in providing information for effective policies and planning aimed to evaluate the quality of data, and influence and strengthen the decision-making process in the health sector. In Figure 6.27, 39% of the participants agreed that even though the HRIS was still primitive, there were

policies to support the system's use. Such policies are related to signing a consent agreement not to disclose information without approval. Also, leaving the computer system open, unattended, and capturing information without approval, were not allowed. 33% of the participants (Figure 6.26) also affirmed the existence of policies to support the use of PERSAL in the public health sector.

Respondents EI04, EI11, and RI03 believed that the users signed a consent agreement that if they made mistakes and captured wrong information on the system, they would be held liable. There also where policies in place whereby people are given a cut-off date and time to submit their HR-related documents for capturing on the system.

Staying on the issue of policies, 44% of the participants (Figure 6.27) affirmed that they were not familiar with the policies. 22% disagreed that policies existed because they were not given access to the system. They were expected to submit their leave, overtime, and other HR-related documents at cut-off dates, which were often not captured accurately or on time. Such performance demoralised the skilled worker's performance ability.

This finding also corresponds with 22% of the participants in Figure 6.26 who disagreed that effective policies were in place. Bayraktaroglu et al. (2019:48) affirm that an HRIS is a valuable IS where users are comfortable with the policies and reports generated. These reports can only be efficient if the data captured is accurate with appropriate procedures to safeguard the information for better healthcare information as part of the benefits of using HRIS.

Matimbwa and Masue (2019:135) made some suggestions in their study. One of their suggestions is that government should increase budget allocations to national, provincial, and local health departments to ensure the adequate improvement of healthcare facilities. They also suggest the development of a skilled health workforce in the country. A third suggestion was to support reinforcement of coordination between different health departments responsible for HRIS management to speed up information flow to system users for complete and accurate output and timely updating of employees' information.

7.2.3.2.5   *Satisfaction with PERSAL*

There was a high rate of dissatisfaction with the use of PERSAL in the public health sector among the participants. In Figure 6.27, 88% of the participants were not satisfied with the state of the current HRIS used in the public health sector of SA. This dissatisfaction might be due to the lack of access for the entire workforce to capture their leave and other HR-related information, the lack of upgrades and the high level of the paper-based system to support the

HRIS (PERSAL). This finding corresponds with the response from 46% of the participants in Figure 6.26 of the quantitative analysis who were not satisfied with the current PERSAL as used in the public health sector and would recommend that an alternative system be acquired.

Respondents MI02 and MI08 mentioned that the government needs to upgrade the HRIS to allow everyone to have access using their unique PERSAL number to capture their basic HR information and relieve the burden on the HRD.

According to Liu et al. (2014:259), most HR functions are not conducted in an HRIS, which causes dissatisfaction among the employees, which is why there is a need to acquire a fully functional HRIS.

Further to the satisfaction of PERSAL, in Figure 6.27, 5% of the interviewed participants and 15% from the quantitative data in Figure 6.26 (skilled healthcare workers) argued that they were satisfied with the current HRIS (PERSAL) because they were not interested in the access as it was not their primary function. Moreover, they complained of being busy with their primary activities (clinical operations) and did not have time to access a computer and perform HR functions; they would prefer someone to keep operating PERSAL. This is part of the problems relating to resistance to change in the use of HRIS.

This finding supports the argument of Siddiqui (2014:179). He argues that the success of an organisation depends on the satisfaction of workers, which is needed to ensure that there is an effective system to motivate, monitor and create a satisfying ability in the workplace for effective performance and benefit to the public health system.

Dilu et al. (2017:2) also highlighted that satisfaction with the use of an HRIS in healthcare still faces numerous challenges, such as: i) unsteady financial capacity to acquire, update and maintain the HRIS, ii) inadequate ICT and HRIS proficiency among the HR workforce, iii) inadequate coordination of government mechanisms in the performance of their legal tasks, iv) instability of internet connectivity, and v) inadequate top management support. These challenges create a lack of satisfaction among the skilled workers with the use of the HRIS in the public health sector.

7.2.3.2.6   *Strategies concerning the benefits of HRIS*

Questions about the use of HRIS (PERSAL) in the health sector to achieve strategies such as recruitment, training, reward, and retention were asked in this study to find out the responses of the participants regarding such accomplishments.

Recruitment strategy: In Figure 6.29, 37% of the participants disagreed that the current HRIS usage does not assist in achieving recruitment strategy because recruitment is manually conducted and not through the HRIS. According to Washeya and Fürst (2021:13), transparency in wage negotiations is the key to filling available positions through an effective recruitment strategy to address workload and ensure that the right people are selected through effective use of HRIS. 26% argue that they get adverts through the internet and other sources, which might indicate the use of technology to support the manual process. The recruitment strategy is still not achievable due to the primitive nature of PERSAL. This finding corresponds with that of Mohammed (2021:96). To achieve a recruitment strategy, HR should follow best practices such as effective recruitment planning, searching for the right candidate, screening, and shortlisting and evaluating the right candidate. Also, ensuring such procedures are conducted through the HRIS for consistency and compliance with the recruitment process (Mohammed, 2021).

Training strategy: In Figure 6.29, 37% of the participants disagreed that the current HRIS (PERSAL) assist the public health sector in achieving the training strategy. This disagreement might be because they do not conduct regular training on how to use the system. Also, the fact that the participants mentioned that other forms of training relating to clinical/medical functions and information systems are not conducted through the HRIS (PERSAL) to assist in identifying those eligible for training in future, is a challenge. 17% also argue that training on clinical functions and information systems is conducted regularly. Still, people have to apply to attend training, which could be influenced by nepotism and preferential treatment, amongst others. They need an HRIS to eliminate the above-mentioned influential factors.

Appiagyei et al. (2014:2) identified the Third Global Forum on HRH in 2013 in their Agenda for Global Action and identified a training strategy to be accomplished that would need to strengthen the health workforce through up-scaling health workers' education and training through an effective HRIS. This finding corresponds with King's (2021:37) study of an effective training strategy using HRIS with complete integrated systems through web-based technologies to manage the HR processes within the healthcare sector and support comprehensive tasks which include appointments, remuneration, performance, evaluation, education and training.

Reward strategy: As seen in figure 6.29, 30% of the participants disagreed that current HRIS assists in achieving reward strategies because the system is for basic administrative functions. It is not used to acknowledge hard-working staff to reward them for the extra effort they put in to benefit the sector. 15% of the participants stated that they get paid their salaries, even

though there are errors, omissions, and uncaptured information in their payslips which could take time to rectify. The process to correct the mistakes might be a challenge that affects the reward strategy. This study corresponds with Mulievi and Juma (2019:936) in their comment that reward strategies can either be a positive or negative effect on a health sector workforce. The influence of the reward strategy in the African healthcare sector is faced with numerous challenges, which are influenced by health specialists and trade union representatives. The major reward problems are poor salaries and lack of other related rewards that must be implemented through an HRIS to properly monitor such processes, to achieve the expected reward strategy.

Retention strategy: In Figure 6.29, 52% of the participants disagreed that the current HRIS assist in achieving retention strategy in the public health sector because of the lack of proper structures to identify and motivate workers to be retained. Also, the system does not give workers access to disclose the problems that could require appropriate attention to keep them at work. 13% argued that they were not familiar with the use of HRIS in relation to retention. Still, the retention of workers is affected by personal decisions that people make due to unsatisfactory IS usage in the sector and the economy's current situation. This study corresponds with Nkala et al. (2021:194) in suggesting the provision of strategies for employee retention through an HRIS to facilitate it. With the retention strategies in place, the HRD would benefit in terms of finding ways to enhance the skills of health work workers by dealing with challenges relating to worker retention. Using an HRIS will also provide information on what is needed to be done to retain skilled workers.

7.3   IDENTIFIED KEYWORDS/THEMES FOR DISCUSSION

From the interviews, keywords were identified as displayed in Appendix L. They were identified across the three research questions and thus discussed as follows:

7.3.1   Primitive/outdated system

Makembo and Oluoch (2018) found that using primitive and old systems for HR functions was responsible for a lack of efficiency and effectiveness within the health sector. As noted in chapter six, it is evident that the current HRIS (PERSAL) used in the public health sector of SA was acquired in the late 90s and is still used as it was acquired until today. This gives the impression that the primitive nature of the system prevents it from being used to make certain strategic decisions that will assist the public health sector in maintaining a healthy workforce.

This suggests that elevating the performance of a health system requires a more modernised IT structure to meet the demand of the workers.

Further to the primitive nature of the health sector information system, participants alluded to the lack of necessary system upgrades as one of the primary reasons for the lack of effective use of HRIS. Palagolla and Wickramasinghe (2013) believe that using an outdated system deprives an organisation of the benefit of stepping ahead of its close rivals to achieve a competitive advantage. PERSAL used in the public health sector is obsolete and unsuitable for skilled health workforce management. Clinical systems are upgraded regularly, and the fact that the HRIS (PERSAL) has never been upgraded constitutes neglect of the skilled health workforce which offers critical skills in the public health sector. This argument is consistent with Gebre-Mariam (2018). They indicated that using non-web based HRIS hinders regular upgrades, and the use of primitive systems is costly and prone to causing bureaucratic delays in workforce management processes.

Monitoring and managing skilled health workforces have been a huge challenge in SA and Africa, affecting their retention. Some of the participants indicated that PERSAL did not allow for HR reviews, queries, and access to interacting with other information systems regarding HR functions. Jayeoba et al. (2020) noted workers' dissatisfaction owing to their inability to interact on work-related matters. Deussom et al. (2012) proposed using an electronic monitoring system in the health sector that will assist in the monitoring of workers. Parikh (2018) also highlighted the use of HRIS to identify and monitor workers' knowledge, skills, and personal attributes for superior performance, which a primitive system such as PERSAL cannot perform. The ability of the HRD to make use of a primitive system to manage and monitor their workforce, produce a report, and reduce costs will require an effective HRIS. The current HRIS is unable to accomplish such processes (Al-Dmour et al., 2015).

According to the participants, it is likely that the gains which accrue from the implementation and effective use of HRIS in the public health sector will elude the sector. Some of the participants argued that upgrading the existing system could be helpful whereby it could interrelate with other information systems, produce accurate information, and save unnecessary costs arising from the system in its current primitive state, to achieve skilled workforce sustainability and retention. Arini and Bangun (2014) contend that the success of a new HRIS can produce outputs that can improve users' expectations with less cost and effort. Cui et al. (2016) believe that there is a lack of success in attracting and retaining a talented pool of workers within the public health sector using HRIS. Zaiter et al. (2021) contend that attracting and retaining health workers without an effective HRIS would create significant bottlenecks which could impact the decisions made by HR in health. An improved HRIS can

assist in improving staff retention, but the such achievement will depend on the expectations of the organisation involved (Pouransari et al., 2016).

The fact that the PERSAL system is still primitive puts pressure on the skilled workforce to do more, thus necessitating an improved system for effective service delivery in the public health sector of SA.

The findings on the lack of government support align with Matsiko's (2019) analysis that countries such as SA lack the sustainability of regulatory compliance in ICT. Further, government support is needed to enhance ICT which will lead to government support (De Haan et al., 2005; Tiwari, et al., 2021b). As the participants contended, the lack of government support for the HRIS upgrades affects service delivery in the public health system in the Western Cape. Responsibility for the decisions relating to system upgrades for salary and other financial adjustments rests with the government (Oyaro, 2018). As the participants also indicated, the policies needed for an effective health system are not keenly followed by the management of the healthcare facilities. In this regard, the government needs to do follow-ups with the management to implement their policies and assist in tracking staffing and HR-related activities through upgrades of the system to eliminate its primitive nature.

Overall, the high rate of dissatisfaction expressed by the participants on PERSAL, calls for a new HRIS to comprehend an effective public health sector. This may improve service outcomes (Iwu & Benedict, 2013; Arini & Bangun, 2014).

7.3.2 Manual intervention

Lengnick-hall and Moritz (2003) indicated that carrying out HRM functions through the internet or intranet brings several benefits, including flexibility and speed. When work processes, including HR management, are conducted manually, frustration and low productivity set in (Iwuet al., 2012). Manual intervention is felt to be a normal phenomenon in healthcare functions in African countries. One of the significant factors mentioned by the participants that affect the health system is that most hospitals have information security issues due to the lack of a full-fledged HRD and the predominance of manual systems. Some of the administrative HR functions are manually carried out (such as storing documents in a filing cabinet) and are unsuitable for the present-day situation of running an effective health sector. These findings correspond with Hawash et al. (2020), who indicate that eliminating a manual system will require adopting an electronic records management system which includes features relating to the capture, description, management, storage, dissemination and retention of records in electronic form.

Kebede (2017:6) found that some of the obstacles that hinder effective HRIS implementation for suitable workforce management include the lack of computers and computer knowledge among workers. The participants in this study indicated that most hospitals do not use computers and HRIS for HR functions. Still, they have a manual system of capturing all the worker's details in their hospitals from the permanent workers, locums, casual workers, volunteers, security, and other agency staff. This shows that the public health sector HR functions are more manual than technological, which can negatively impact the retention of workers. This study corresponds with Gliklich et al. (2019:1), who found that IT in health is slow in progression over the past years. Computerised records should be used in hospitals rather than manual record-keeping.

Ahmadi et al. (2017:161) identified technical incompetence and lack of employee knowledge of IS availability in an organisation as factors that impede the adoption of HRIS. The participants emphasised that the manual system of doing things in the public health sector has created a platform where most people do not think about how the HRIS can improve their work performance. In this situation, the system does not allow all workers access to the system, or to the permanent workers' details captured in the HRIS. This indicates a lack of knowledge and idea of the existence of HRIS by the workers. This finding corresponds with Rafferty et al. (2019:26) study which found that for an effective HRIS to be in place, procedures relating to knowledge sharing and strengthening of the workforce, solidifying monitoring services, refining collective actions and relationships need to be considered. People need to be allowed to capture their leave and other basic HR information in the HRIS, and then do follow-ups on the system, for effective management and retention of the skilled workforce.

Muinga et al. (2020) explain that the users of the health system are confronted with poor system usability and inadequate training, because of the manual process of managing the skilled health workers. Lack of training on IS in the public health sector is also an issue that the participants highlighted. The participants further stated that the public health sector regularly conducts training on clinical functions and information systems, but not on HRIS. Such training is also manually conducted and not through the HRIS. Moreover, the current HRIS cannot be used to identify who should be trained and when. All these are manually observed in the public health sector. Even for training in clinical systems, workers have to apply personally to attend training and wait for the management to decide. This study corresponds with Spero et al. (2011:1) in their comment that HRIS can be used to track and monitor health workers and assist in health workforce planning for recruitment, training, and deployment, which could strengthen the healthcare if effectively utilised.

Das and Barman (2018:4) outlined that essential IS functionalities include time and attendance and absence management to eliminate manual processes for speed and flexibility. The participants in this study shared that they 'clocked' in manually and relied heavily on other manual structures at their hospitals. As the participants have indicated, and according to Thakur (2016:2), organisations need to introduce an effective IS that will help in managing their HR processes and also link different sections of their department together through a single ERP platform. An important HRIS deliverable is monitoring and performance management. Equally, analysis of healthcare using HRIS ensures effective monitoring, evaluation, and governance and even assists with grievance management (Khan, 2019:1). Little wonder, therefore, why researchers such as Witter et al. (2020) continue to advocate that more South African-based research should examine how the public health sector adopts and implements specialised functionalities in HRIS for health workers' access. Such research should also identify HRIS as a retention avenue to improve operational capability enhancements.

According to Ahmed (2016:2), the evaluation of workers' performance assists in providing the critical foundation of management decisions in the allocation of duties and responsibilities, provision of feedback to workers about their performance, training and development, promotion, demotion, transfers, and salary payments. Promotions and transfers are identified as part of the reasons that cause dissatisfaction in the workplace. The participants made it known that HRIS (PERSAL) does not assist the health sector in identifying who should be promoted or transferred. For someone to be promoted or transferred to other hospitals, they have to resign from their current position and re-apply for such movements. This process reduces workers' confidence in putting their efforts into the work because such processes are still manually inclined, which affects their performance and service delivery. This finding corresponds with Singh and Bakshi's (2018) study, which suggests introducing a new technology to be used in organisations to record employee attendance, transfers, removals and promotions. Their study also suggests how the system could be used to modernise processes that could be supported by the government and management of the organisation.

The participants specified that the current HRIS (PERSAL) does not assist in the retention of a skilled workforce in the public health sector of SA. Rees et al. (2021:1) believe that the uncertainties caused by COVID-19 impacted skilled workers and the health sector. There is a need to have a long-term planning strategy for healthcare skills retention through an effective system to view the skilled health workforce as an investment for preventive measures for post-COVID-19 uncertainties.

There are several ways the government has been conducting health-related processes. Such processes are manually conducted because they feel comfortable using the manual system of doing things rather than transforming most of the process to automation. This corresponds with Malindadi's (2016) research which stated that most public sector departments are still using the manual system and are quite comfortable with it because they do not believe that the government will invest more resources or other capacities to support an HRIS.

Boateng (2007) argues that the most challenging aspect of organisational performance is the lack of knowledge sharing and strategic workforce analytics. These negatively affect the organisation's strategic management due to manual processes. There is therefore a need for a change process in the health sector IS.

7.3.3 Basic administration of information

In most organisations, HRIS is used for basic payroll purposes, which is administrative. Altaf et al. (2019:1661) emphasised that HRIS is usually for operational HRM where organisational functions such as payroll and employee personal details are managed for HR administrative purposes. Based on the information gathered from the participants, the PERSAL used in the public health sector is not effectively used for the primary purpose; the system is used for payroll and captures workers' details, which supports the findings of Altaf et al. (2019). The HRIS in the public health sector of SA is used for administrative purposes. Some of the participants argued that the public health sector has an IS for inductions where new recruits could attend inductions digitally and the system prints out a certificate of attendance for the participants without anyone interfering with the system. They need an IS similar to the induction system for HRIS in the public health sector

There is a notion that the public health sector of SA needs to emphasise the use of HRIS for both administrative and strategic purposes because, currently, the system is solely administrative, which makes it unable to assist the government in strategizing retention of the workforce. Some of the participants indicated that the HRIS could help the sector in identifying teamwork recognition awards if an employee performs well through an evaluation with their manager. Such a process is captured in HRIS but does not assist the government in making strategic decisions regarding workers' performance. Sobers (2020:3) contends that the use of eHealth systems in Africa is still in a growth stage. There is a need to introduce support structures for the government in achieving administrative and strategic decisions through eHealth systems in Africa, using effective HRIS platforms.

7.3.4   Access to computers and other devices

Computer literacy, IT and comfort levels vary, particularly among health professionals. Some workers do not have access to a basic computer system (BCS), which impacts the system's effectiveness (Gavurová et al., 2018:1). The participants mentioned that the public health sector uses PERSAL as a standard HRIS, but only certain people in HRD have access, and not all the workers have access to computers. Most hospitals in the public health sector of SA do not have enough computers and do not encourage computer literacy. Computer availability is only limited to clinically related functions and not necessarily for HRIS functions. This finding corresponds with Kuyo et al. (2018:54), who mentioned that lack of management support, lack of adequate computers, unreliable internet connection and lack of backup system are the challenges hindering the adoption of HIS users. There is thus a need to emphasise on the information cohort, endorsement, scrutiny, distribution, and exploitation for an effective system to be in place. Not allowing the entire workforce access to HRIS is a challenge that deprives the effective use of the system to achieve the expected benefits.

According to the participants, the availability of computers has contributed to the lack of effective IS and software upgrades in the public health sector. They made it known that updates are done in HRIS only for regulatory compliance and other changes in government policies such as tax changes and pay rises, not for the entire software system on which PERSAL operates. PERSAL has never been upgraded since it was acquired. Currently, there is a lack of customised IS for weighing the performance of HRIS in health. Agarwal et al. (2019:4) suggest using an innovative framework to measure health workforce performance and identify plans to strengthen healthcare through upgrading the sector towards effective IS.

The lack of sufficient HRIS and other IS functionalities has been blamed on the entire health workforce's lack of access to computers. The participants made it known that they do not have enough rooms with computers, and any available computer has its purpose, most of which are for clinical functions. This indicates that the public health sector of SA needs to focus more on what is to be done to allow skilled workers access to HRIS. Gautam (2017:271) contends that employee computer and HRIS access will empower them to perform HR functions without depending on HR workers.

The participants also indicated that documents and responses to queries are often delayed, and records get lost in the process, which is blamed on the lack of sufficient access to computers. It also deprives the NDHSA of effective and efficient operation to compete with other countries with computerised systems. This view corresponds with that of Nagadeepa and Shaji (2021:15). They explained that an effective and efficient health system results in timesaving, giving workers access to their data, and making the data available at any given

point to assist the workers and the government in increasing their confidence and automating the health workforce responsibilities and events through HRIS.

Tiwari et al. (2021:2b) believe that the unfairness of the government support for public healthcare improvement in computers and IS usage has negatively impacted service delivery in the country. The lack of government support of HRIS was according to the participants partly to blame for the insufficient computers and IS to support service delivery in the public health sector. The participants believe that the government needs to assist in supporting an online application for recruitment and an effective system to track staffing-related activities that can make the work of the health system easier.

7.3.5 Availability of sufficient funds/budgets

The unavailability of sufficient funds to support the use of HRIS to its full potential is part of the factors that affect the public health sector. Lack of adequate funds can create ignorance and lack of interest among the skilled workers and contribute to the employment of less qualified or unqualified persons to do their work. Sirili et al. (2020:149) contend that the lack of sufficient funds has made some countries in Africa adopt a system of task-sharing. This strategy seeks to address the critical health workforce shortage. It was later adopted to advance an unskilled health workforce, which has dampened the quality of health services and resulted in a frustrating work environment and poor incentives.

The participants are also of the opinion that the lack of government support for an effective HRIS in the public health sector is affiliated with a lack of sufficient funds and budgets to support health workforce sustainability. Tursunbayeva et al. (2015:2) showed that 65-80% of the healthcare budgets go to workforce sustainability, yet there is still a lack of skilled workers in the public health sector. This indicates that the government allocates a specific budget for a specific purpose. Specific budgets are earmarked for remunerating locums, casual workers, and other contract health workers at each hospital. Yet, there is still the problem of skills shortages in the public health sector. Also, there is an insufficient budget allocation by the government to put in place an effective HRIS in the public sector. Matimbwa and Masue (2019:135) are also of the opinion that the government needs to introduce important economic avenues such as increasing budget allocations to assist the health sector with an adequate improvement of the hospitals and skills development. The government also needs to promote coordination between different health departments responsible for HRIS management to speed up user information flow.

The lack of sufficient funds and budgets to support an effective HRIS has created high dissatisfaction in the public health sector. The participants indicated that at the hospitals where there is no HRD, they have a one-person unit doing the HR functions manually due to a lack of sufficient funds allocated specifically for HRIS management. Slabbert (2011:33) highlighted the need for the government to provide the required funds and health service delivery instruments that would enable the formation of a sustainable, efficient and equitable health service in SA. Alhazemi (2017) is also of the opinion that allocating sufficient funds and other resources in using HRIS will assist in developing e-government in new technology for modern infrastructure in hospitals.

7.3.6 Infrastructural challenges

The public health sector, in general, is faced with numerous infrastructural challenges in terms of buildings, technology, and equipment, amongst others (Ngobeni et al., 2020:1). Kiros (2018:69) also mentions that HRIS in health is faced with challenges that relate to poor infrastructure, poor network connection and load shedding. As a result, HRIS cannot meet the needs of skilled health workers. Most of the hospitals in this study have been faced with infrastructural challenges due to their size and not having enough space to run the activities of the HRD. Some of the hospitals provide 24-hour service with over 100 workers. Yet they do not have enough rooms for consultations and other health-related functions, and having a space for HRD, computers and other information systems is a challenge. This supports the argument of Ahmadi et al. (2017:161), who mentions that size of the hospital is a factor that influences the adoption of HIS, together with a need to develop an integrated framework that can provide HIS adoption through having a sophisticated infrastructure in place.

Shipalana (2019:796) explains that HRIS provides information for effective policy and planning. Such planning aims to evaluate the quality of data and to influence and strengthen the decision-making process in the public health sector. However, the participants highlighted the need to improve a proper IT infrastructure and equipment, strengthen the skills of personnel, and support the use of HRIS for quality healthcare performance. Thus, a poor IT infrastructure could be blamed for insufficient equipment to support the technical structures of the health sector using HRIS (Phahlane, 2017; Katurura & Cilliers, 2018). Barrett (2021:3) also contend that the role of IT in strengthening the health sector infrastructure is significant in this modern age which is marked by rapid technological developments that routinely affect social change. The government needs to upgrade the infrastructure and IS for an effective health system in SA.

7.3.7 Centralised system

Sligo et al. (2017) note that the public health system is centralised in some developed countries, yet they still face numerous complications and frequently changing structures in their health systems. The participants commented that the public health sector of SA uses a centralised HRIS system. The size of some of the hospitals determines the effectiveness of the system. Sometimes, the response from the HRD to workforce-related queries is delayed or not answered at the appropriate time, which can be frustrating for skilled health workers.

The participants believe that the centralised HRIS used by the public health sector affects the capturing, recording and retrieval of skilled workers' information. The permanent worker's information in the public health sector of SA is captured by selected HR individuals in the HRIS (PERSAL) system, which is prone to mistakes, documents lost in transit, and delays in responses. The permanent workers' information is derived from inter-reliant departments in the public health sector, which often makes the retrieval of workers' details complicated (Ngwenya et al., 2019).

The participants are also of the opinion that the centralised HRIS used in the public health sector makes the function of the HRD centralised in certain hospitals. The policies require people to submit their HR documents such as leave application, proof of address and others by specific cut-off dates. The time for documents to be submitted to the substructure and the information to be captured as expected can sometimes be frustrating. This, therefore, suggests a need for workers to have access to the centralised system for effective structures to be in place. This argument corresponds with Malakoane et al. (2020), who found that there could sometimes be difficulties and shortages in the supply of healthcare services; even though they have a centralised health system which is regarded as a strength, they still suffer from the shortage of skilled healthcare workforce that also create inefficiency and unsatisfactory delivery of public health services.

7.3.8 Sophistication of information system

SA was rated 61 of 137 countries in terms of system sophistication, making SA the highest in sub-Saharan African countries in terms of services, businesses, innovation, and financial market environment. Yet, the system is not effective enough to compete with high-income countries (WEF, 2017). Strohmeier and Kabst (2009) contend that the adoption of HRIS in organisations could be effectively realised, but the deterrent is the organisation's size, sophisticated working environment and the orientation of workers will require attention for the adoption to be effective. The participants commented that the size of hospitals impacts the sophistication of HRIS in the public health sector, where hospitals such as substructures and

MP hospitals are more sophisticated than ER and RT. Even though ER and RT hospitals offer 24-hour services with over 100 workers each, they are categorised as not big enough to have sophisticated information systems such as HRIS.

The lack of a sophisticated HRIS could deter the monitoring and management of the skilled health workforce. The participants indicated that the HRIS could not identify vacant positions and is also not used for a clock in/out system, electronic verification of Identity Card (ID) card system, or to signal the death of workers. Thiede and Mutyambizi (2010:190) identified a gap between the South African public and private health sectors in terms of access to the latest and most sophisticated technology. The public health sector is still struggling to address the health need of poor communities. Using an HRIS to address the needs of the health workforce is still not achievable.
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Engaging people in the proper position at work where they are comfortable performing their duties is another challenge impacting the retention of skilled workers in health. The current HRIS (PERSAL) is administrative and not strategic enough to identify the correct positions in which to place skilled workers, and where they will be comfortable working. Al-Dmour et al. (2015:39) mentioned that effective HR planning is allocating the precise number of qualified workers to the right task and at the right time using a sophisticated HRIS. The participants made it known that the lack of sophisticated HRIS was part of why people resign because they are not comfortable where they are, and the system is not assisting to move workers around to other departments. Some of the participants argue that some hospitals practice a changeover system where they move nurses around. Still, such a system is not very effective and not assisting as expected because it is not implemented through the HRIS or any other IS. Simms (2020:85) believed that the implementation and use of HRIS should be utilised effectively to identify the exceptional skills to be placed in the correct position for competitive organisational advantage.

Not considering the skilled health workforce as offering critical skills discourages HRIS improvement by the government, which negatively impacts service delivery. The participants believe that the skilled health workers should be regarded as having critical skills and should have a single platform IS for HR systems and other information systems used in the public health sector for easy access for all skilled workers. The seminal study of Pilbeam and Corbridge (2002) argues that the importance of HRIS is to have a single platform to capture all employees' details and to regard the healthcare workers as having critical skills.

The participants further mentioned that the current HRIS (PERSAL) is unsophisticated and had caused dissatisfaction among the skilled health workers because the system is still DOS-

based and not Windows-based or any other contemporary operating system. This is one of the reasons for not using the HRIS for strategic HR decisions that relate to the retention and sustainability of skilled health workers. Wasif et al. (2021) emphasised that shifting from MS-DOS to Windows-based HRIS system will assist organisations in adding many features of networking, streamlining multimedia, workforce management, and support structures in providing remote assistance to the organisation.

7.3.9   Timelessness of information

The timeless updating of information in the HRIS affects the capturing, recording and retrieval of information. The participants mentioned that due to information on the system not being updated on time, people could access accurate information on their leave days and other HR-related updates. It is quite frustrating to wait until the end of the financial year to be updated. The fact that people regularly change their addresses, contact details, marital details, and surnames, the HRD cannot update that information on the system accurately within a reasonable period, which is also devastating. Matimbwa and Masue (2019:135) advocate reinforcement of coordination between different health departments responsible for HRIS management to speed up information flow to system users for complete and accurate output and timely updating of employees' information.

The delay in capturing information on HRIS affects the salaries and benefits paid to skilled health workers. The inability of HRIS (PERSAL) to immediately update salary scales, grades, outstanding leave days, and allowances on the system is not tenable. Oyaro (2018:38) indicated that the HRIS assists in planning, setting performance and monitoring the performance of all employees. The government's responsibility is to assist in making the decisions relating to salary and other financial adjustments. HRIS cannot assist in adjusting salaries in the public health sector of SA due to a lack of information updates on time and as required. Some of the participants argue that the lack of government support for effective HRIS could deter the timelessness of information in the public health sector workforce. The government needs to streamline many processes whereby HR will be delivering information on time and accurately. Then all the workers can focus more on working and not be held up by HR-related stress. This argument corresponds with Wushe and Shenje (2019:1), who highlight a relationship between occupational stress and employee performance in public healthcare institutions and point out that work-related stress is a problem faced by organisations that is harmful in terms of physiological and psychological functions of the sector, which in turn causes dissatisfaction of workforce.

7.3.10 Substructural challenges

According to Mathews (2017), the Western Cape Health Department is divided into four substructures that handle the finance, HR, pharmaceutical, and other health sector-related functions. Most of the hospitals fall under substructures. This study found that the public health sector uses PERSAL, but most hospitals do not have an HRD to conduct HR functions. Still, they have one person who deals with HR duties manually and then sends the documents to the relevant substructure to capture on the HRIS. This practice demoralises the skilled workers, affecting their performance at work. Akram et al. (2019:15773) suggest the need for an effective HRIS to assist with lower workloads, shift management, management of costs, and provide a database for health workforce professionals.

The lack of HRD and HRIS presence in various hospitals has negatively affected the working arrangements of skilled health workers. People have to leave their work and travel to the HR substructure to resolve their HR-related queries, which could not be easily communicated through a one-person unit or the hospital manager. Suryana et al. (2019:94) suggest the need to prioritise the fulfilment of HR needs to be in accordance with the needs of the public health centres through the provision of all the amenities to sustain the skilled workers in their workspace.

The skilled health workers' not being able to meet at the appointed time to visit the substructure HRD is another challenge that negatively impacts their performance. A need for a system that they can use to log in to make complaints, and then monitor the process would be a better way to resolve the problem. Kavanagh and Thite (2020:413) proposed that software structures be developed for employees in different regions to enable them to log into their system through personal computers to submit their claims to the authorities rather than having a face-to-face engagement.

The participants identified a high level of dissatisfaction concerning using HRIS through the substructure hospitals. Because most hospitals (20 or more) have to report to a substructure (one hospital), the HRD is unreasonable, which boils down to poor service delivery in the sector. Workers have to concentrate more on solving their HR-related problems and less on their work-related functions. Mathews (2017) and Roberts (2021) believe that the employment and management of workers through a substructure is not advisable to keep a sustainable health workforce in place. They need to allow workers to be monitored and managed through an IS for an effective health system. The benefits of using HRIS in health cannot be measured where the HR functions are operated through a substructure. The participants suggest that the benefits could be accomplished if they allow everyone (skilled workers) access to the HRIS to eliminate travel to substructure hospitals.

7.3.11 Confidentiality of information

The lack of confidentiality of the workforce and hospitals' health and medical records was attributed to poor data security, privacy concerns, legal issues, and the non-availability of network infrastructure (Gathungu, 2018). Confidentiality in the public health sector is seen as vital and a priority due to the effects that breaches, and cybersecurity mishaps will have. Zapata et al. (2021) believe that the confidentiality of data of the health workforce remains at risk due to limited disaggregation of data by the health department. There is a need for continued strengthening of support issues relating to data security in the health sector. The participants made it known that there are policies regarding confidentiality in place to protect the HRIS where the users sign a confidentiality agreement not to disclose any HR information. One major problem is that in some hospitals, manual storage of documents in a cabinet takes place where people can walk in and access the documents easily. This is a potential breach of confidentiality.

Kankaew (2021) believes that HRIS usage should assist to eliminate the manual process of data storage and ensure effective data security during the process of managing workers' personal information. The participants also stated that the employment of casual workers to work on employees' details is also a breach of confidentiality in hospitals. Some of the participants argue that people are resigning due to a lack of effective information systems in place and other personal reasons and do not see how the current HRIS can assist in identifying grounds for their resignation. The system has numerous glitches in the confidentiality of information. A new and upgraded HRIS might help them with the latest technology for more security and confidentiality of information.

Regarding the visits to the HR substructure to have meetings on issues relating to their HR queries, people have to sit in a public space at the HRD to discuss their personal information. An insufficient effort is made to keep confidential people's information, which affects the mindset of the skilled workers involved, and impacts the retention and sustainability of the workforce. A new system to allow everyone access will assist in eliminating such problems. Roy (2015) agreed that staff appraisals and other forms of conversation with an employee are supposed to be confidential discussions that will assist in keeping the workers' information personal. For such talks not to be kept confidential can be disadvantageous and be used against the worker, which could impact retention.

7.3.12 Resistance to change

Some of the participants commented on their attitude toward an effective HRIS where workers could have access to capture their HR information. They stated that such a function would add stress to their work schedule because of the enormous workload they were currently facing, and they would not have time to work on the HRIS. Scupola and Pollich (2019) mention that the automation of HRD assists in replacing paperwork and, at the same time, creates challenges for a new HRIS in an organisation, where managers are frustrated with extra administrative tasks and the employees' need for guidance and motivation to adapt to the new system.

The workload would limit the use of an HRIS in the public health sector, where the shortage of skilled workers has caused an increase in workload. Some of the participants were not in favour of an upgrade of the HRIS that would allow them access because they believed it would increase their workload, and they would not have enough time to work on the system and do other work outside their primary duties. Iwu, et al. (2012) mention that extra workload does have a negative impact on the workers' performance when they are expected to perform other functions outside their regular work schedule. These situations bring about stress, employee shortages, and unsafe working conditions, as well as attribution to resistance to change.

The lack of government encouragement to use the HRIS for service delivery was also part of the unwillingness and resistance to change from the old to a new HRIS to compete with HICs and improve service delivery. Al Shikhy et al. (2019:566) contend that the strategic objective of using an HRIS is to strengthen practical government support for effective administration using effective technology. Such an achievement will need a change in attitude towards accepting new technologies.

The keywords/themes discussed in section 7.3 emerged from the data analysis and patterns that were formed and emerged through linking different questions that revealed similar meanings and interpretations from the findings.

7.4   JUSTIFICATION OF RESEARCH FINDINGS

This study followed a pragmatic approach, and the findings from the study are inferred from existing theories and constructed in the literature. Saldana (2009) mentioned that creating an unusual theory is not always necessary to derive an outcome from mixed method research, but acknowledging that existing theories can be combined to establish a unique theory. The underpinning frameworks adopted in this study were used to validate some of the findings and

similar models to accommodate the entire investigation. Muinga et al. (2020) mention that in mixed method research, efforts should be made to substantiate the findings from a study with valid facts and existing theories to explain the implication of the findings from the study. Muinga et al. (2020) further point out that to ensure a study's validity, a theoretical sensitivity must be established in terms of which the mixed methods used must follow a set of procedures to increase the quality of the results obtained from the study. Mburu (2015:13) emphasises that the theoretical orientation is the intimate connection with empirical reality that permits a change of testable, relevant and valid theory.

7.4.1   Proposition of findings with the framework

The findings of this study highlight the following factors related to the effective utilisation of HRIS in the health sector in SA. These factors also complement the theory on innovation diffusion in HRIS by Kassim et al. (2012) (see Section 4.8.1.2, Figure 4.3) and the knowledge-based theory for HRISs by Beulen (2009) (see Section 4.8.2.5, Figure 4.4).

The Technology, Organisation and Environment (TOE) framework for HRIS by Alam et al. (2016) (see Section 4.8.3.1, Figure 4.5) was also adopted together with the theories mentioned in section 7.3 to provide support for some evolving findings in the study.

The TOE framework was adopted together with innovation diffusion theory and knowledge-based theory to accommodate the crucial findings from the study, and then derived a framework on effective HRIS in the health sector.

7.5   THE FRAMEWORK

Figure 7.2 indicates an extension of the proposed framework (Figure 4.6) adapted from Technology, Organisation and Environment (TOE) framework, innovation diffusion theory and knowledge-based theory, and in conjunction with the study findings.
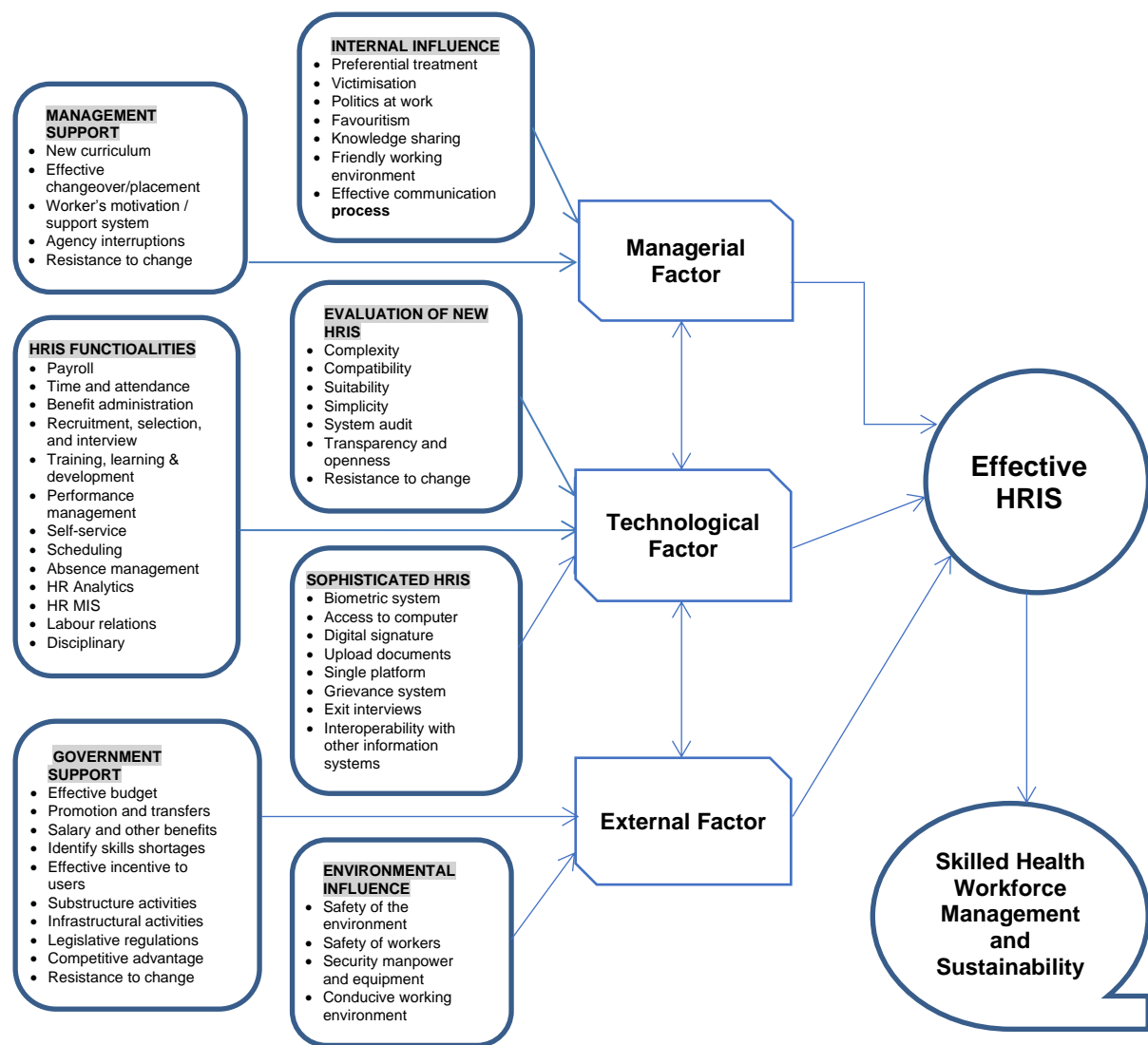
Figure 7.2: The Managerial, Technological and External (MTE) factors framework for effective utilisation of HRIS.
Compiled by the researcher

Figure 7.2 is a Managerial, Technological and External (MTE) factors framework for effective utilisation of HRIS developed from this study. It highlights the fusion of three identified factors known as: i) managerial, ii) technological, and iii) external factors and their engagement towards a sustainable skilled health workforce management in the public health sector through an effective HRIS.

The explanation of the MTE factors framework is following:

7.5.1   Explanation of the framework

7.5.1.1   Managerial factors emerged from the research findings

Managerial factors, made up of internal influence and management support are itemised as follows:

7.5.1.1.1   Internal influence

- **Preferential treatment:** This is when people are treated much better than others in an organisation with no information systems to monitor individual workers and their performance. An effective IS such as HRIS will give everyone equal opportunities.

- **Victimisation:** An effective IS will assist the internal process in scrutinising alleged victimisation in public healthcare settings. This can be done by eliminating blame on HRIS users and other information systems users for defective systems in place.

- **Politics at work:** A situation where some workers make malicious moves against their fellow workers and put those workers in work-related trouble with the management. An effective HRIS will monitor the skilled workers and their activities towards their fellow workers. An effective HRIS will also assist to identify workers who are taking advantage of their fellow workers.

- **Favouritism:** A situation where people are favoured more than others in terms of promotions, positions, and work schedules, amongst others. The managers choose those who will be favoured in the workplace. An effective HRIS will assist in doing away with favouritism in the public healthcare sector.

- **Knowledge sharing:** The need to have an IS such as HRIS that will enable the workers to share their knowledge is important for continuity. Better performance of services in the public health sector is important for record purposes.

- **Effective communication process:** An effective HRIS in place will assist in a smooth and effective communication process among the skilled workers rather than manual forms of communication, including the use of tablets, cell phones, and other technology sources to communicate.

- **Friendly working environment:** IS availability can create a pleasant working environment within the public health sector with a huge workload and a high rate of patients to attend to at every given point in time. The HRIS will make the environment bearable and convenient for skilled workers in dealing with their patients.

- **Resistance to change:** The workers' willingness to accept the effectiveness of HRIS in the public health sector is important because some of the skilled workers still prefer the old, primitive, and manual methods they are used to, which is detrimental to having an effective system in place.

7.5.1.1.2   Management support

- **Further study:** IS availability can assist professional development by allowing nurses and other skilled health professionals to further their studies through study leave and come back afterwards to resume their jobs. Such a process can be implemented through the HRIS.

- **Effective changeover/placement:** An effective IS in place can assist the management in an effective changeover of workers from one department to another, rather than a manual process of making such decisions. Also, placing people in the correct positions should be affected through the HRIS.

- **Workers' motivation/support system:** An effective worker motivation and support system in the public health sector is critical and can be achieved with an effective HRIS where motivation and support strategies can be automated and properly controlled.

- **Agency interruptions:** The public health sector employs many locums, casual workers, and other agency staff. Sometimes there is a need to use permanent workers for overtime and to convert locums and other skilled agency workers to fill vacant permanent positions. This issue needs to be monitored and controlled through an HRIS. A sound control system would enable the management to know when there is a need to employ casual workers.

- **Resistance to change:** The management needs to be ready to accept changes in the system through an effective HRIS to assist in changing the whole management process from manual to automated operation of an effective health system that will assist in retaining skilled workers.

7.5.1.2   Technological factors emerged from the research findings

Technological factors, made up of sophisticated HRIS and HRIS functionalities for the health sector are itemised as follows:

7.5.1.2.1   Sophisticated HRIS

- **Biometric system:** The need for the latest technology introduced biometric solutions in organisations. This need is to recognise workers through a unique technological mode such as fingerprints and facial recognition amongst others. A sophisticated HRIS is needed to have such technology in place.

- **Access to computers:** Implantation of an effective HRIS will convert the use of DOS and primitive technology to Windows-based and other contemporary operating systems with the help of computers and other forms of technology such as cell phones, laptops, and desktops, for competitive and advanced technology

- **Digital signature:** Effective HRIS can assist with the use of digital signatures for authentication of security and integrity of workers' details in the public health sector. This will assist to eliminate manual signatures and documentation.

- **Uploading of documents:** A sophisticated IS utilisation will be effective in the process of uploading documents into the HRIS or other system rather than sending documents manually through the HR person to the HR department and management, which will go a long way in implementing an effective health system and eliminate loss in transit and duplication.

- **Single platform:** The idea of converting the IS used in the public health sector to a single platform offering easy access to all skilled workers will be an advantage for a sustainable healthcare strategy.

- **Grievance system:** An effective HRIS can contribute to giving skilled workers access to communication with the HRD and management on issues that are work-related or personal, and prevent unfair treatment in the workplace, which will require urgent attention by the authorities. Such an IS needs to be a priority for confidentiality and a sustainable health workforce.

- **Exit interviews:** the hospitals need to have the exit interviews captured on HRIS to assist the authorities in identifying reasons why skilled health workers are resigning and in monitoring the resignation statistics through the system.

- **Interoperability with other information systems:** Effective HRIS in the public health sector needs to interrelate with other information systems to eliminate duplication or repetition and misplacement of documents and knowledge required to maintain the public health workforce.

7.5.1.2.2   HRIS functionalities for the health sector

- **Payroll:** The major reason why HRIS was acquired and used by organisations is for payroll administration. Not making use of payroll functionality in the HRIS will be a wasteful acquisition. It is expected to be in use, but the sophistication of the HRIS is an important aspect of the system used to eliminate manual and other forms of interventions.

- **Time and attendance:** An effective HRIS will require the use of biometric solutions in the HRIS to conduct time and attendance monitoring through fingerprint recognition, facial recognition, or ID card readers, amongst others, as against the current manual system of attendance registers.

- **Benefits administration:** HRIS will be able to assist in accurate records of long service awards, pension funds and other benefits. This will help in producing immediately available and correct information.

- **Recruitment, selection, and interviews:** the HRIS should have a single platform for recruitment, selection, and interviews all in one place; people could then make online applications for work through the platform, get responses, and take part in digital interviews before the final candidates are invited for face-to-face meetings.

- **Training, learning and workforce development:** HRIS needs to also have a single platform for training, learning and workforce development for monitoring and recording purposes, and identify the trained skilled workers and those eligible for training in the public health sector. This will eliminate the manual process of people applying individually for training which has to go through a discriminative process.

- **Performance management system:** This is also known as the SPMS in the public health sector of SA. The public health sector uses the PERMIS for SPMS, which is not interoperable with PERSAL. This defeats the objective of performance appraisals through the HRIS for effective monitoring and managing of a skilled workforce for healthcare sustainability purposes.

- **Self-service:** An HRIS, to be strategically aligned, needs to allow skilled workers access to the electronic self-service (ESS) functionality to capture their leave, addresses, marital status, change of name/surname, relative details, login complaints and queries; then their managers can have access through the MSS functionality for approvals of that information captured through the ESS. This will assist in eliminating

delays, loss of documents and other HR-related problems caused by lack of access and frequent visits to the substructure.

- **Scheduling:** HRIS can be used for work schedules and time slots of skilled workers' information to be captured immediately to eliminate misappropriations and errors and easily identify people that are not working in their time slots.

- **Absence management:** HRIS can assist in the automation of allocation, booking, tracking, and monitoring absenteeism, leave documents and processes to ensure accurate, consistent and on-time records.

- **HR Analytics:** HRIS can also assist in using data and reports derived from the system to make strategic and viable decisions that will assist in the effective monitoring and management of the skilled health workforce for sustainability purposes. Reports on turnover rates are derived through the analytics functionality for the accuracy of information.

- **HR MIS:** HRIS, to be effective, needs to have an HR MIS to efficiently manage the employment history of all the employees in the public health sector, from their first day of employment to the day of retirement, even if they migrate to other sectors/organisations or countries to work.

- **Labour relations:** HRIS can assist the public health sector to have efficient labour relations, policies, and procedures used to process matters relating to employee relations and trade union issues to help skilled workers to deal with such issues through the HRIS.

- **Disciplinary:** Functionality for disciplinary procedures is required in the HRIS to capture disciplinary actions taken upon any employee for effective record purposes and future references. This will assist the public health sector to have a structure in place for discipline in the workplace.

7.5.1.3 External factors emerging from the research findings

The external factors, made up of environmental influence and government support are explained as follows:

7.5.1.3.1 Environmental influence

- **Safety of the environment:** The lack of safety of the environment affects the technological accessories installations and implementations in public hospitals. The lack of a safe environment will warrant that computers and other IT devices might be at risk.

- **Safety of the workers:** The worker's safety is an external factor that requires attention; skilled workers might be at risk of being robbed on their way to work or even at the workplace, thereby losing their technological devices used in the workplace to access HRIS, clinical and other information systems.

- **Security manpower and equipment:** The presence of security manpower and equipment to safeguard the hospitals, workers and patients is critical. They need to have the presence of heavily armed security to protect the hospitals, skilled workers, and patients for the sustainability of the public health sector.

- **Conducive working environment:** The environment must be conducive for skilled workers to feel free to work on the HRIS and other information systems without fear or doubt in their minds and give them the confidence to improve the services they render to the public.

7.5.1.3.2   Government support

- **Effective budget:** Deployment of effective budget allocation to support the improvement of HRIS and other information systems is important to effective retention and service delivery in the public health sector.

- **Promotion and transfers:** The government needs to assist in implementing promotion and transfers of the skilled health workforce, through the HRIS or other IS rather than people resigning and re-applying afresh for promotions and new positions.

- **Salary and other benefits:** The government should implement the use of an HRIS or other IS to effect salary adjustments and other benefits rather than manual intervention

- **Identify skills gaps:** The government needs to participate fully in using HRIS or other IS to quickly identify when there are skills gaps in the public health sector rather than identifying skills gaps through a manual system.

- **Effective incentives to users:** The presence of incentives for skilled healthcare workers who put extra effort to work and have time to access other IS such as HRIS is important for motivation purposes.

- **Substructure activities:** The government needs to support effective IT structures in the various hospitals and make them independent in running their HR and finance activities. This approach would eliminate substructure visits and manual interventions by having HRD and access to HRIS in all the hospitals with over 100 workers.

- **Infrastructural activities:** The government should support the improvement in infrastructure around the entire public health sector for effective HRIS, and other IS usage, with an increase in the number of rooms available to create a space for computers and other IT installation to allow the entire skilled workers access to HRIS and other IS.

- **Legislative compliance:** The government needs to introduce legislative compliance on the effective use of HRIS and access for all skilled workers to improve their working relationships with the HRD and management. Also, to formulate policies that will encourage the use of HRIS for effective management of skilled health workers.

- **Competitive advantage:** HRIS will assist the public health sector in making strategic decisions. Such decisions will put them at the level of competing with the private health sector and HIC health sectors.

- **Resistance to change:** The government need to seriously be part of the change process to support the effective use of HRIS, and other information systems that will bring the public health sector to a different level of service delivery.

7.5.1.4 Factors that contribute to the adoption of a new HRIS in the health sector

Other factors that can support the technological advancement of the health sector include the evaluation of a new HRIS. This is itemised as follows:

7.5.1.4.1   Evaluation of a new HRIS in the health sector

- **Complexity:** Effective HRIS eliminates complex, and difficulty of the system used in the public health sector; people need to be educated and knowledgeable about the system and how it works.

- **Compatibility:** A sophisticated HRIS needs to be compatible with existing systems for effective integration of the public health sector delivery services.

- **Suitability:** A sophisticated HRIS needs to be suitable for public health sector workforce monitoring, management, and retention.

- **Security:** Security of information in the HRIS is a significant concern; primitive and manual systems are usually prone to security breaches. A sophisticated HRIS will give better security guidance and secure confidentiality of skilled workers' details.

- **Simplicity:** A sophisticated HRIS requires to be easily accessed by skilled workers, and even the lowest levels of skilled workers need to be educated and trained regularly on how to make use of the system.

- **Accessibility:** The HRIS must be accessible by the entire workforce to capture their HR information and documents rather than submitting them manually to the HRD for capturing on the system.

- **Capability:** The HRIS must be able to handle different functions of HR management processes efficiently within the public health sector, a system that could ensure that skilled capable hands are employed and available to operate and manage the sector properly.

- **Transparency and openness:** The HRIS need to be transparent and open for everyone to have an idea of what goes on in the system and how the system can assist them in performing effective services and how such services could impact the sustenance of the sector.

- **External audit on HRIS:** It is necessary to have external auditors conduct periodic and physical system audits on the HRIS to make sure that the system is used for its purpose. Also, to make sure that information captured and retrieved is accurate and timely because, currently, only the reports generated from HRIS are audited which might not be objective and strategic.

- **Resistance to change:** There is a need for change facilitation in the acceptance of new HRIS technology in the public health sector. Such a change process would assist in the improvement of the health system workforce and sustainability.

The above information is grouped according to the MTE factors framework for effective HRIS for sustainability and retention in the public health sector. The framework is built on the concepts and constructs rising from the interview and survey findings in relation to the existing

literature. Factors are considered within and outside the public health sector that drives the intention to utilise a successful HRIS. Figure 7.2 shows the factors as: i) managerial, which comprises management support and internal influence, ii) technological, which comprises sophisticated HRIS and HRIS functionalities, iii) external, which comprise government support and environmental influence, and iv) the evaluation of a new HRIS. These factors are identified and considered as influencing the effective use of an HRIS in the public health sector for the benefits of retention and sustainability of the skilled workforce for healthcare service delivery.

7.6   CHAPTER SUMMARY

This chapter discussed the analysed findings from the previous chapter along with the keywords/themes that stood out in the analysis of the findings. The keywords/themes that emerged include primitive system, manual intervention, basic administration of information, access to computers and other devices, availability of funds/budget, infrastructural challenges, centralised system, sophisticated system, the timelessness of information, substructural challenges, the confidentiality of information and resistance to change.

Lack of information and knowledge of HRIS, lack of sophisticated HRIS, lack of access for the entire skilled health workers, and lack of a single platform of HRIS and IS where significant reasons for ineffective HRIS usage in the public health sector. Also, the government's lack of awareness and support for HRIS utilisation for technological advances was identified. There is a need to improve the HRIS and other technological infrastructure with government policy and legislation to support the public health sector in eliminating stress related to health workforce sustainability.

There is a reasonable understanding of the importance and a need for evaluation of a new HRIS in the public health sector, emphasising the need for the effective use of the required HRIS functionalities. Most of the participants acknowledged the need to align the public health sector needs and HRIS functionalities to ensure suitable IT infrastructure for skilled health workforce development processes and make strategic decisions for the sustainability of the workforce.

This study also established the effective use of HRIS technology which should play a vital role in the ability of the public health sector to leverage incremental changes to ensure survival in competitive market structures. The findings revealed the factors of a sophisticated HRIS technology utilisation for skilled health workforce retention and sustainability and service

delivery, which were mapped out from three existing theories and frameworks to ensure validity and verifiability of the findings from the study by developing an MTE factors framework for effective utilisation of HRIS.

The next chapter focuses on the conclusions and recommendations of the study.

CHAPTER EIGHT: CONCLUSIONS AND RECOMMENDATIONS

Chapter Eight – CONCLUSIONS AND RECOMMENDATIONS
Introduction
Conclusions
Proposed guidelines for an effective HRIS
Recommendations
Limitations to the study
Future studies
Chapter summary
Summary of the chapters
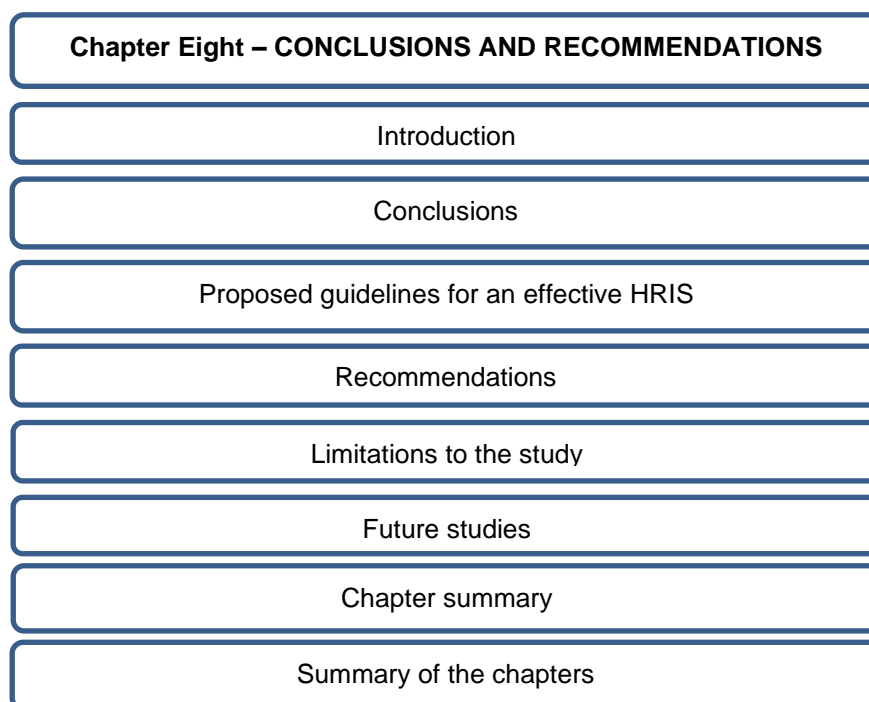
Figure 8.1: Layout of Chapter 8

8.1   INTRODUCTION

Despite the countless efforts of renowned scholars, dedicated intellectuals, and enthusiastic academics, the slow pace of upgraded and sophisticated HRIS use in organisations and the public health sector remains prevalent. Numerous studies have been conducted over the years to explore new knowledge on the effective use of HRIS technology. This thesis focuses on an aspect of HRIS uptake lacking in the SA public health sector. The research explores the level of utilisation of HRIS technology in selected public hospitals in the Western Cape Province of South Africa.

The study reveals various challenges that obstruct the public health system from effectively utilising HRIS technology for a sustainable skilled workforce. The public health sector operates in a complex and complicated environment requiring sharing of knowledge and education about HRIS's potential benefits to the entire public health workforce. This study argues that a lack of adequate information impairs the ability of the government to support and invest enough funds to upgrade HRIS.

The importance of HRIS technology utilisation in the public health sector resonated throughout the study. The potential value of a sophisticated HRIS coupled with the competitive advantage it offers to the public health sector will be crucial to the sustainability of the skilled health workforce. Some of the factors that affect the use of HRIS in the public health sector are lack of sufficient funds, documents lost in transit to the substructure, load shedding, lack of seriousness, and inefficiency. Other factors include delays in response to queries from HRD, lack of staff access to a computer and other IS and workers' ignorance and lack of interest, and lack of qualified staff. These factors are among those highlighted by the participants that affect the use of HRIS in the public health sector of SA.

8.2 CONCLUSIONS

This study set out to explore the effectiveness of HRIS utilisation practices and their issues. In this study, the researcher identified and discussed factors affecting the use of HRIS in the public health sector and how the HRIS impacts the health sector's performance. It also discussed how HRIS could assist in monitoring and managing skilled health workers and HRIS assistance in retaining skilled workers in the public health sector. The role that government plays in using HRIS to improve service delivery, the benefits of using HRIS in the public health sector and how such benefits could impact the sustainability of the skilled health workers were deliberated comprehensively in this study.

8.2.1 Research questions

This research sought to engage with the problem statement that "**HRIS has not been effectively utilised within the public health sector due to inadequate monitoring and management measures for sustainability and retention strategies, including keeping accurate information about the skilled health workforce**". From this problem statement, three research questions were asked to derive the answer to this problem statement. In summary, the research questions and their answers follow:

8.2.1.1 *RQ1: What factors hinder the effective utilisation of HRIS within the health sector of South Africa?*

Numerous factors constrain the effective utilisation of HRIS in the South African public health sector, such as manual operation, use of a primitive system, basic salary administration, lack of knowledge and education on HRIS, the human factor, resistance to change, lack of external audits, load shedding, substructural activities, among others. These factors hinder the effective

use of HRIS in the public health sector of SA. For these reasons, the health sector cannot effectively utilise the HRIS to achieve its potential benefits.

8.2.1.2 *RQ2: What impact does HRIS usage have on monitoring and retaining the skilled workforce in the health sector?*

Retention of the skilled health workforce is part of the significant influence of an effective HRIS in the public health sector. Retention is impacted by the lack of access and capturing of all skilled health workforce details in the public health sector; lack of upgrades that would enable all HRIS functionalities; lack of access for all skilled health workers; lack of special incentives to HRIS users; lack of interrelation of the HRIS with other information systems, and the lack of monitoring of salary and benefits of skilled workers through the system. These factors have created a negative impact on the use of HRIS to monitor, manage and retain the skilled health workforce in the public health sector of SA.

8.2.1.3 *RQ3: How can HRIS be utilised to assist the health sector in improving its services to the public?*

Service delivery is one of the main objectives of a sustainable public health sector, and this cannot be attained without the availability of a sufficient skilled workforce. HRIS usage in the health sector is intended to achieve service delivery. An HRIS also needs to assist in monitoring promotions and transfers and to build a single platform of information systems. There need to be sufficient budgets, improved infrastructure and technologies, effective policies, and support strategies. Finally, the HRIS is needed to streamline the HR process. Digitalisation and automation of the system have implications for consistency and for immediate responsiveness of skilled health workforce information through the HRIS. This will assist the health system to accomplish a better future retention strategy.

8.3 PROPOSED GUIDELINES FOR AN EFFECTIVE HRIS

Effective HRIS technology should incorporate key factors such as costs of the upgrade, HRIS functionalities, knowledge, and education of the system, benefits accruable, and the risk associated with the update of the technology, among others. The public health sector is expected to establish relevant evidence that points to the appropriateness of a sophisticated HRIS technology and the effective utilisation as an advantage over the current HRIS (PERSAL), which is still primitive technology. The indication is that a sophisticated HRIS can

be cost-effective and efficient in the long-term as compared to manual and paper-based processes.

Adequate procedures should be followed in successive phases to reduce the risks attached to adopting a sophisticated HRIS. A decision can be made at the end of each upgrade stage on how to proceed to the next stage of the transformation for effective HRIS technology. The guidelines were developed to assist the public health sector in utilising sophisticated HRIS technology for workforce sustainability and retention purposes. Figure 8.1 shows a diagram of the proposed HRIS guidelines.

Figure 8.1: Proposed guidelines for effective HRIS

The guidelines are presented as follows:

8.3.1   Internal guidelines

- Create an opportunity through an IS such as an HRIS to deal with conflicts within the public health sector, assist in monitoring and managing grievances, politics, and favouritism, among others, at the workplace, and give skilled workers the confidence to stay at work.

- Establish a process of knowledge sharing and education through using of information systems and an HRIS among skilled workers to support one another in terms of transfer of knowledge and experience for improvement in the public health sector.

- Create a conducive and effective working environment where there are sufficient rooms/spaces for computers, information systems and an HRIS that skilled workers can access to make their work more convenient with less distraction.

- Establish communication processes through using of an IS or HRIS rather than manual forms of communication in the public health sector.

8.3.2 Management guidelines

- An effective policy is needed to support study leave in the public health sector. This process will allow skilled health workers to further their education and training and still be employed in the sector with or without pay. This policy will encourage retention, skills development, and a sustainable workforce turnover rate.

- Use a single platform IS such as an HRIS for easy access to information in the public health sector.

- Ensure that an effective IS such as an HRIS is used for the changeover process and to position skilled workers in appropriate and comfortable positions at work.

- Management should support skilled healthcare workers by motivating the need for technology improvement for effective HR processes.

- Be willing to accept changes by implementing policies and legislation made by the government to improve the HRIS and other information systems that will improve the public health system.

8.3.3 External guidelines

- A safe environment must be established for sophisticated IS structures to be installed without being tampered with by vagrants.

- Worker safety in the environment is also important, so the hospitals and their workers must be guarded against losing their technological devices and other technologies used to access the HRIS.

- Ensure sufficient security manpower and equipment to guard the hospitals, workers, infrastructure, and patients, and give skilled workers confidence at work.

- There must be access to technologies with potential applications for health services, including using the internet to access the HRIS.

8.3.4 Government guidelines

- Support an effective HRIS through sufficient budgets to improve HRIS technology for sustainability and service delivery in the public health sector.

- Have policies in place to use HRIS to identify people who need to be promoted or transferred within the public health sector.

- Have policies to determine salary structures, adjustments, and other financial benefits through the HRIS for effectiveness and accuracy.

- Institute policies on the use of HRIS to monitor and identify skills gaps and identify the right people to fill vacant positions.

- Support an effective HRIS for skilled workers with easy access through cell phones to eliminate inconvenient visits to the HR substructure.

- Create special incentives to skilled workers to support and motivate access to the HRIS.

- Improve technological and other infrastructure to create a friendly atmosphere for public health sector service delivery.

- Ensure legislative compliance in the use of HRIS to improve working relations between skilled workers, HRD and management.

- Identify skilled health workers as critical staff through various support structures that include technological advances to improve the public health system for competitive advantage.

- Make adequate enquiries from the vendors on the HRISs used in the HICs and other competitors to allow the selection of an appropriate HRIS for an effective public health system.

- Identify government occupational support programmes and technological initiatives for effective Business Process Automation (BPA).

8.3.5 Economic guidelines

- The cost of upgrades or acquisition of new HRIS, maintenance, support, skills improvement, and integration with the current information systems should be considered before making the improvements.

- The licencing options of the sophisticated HRIS, including the subscription fees, number of people to access, the transaction costs, and other additional structures/functionalities, need to be considered.

- The cost of training and improvement in knowledge of all skilled health workers to access and operate the HRIS should also be considered.

- The cost of accessing information for strategic decisions through the HRIS is relevant.

- The benefits that will accrue in terms of value added to the quality of services rendered through using of sophisticated HRIS should be considered.

- Determine the difference between the use of the current HRIS (PERSAL) and the upgraded HRIS in retaining and sustaining the skilled health workforce for effective service delivery in the public health sector.

- Determine the value of acquiring a new HRIS in the market as compared to the upgrading of the existing HRIS and decide which one to choose that will assist in leveraging the technological advances at the right cost for competitive advantage.

- Identify the risk areas in terms of moving information from the existing HRIS (PERSAL) to a new HRIS; the cost of losing some vital information in the process should also be considered.

8.3.6 Technology guidelines

- Identify new functionalities in upgraded HRIS technology that can be added to the current HRIS (Figure 7.2).

- Make sure that the upgrade or acquired HRIS has biometric capabilities; can be used for digital signatures; can upload documents; run on Windows or any other contemporary operating system with the latest technology and eliminate manual systems in HRIS.

- Having a functional HRIS to allow workers to log complaints and grievances and get rapid feedback through the system will go a long way to assist in retaining skilled health workers.

- Use HRIS or other information systems to allow skilled health workers to interact officially among themselves from any location to eliminate face-to-face interactions among the skilled health workers, especially in a pandemic situation.

- Determine the capability of an upgraded new HRIS to handle, prepare and deliver reports at the appropriate time and accurately.

- Determine the capacity of upgraded new HRIS technology to handle the workload and accommodate the skilled workers' demands, which will lead to improving their performance.

- Establish the technical knowledge needed to operate the upgraded or new HRIS technology for optimum output.

- Ensure availability of technological infrastructure to support upgraded HRIS technology.

- Determine the suitability of the new HRIS technology to relate to current challenges of skilled health workforce retention, and to overcome such challenges to ensure future growth.

- There needs to be a test run on the sophisticated HRIS for a while to determine the technological fit and stability for skilled workforce information in the health sector.

There is a need to create transparency and openness in handling workforce-related information to build trust in the reports generated by the HRIS. A periodic external audit of the HRIS is necessary to make sure that the information captured by the workers is accurate, timely, effective, and relevant. Effective confidentiality and security in the HRIS must be ensured through using of unique passwords and the signing of a confidentiality agreement by all the users before access is granted. These guidelines will assist the public health sector to

make better choices and decisions regarding the installation of upgraded HRIS technology in the public health sector of SA.

8.4   RECOMMENDATIONS

Several issues need to be considered and addressed accordingly to improve the effectiveness of HRIS technology in the public health sector of SA. Recommendations were also provided for government policies in terms of support structures and for further studies to be conducted on this topic. The focus of the recommendations is to raise awareness of HRIS usage in the public health sector, and of the need for a standard, sophisticated and upgraded HRIS for a sustainable retention strategy in the sector. The recommendations cover the importance of effective HRIS, government participation in the improvement of information systems and other IT-related infrastructure, support for the workforce, infrastructural improvements, and other support structures to assist in skilled health workforce sustainability.

8.4.1   Effective HRIS Knowledge, awareness and education

The skilled health workforce's knowledge, awareness, and education of HRIS technology were not as expected in the study. Most of the workers in the public health sector of SA are clinical staff and do not have an idea of what goes on in the HRIS and HRD (Scupola & Pullich, 2020:2). This situation made most skilled health workers unaware of how important effective HRIS is to support their work performance. Some of the permanent staff have an idea of the PERSAL system used in the HRD to handle personnel information. But they often do not know that PERSAL is also referred to as HRIS technology that can be used to support their work performance in different ways. Such support can assist them in performing their work functions without interruptions. It is recommended that there should be an education process to create awareness of the HRIS system among the entire skilled workforce, including permanent staff, locums, casual workers, and other agency staff. Also, to educate them on how such a system can assist them in improving their work performance.

8.4.2   Availability of HRD in all the public healthcare facilities

It was observed from the findings that the participating public healthcare hospitals do not have an HRD and do not make use of HRIS. They have one person who does the HR functions manually and sends the documents to the substructure HRD to capture in the HRIS. This process is not efficient and does not assist in improving skilled workforce retention in the public health sector. The public health sector of SA encourages manual interventions in most

HR functions, especially in the hospitals without an HRD, which is more costly and cumbersome to implement than a sophisticated HRIS would be (Suryanarayana & Bhusal, 2019:8). The recommendation is that there must be improvements in all the public healthcare facilities to have similar structural enhancements such as an HRD so that workers do not have to leave work and travel to substructures to resolve their HR-related queries. Such movements do have a negative impact on healthcare functions, affecting the service delivery rendered to the public.

8.4.3 Effective, confidentiality and security of information

The findings indicated the existence of security and confidentiality of information in the HRIS through the use of different levels of passwords to have access for the users and also the signing of confidentiality cause not to disclose HR information without approval. Some of the participants do not trust the confidentiality of their information because of numerous errors and the manual process of dealing with HR functions in some of the hospitals. Also, a situation where casual staffs are employed to handle workers' personnel information is not confidential. The recommendation is that qualified and trained workers should be employed to handle the HR functions and to have an HRIS that workers can access to eliminate manual processes and reduce the workload of the HRD in the public health sector. Confidentiality and security of skilled workers' details are priorities that support the retention of workers.

8.4.4 Effective HRIS functionalities in the public health sector

8.4.4.1 Electronic payroll system

The findings indicated that the public health sector of SA uses the current HRIS (PERSAL) for basic payroll administration and not for a strategic purpose. Also, there is a lack of confidence in the reports generated from the payroll system due to frequent errors and misplacements of documents sent to the HRD. The reason for those misplacements is that there are numerous processes that documents have to go through before they reach the HRD, in which documents can be misplaced or not delivered at the substructure. The recommendation is that they should streamline the HR processes through an effective HRIS to reduce the manual movements of payroll documents and manage every payroll submission by all skilled workers electronically through the HRIS platform.

8.4.4.2 Electronic self-service

The capture and retrieval of workers' information are expected to be accurate and trustworthy for effective decisions concerning the skilled health workforce. PERSAL) is still a DOS version. This version is primitive and does not allow access for all workers through the ESS/MSS functionalities to capture their HR details, and other information such as leave and change of personal details; these could then be followed up or approved by the HRD through the HRIS (Snicker, 2013; Valcik et al., 2021). The recommendation is for effective capture and record-keeping in the HRIS. There should be functionalities such as ESS in the HRIS to allow skilled workers access to capture their HR documents and information. Their managers can use the MSS functionality to log in to view and approve the ESS information and send it to HRD and management for final approvals and implementation. This will assist in capturing and retrieving accurate information in the HRIS for timely and effective decisions by the HRD and management.

8.4.4.3 Electronic recruitment and selection process

Based on the findings, the public health sector of SA conducts the recruitment and selection process manually and not through an HRIS or any other IS, making it challenging to identify the number of people qualified for selection. This is not appropriate because it does not give room for the most qualified people to apply and be selected for work in the public health sector (Jalloh et al., 2015). The recommendation is that the recruitment and selection process be conducted online and through the HRIS. The selected candidates will then be contacted and interviewed through the same system. The final selected candidate can be invited to the office for a face-to-face acquaintance and signing of employment contracts. This process will assist in eliminating double capturing of data and information, inaccuracy, and omission; it will also help allow qualified candidates to be employed.

8.4.4.4 Electronic time and attendance

Time and attendance in the public health sector of SA are recorded manually. They use attendance registers in most hospitals, which is technologically regressive (Subhasree & Srihari, 2018). The recommendation is that time and attendance should be conducted in the HRIS through a biometric system that will include a clocking-in/out system, fingerprint identification, ID card system, and eye recognition system, amongst others. The biometric system will assist in monitoring the attendance, lunch break, tea breaks and all forms of movement of skilled workers in the hospitals. This will help make workers take their work

seriously and not do other things that do not relate to their work. It will also make monitoring workers' movement during working hours through the system easier.

8.4.4.5 *Electronic absence management*

Based on the findings, absence management is currently done manually in the public health sector of SA, where they fill leave papers and other HR-related documents and send them to the HRD, which is also prone to misplacement, and loss in transit or not getting to the HRD on time. The manual process makes it challenging to identify the actual number of outstanding leave days, short hours and leaving early from work (Li et al., 2015:21). The information is usually provided at the end of the year, which affects workers' plans such as holidays, annual leave, and casual leave, amongst others. The recommendation is that absence management information such as leave applications and other forms of absence management processes should be captured on HRIS by the workers and approved by the respected authorities. Still, such capturing and approvals need to be cross-checked by the HRD for accuracy purposes.

8.4.4.6 *Electronic HR analytics*

HR analytics is a strategic process that must be achieved using an HRIS for competitive advantage (Liu et al., 2020). According to the participants, the current HRIS used in the public health sector is for basic administrative HR functions and not for strategic purposes. Also, they do not use HR analytics in the sector because they do not think it is crucial. HR analytics uses statistical reports derived from HRIS to make strategic decisions that will assist in improving workforce turnover rates. The recommendation is that HR analytics should be implemented in an HRIS to help the public health sector achieve strategic advantage of accessing the skilled workforce turnover rate at any given point in time.

8.4.4.7 *Electronic performance appraisal*

Based on the findings, previously performance appraisals used to be conducted manually in the public health sector of SA until 2020; then a system for performance appraisal known as PERMIS was introduced. It was introduced to assist in appraising workers' performance to replace the manual process. Still, PERMIS is not interoperable with PERSAL, which does not assist in effective HRIS functioning. An effective performance appraisal should be conducted through the HRIS, and the government cannot say that they cannot afford to use performance appraisals in the HRIS (Kibria et al., 2021). The recommendation is that performance appraisals should be conducted in the HRIS for proper records of skilled workers'

performance, which will also help identify the skilled workers performing exceptionally well to be compensated accordingly.

8.4.4.8 Electronic job scheduling

It was found that the job scheduling (shift management) of skilled workers is manually conducted in the public health sector of SA and not in an IS such as HRIS. A sophisticated HRIS is expected to have functionalities for job schedules that should be used to manage skilled healthcare workers. The findings indicated that the health sector is one of the busiest sectors in terms of its work functions and its importance to society. A need for an automated job schedule process through HRIS is required to assist in automating the skilled health workers' job schedule in salaries, rather than waiting for documents to be sent through to the substructure for capturing into the HRIS. The manual process of sending documents to the substructure creates stress in the life of the skilled workers because if the documents do not get to the substructure HRD by the cut-off date, they will not be captured in the salary at the appropriate time. The recommendation is that the job schedule should be automated through HRIS for immediate and timely processing of skilled workers' salaries. This will go a long way in eliminating the manual processes of HR systems.

8.4.4.9 Electronic grievance system

Improvement in information and technological access in the public health sector is significant in the current age. In the findings, it was discovered that a fraction of skilled health workers faces numerous problems at the workplace which could make them resign. People always blame poor salaries as the major reason people quit the public health sector, and some people work for their passion and are comfortable with what they earn. The fact is that most skilled health workers face internal problems at the workplace that require attention; most of these problems are not spoken out in the workplace. There are no systems in place to assist in communicating with the people involved on their grievances at the workplace, which is improper. It is recommended that there should be a functionality in the HRIS or IS for all the skilled healthcare workers to take part. Permanent staff, locums, casual workers, contracts and other agency workers should be able to access this functionality to communicate with the HRD and the authorities to discuss the problems they are facing in the workplace to find solutions to such issues (Hosain, 2017). A problem that an employee is going through will often mean that a fraction of the skilled health workforce has similar problems that need to be dealt with in the public health sector. Such a solution could assist in keeping and retaining the most vulnerable skilled workers in the sector.

8.4.4.10 Electronic exit interviews

The public health sector does have a manual process of conducting an exit interview where people are interviewed on reasons why they are resigning. This interview is usually on a face-to-face basis which might be intimidating to the workers, who might then not be able to disclose the reasons why they are leaving (Magdaraog-Jr, 2014). Still, such interviews are not correctly documented in the HRIS and are not used to find solutions to why people resign. The recommendation is that exit interviews be conducted and captured in an automated form through the HRIS. Then a special workforce is appointed to deal with such functions through the HRIS, HRD and management. This process will assist the public health system to find solutions to the resignation of skilled health workers faced by the public health system.

8.4.4.11 Reassigning functionalities

Based on the analysis and discussion of this study, it was noted that in the public health workforce, placements are not monitored and conducted through the HRIS due to government policy that does not allow such a process to take place through the system. Also, the changeover system, which is a process of moving nurses from one department to another within some of the country's hospitals, is not effective as expected due to poor documentation and the lack of an effective HRIS in place. The system is not upgraded for such functions. The recommendation is the introduction of a reassign functionality in the HRIS to allow employees to be reassigned for placements, delegations, designations, confirmations, and changeover, amongst others (Bawontuo et al., 2021). This process will incentivise skilled health workers to remain in the public health system.

8.4.5 Effective policies and regulations to support the use of HRIS in public health sector

8.4.5.1 Policies to automate training and development

Technology has taken on new forms, and things are done differently. In this study, the participants recommended upgrading the HRIS technology, and such upgrades will have to be regular, where the entire skilled workers need to have access and not depend on the HRD to capture their HR information. It is recommended that these technological improvements will require regular training to empower and familiarise all the skilled workers with changes in the HRIS functionalities. The study findings indicated regular training on clinical functions and

systems is conducted to meet up with the regular changes in clinical systems. Such training is not incorporated through the HRIS. Also, the HRIS in use does not assist the public health sector in identifying who is eligible for training. People have to apply for training. This study recommends that all forms of training be incorporated through the HRIS. This should enable the public health sector to identify those trained and those who need to be trained in the sector (Njeje, 2018). It is also recommended that the government should have policies in place that will support the use of HRIS to identify people eligible for training rather than giving people the option to apply for training before they can be allowed to attend. Such a process does have a negative impact on the retention and sustainability of skilled health workers in the public health sector.

In the findings, it was observed that sometimes people are trained at the government's expense, and they are not absorbed back in their job, which is a loss of investment in the public health sector of SA. According to Crush et al. (2019:2), from 2007 to 2013, the South African government's losses amount to USD 1.4 billion in the loss of investment in training. This loss is incurred from the departure of health specialists from SA to Australia, Canada, the USA, and the UK, resulting from a high level of discontentment among the health specialists concerning their work and living conditions in SA. The recommendation is for government to introduce policies that will change such circumstances to keep the skilled health workers that were trained rather than training and losing them to other sectors or HICs.

8.4.5.2 *Policies to electronically identify promotion and transfers*

The findings showed that government policy does not allow the promotion and transfer of skilled health workers to be done automatically and through the HRIS, which has a negative impact on workers' well-being. The policy requires that people need to resign from their current posts and re-apply for other posts or transfer to another hospital in WC or other provinces. This policy is not appropriate because every worker would like to be promoted to a higher level for their effort and be able to apply for transfers to other hospitals or provinces without resigning from their current job, but this is not the case. The recommendation is that there should be government policies that support the use of HRIS to identify those that need to be promoted or transferred within NDHSA, to assist in strategic management decisions on the promotion and transfers of skilled health workers nationwide (Rameshbabu, 2018). This will assist to motivate skilled health workers to remain in their jobs for job security and continuity.

8.4.5.3 *Policies to electronically identify skills gaps and vacant positions*

Skills gaps are not identified through the HRIS of the public health sector of SA, which is also an issue that impacts the sustainability of the skilled health workforce. Skills gaps are identified manually in the hospitals rather than through the HRIS. Vacant positions in public hospitals need to be identified by the HRD through the HRIS for fast and easy workforce replacement through the normal channel of recruitment. However, the findings showed that such a process is taken over by nepotism, preferential treatment, and politics in the workplace. This process could warrant that people with fewer skills be employed to fill the gap of skilled workers (Asamani et al., 2020). The recommendation is that the government should have policies in place to support the use of an HRIS to identify skills gaps and vacant positions, and then advise the management on the qualified candidates to fill the vacant positions either among the permanent, causal workers, locums, contract, agency staff or even outsiders. This process will give everyone the opportunity to apply for jobs in the public health sector without discrimination.

8.4.5.4 *Regulations to electronically determine improvements in salary and other benefits*

The findings showed that salary and benefits adjustments are not determined through an HRIS. It is determined by other factors such as year of service, qualification, and experience. This could be identified through an effective HRIS, but the government regulation does not allow such decisions to be made through an IS such as an HRIS. According to the study, the current HRIS (PERSAL) does not have the requirements to regulate the use of HRIS because of a lack of upgrades and it cannot immediately identify if the details or benefits of an employee need to be updated. Some of the newly employed skilled workers had to wait for months for their salary to be captured based on their current level/position. They even had to keep on visiting the substructure HRD with their nonchalant attitude towards the workers who had to keep on returning for their pay to be corrected. It is recommended that there should be effective government regulations to support the use of HRIS. The regulations should support an automated salary and other benefits adjustments in the public health sector through HRIS. Such adjustments must be timely, accurate, and up to date to allow skilled workers to trust the HRIS reports and focus fully on their primary functions.

8.4.6 Regular HRIS upgrades and updating all skilled health workforce information on the system

The findings noted that the current HRIS (PERSAL) in the public health sector was acquired when it was still a DOS version. Up till this very moment, the system is still a DOS version, not upgraded to the latest technology with biometric functions and an advanced software system. This indicated that the public health sector in SA does not recognise that the skilled health workforce is critical to the sector. The information systems used for clinical functions are upgraded regularly because the hospitals need to have updated systems for their work. However, the IS used to manage the skilled health workers is not updated due to a lack of government recognising the importance of effective information systems to manage the people that perform the clinical functions is unreasonable (WHO, 2021a). It is recommended that the government and management of the public health sector work hand in hand to support the upgrading of the HRIS to the latest technology with biometric systems and Windows or any other operating system to renew the technology used in the public health system. This technological improvement will create a platform for competitive advantage in the health system and more confidence in the workers.

The HRIS used in the public health sector is not used for keeping the record of all skilled workers. Only the permanent workers' records are captured, making it challenging to have conclusive details of all workers in public health. It is recommended that there be an IS to capture the details of the entire skilled health workforce. This should include the locums, casual workers, contract staff, and agency staff. Such a system should be interoperable with HRIS to identify an accurate and comprehensive number of skilled workers in the public health sector for strategic objectives achievement.

8.4.7 Liaising with HRIS users on technological improvement

The findings of this study show that part of the reason for the non-sophistication of HRIS in the public health sector of SA is the government's decision not to recognise skilled health workers as critical. Also, even though there are people in Deputy Director (DD) positions, the study could not establish if they use the HRIS. This situation makes the researcher wonder because the DDs are supposed to know the current state of the HRIS (PERSAL) in use. The government and management are supposed to go to the ground floor of the HRIS users and liaise with them to find out how the system works and what needs to be done to improve the system. The recommendation is that the government implement IT strategies to assist in creating an innovative awareness communication process with the users to be regularly updated on what needs to be done to transform the system for a better workforce in the public health sector. Also, the government needs to introduce a legal identity structure to recognise

the skilled health workers with critical skills by giving them the utmost support in terms of improving structures using technological transformation and financial compensation.

8.4.8 Effective electronic documentation of HR processes

The participants identified lack of documentation of processes as one of the major problems faced in the lack of effective HRIS where an HR employee handles some of the components of some workers in the HRIS. Where staff resigns, there might be a disruption of continuity due to loss of institutional memory. This negatively influences intricate processes where people leave without transfer of knowledge or letting their colleagues gain from their experience. According to Maamari and Osta (2021), there is a need for proper documentation of processes through HRIS for effective systems to be in place. The recommendation is that an effective HRIS should be introduced that can ensure continuity of operations and processes.

8.4.9 Centralised information systems in a single platform

The study indicated that the public health sector of SA does have a centralised system in terms of clinical, HRIS, finance and other functions. Still, it was not effective due to the lack of sophisticated technological infrastructure to support the centralised system. The recommendation is to introduce a centralised system with a single platform of HRIS and other information systems combined for easy access to and operation by all skilled health workers. Then the HRD can do follow-ups on the information captured on the system.

8.4.10 Elimination of manual filing and other HR functions

The study observed that the HR functions of the public health sector of SA are more of a manual intervention in which most hospitals are still filing documents in cabinets that are easily accessed by all workers. Casual workers are employed to work on the permanent worker's personnel documents. Gupta (2013) notes that an HRIS is more effective than a manual system, but because people are resisting change in the public health sector, it becomes a problem that needs to be solved. The recommendation is the effectiveness of HRIS automation where the government, management and health department should support the updating of the system to eliminate the manual HR interventions and be able to compete with other HICs health sector.

8.4.11 Conduct system audits on HRIS and other information systems

From the findings, it was observed that the public health sector of SA has never had an external audit of the HRIS technology in use. Audits are only conducted on reports generated from the HRIS, which are not appropriate. Malpractices might be evident in the HRIS technology, which might not be easily identified in the reports generated. Although such malpractice could be identified, it could take a long time. Further, such malpractices might not be identified and might go on for an extended period. Such malpractices include ghost workers, double salary payments, allowances, leave, and excess availability of leave days, amongst others. Sometimes it could be an error, and sometimes it could be an intentional act where HRIS users could connive with the recipient of payment in return for a percentage of the amount paid into their own accounts (Joseph, 2014:6; Matimbwa & Masue, 2019). The recommendation is that there should be periodic audits by either internal or external agencies on the HRIS technology to make sure that such malpractices are identified before the reports are generated and sent to the authorities.

8.4.12 Expected strategic achievement using HRIS

An effective HRIS is supposed to be used for strategic purposes in most organisations, including the public health sector (Al-Mutawa & Manuel, 2022). From the analysis, it was observed that the current HRIS does not assist in achieving the recruitment, training, reward, and retention strategies due to manual processes, and the lack of sophistication of the system used. This limits the competitiveness of the public health sector, in comparison with other health sectors in the country and outside. The recommendations are as follows.

8.4.12.1 Recruitment strategy

There is a need to accomplish a recruitment strategy, where the public health sector of SA can conduct recruitment online and through the HRIS to allow people from different parts of the country and around the world to access the HRIS, to give them the opportunity to secure employment in the public health sector of SA through online applications and rapid feedback through the system.

8.4.12.2 Training strategy

There is a need to accomplish a training strategy, whereby the public health sector of SA will conduct training of all skilled workers through the HRIS for proper records, documentation, and follow-ups in skills development. Also, workers should not have to apply for training personally.

HRIS should be used to identify those who are eligible for training and to provide training opportunities immediately to eliminate favouritism and politics in the workplace.

8.4.12.3 Reward strategy

This is a process of identifying those with exceptional skills and those who work with passion. An effective HRIS will monitor the work done by every individual, including the permanent staff, locums, casual workers, and agency staff amongst others, and apportion rewards accordingly to motivate the skilled health workers to put more effort into their work.

8.4.12.4 Retention strategy

This is a process of improving retention in the public health sector of SA whereby the authorities upgrade the HRIS to allow skilled workers access to log into the system and submit their queries. This will also allow employees to indicate their problems that need attention in the workplace and in their private life to enable the authorities to introduce a support structure in dealing with such situations. This will assist in retaining skilled health workers for the benefit of the sector in general.

8.4.12.5 Technology strategy

The accomplishment of this strategy requires upgrading the HRIS to assist in maintaining the skilled health workers and the infrastructures available to improve the services rendered for competitive advantage (Troshani et al., 2011; Prasad, 2020). The improvement in technology on HRIS with all the HR functionalities and at the same time making use of those functionalities to eliminate manual processes of HR functions. This will assist in achieving the technological strategic objective.

Based on the study, it was observed that some of the hospitals in the public health sector of SA lack the technological infrastructures to support HRIS improvement, such as lack of computers, load shedding, electricity failures, lack of internet and poor network connections, amongst others. The recommendation is that there should be adequate technological infrastructure to improve, support and assist an effective HRIS and other information systems in the public health sector to build skilled workers' confidence. The technological improvement should include the use of mobile devices and other forms of technology to access the HRIS from any location and at any given point in time to save time, cost and convenience (Defitri et al., 2020).

8.4.12.6 Motivation and incentive strategy

The public health sector of SA is a bustling sector where sick people are taken care of, which makes the entire skilled workforce busy with the workload. Some of the participants believe that they will not have the time to access the HRIS and would need some motivation to include HRIS access into their current work function. The recommendation is that there should be a motivation strategy in the form of special incentives and other forms of motivation to clinical and other skilled workers to persuade them to use the HRIS. This will encourage workers to acknowledge the need to access HRIS and to realise how the system can assist them in their jobs and motivate them to remain at work rather than resign to work elsewhere.

This study also showed that general incentives are determined through performance appraisals yet, not everyone gets such incentives and that demoralise their performance which could also warrant people to resign. A further recommendation is that general incentives will require a policy change as a motivation strategy for such incentives to be implemented across the board in the public health sector of SA. When people do not receive incentives periodically, it can force them to look for better job opportunities. Still, effective HRIS can assist in structuring the incentive processes for workforce retention purposes.

8.4.13 Elimination of HR errors and omissions through HRIS

Effective HRIS can assist in improving skilled workers' performance in the public health sector of SA, where they are allowed to access and capture their HR information and not depend on the HR people. Most of the participants commented that their payslips do have errors and omissions that create frustration and do not allow them to concentrate on their work (Arefin & Hosain, 2019). Such errors and omissions can destabilise the affected workers' expectations of their payrolls that might not come as expected. It is recommended that there should be an effective HRIS that will assist in giving skilled workers a sense of relief in terms of accuracy and confidence in receiving what they expect in their payroll at the end of the month. Such efficiency will allow them to concentrate on their work for the effective performance of their duties and happiness at work.

8.4.14 Effective HRIS in the public health sector of South Africa

From the findings, it was observed that most of the participants, including the HRIS users, are not happy and comfortable with the PERSAL system because of the lack of upgrades since it

was acquired; the system is still lacking in numerous technological advances. The fact that the HRIS cannot assist in identifying, supporting, and even improving the skilled health workers' performance for their efforts does negatively impact their work achievements. It is recommended that the public health sector of SA will need to replace PERSAL. The sector should also eliminate frequent visits to the substructure hospitals' HRD by introducing an automated, sophisticated, biometric system where all skilled health workers can have access to capture their HR documentation, upload documents, sign documents digitally, and then do follow-ups through the HRIS. This process will go a long way to assisting in the sustainability and retention of the skilled health workforce in the public health sector of SA (Wiblen et al., 2010).

8.4.15 Recommendation for the derived framework

The government and management of the public health sector of SA should pay attention to the derived framework. The framework has identified various HRIS functionalities and software developments missing in the public healthcare system used in the study. The framework suggests that the public health system of SA should introduce an effective HRIS that will allow skilled workers access to capture their HR details to eliminate manual interventions. This process will help reduce costs, streamline administrative functions, facilitate technological improvement, and improve retention and service delivery in the sector.

The following serves as essential recommendations for the public health sector in effectively utilising HRIS as a strategic decision tool for skilled workforce management and retention.

- The government must be made aware of the public health sector's challenges in the lack of effective use of HRIS.

- The researcher believes that HRIS should be used as a strategic decision-making tool in automating HRM functions in the public health sector. This tool should record skilled health workers' details, manage time, attendance, absenteeism, recruitment, training, grievance, self-service, performance, analytics, and scheduling, amongst others.

- The developed framework suggests that certain HRIS functionalities have been lacking in the public health sector of SA due to a lack of upgrades and other deficiencies. The system is not effective for strategic decisions that will improve health workforce retention.

- The derived framework is in line with Mbugua's (2015:99) theory, which states that "the use of HRIS should be focused on strategic decisions in organisations for flexible, efficient, oriented, workforce sustainability and service delivery provision".

8.5   LIMITATIONS TO THE STUDY

The hospitals selected for this study are mostly not technology-driven and lack recent technology. It was challenging to engage with skilled health workers with little information on and access to HRIS technology, which is why some of them were unwilling to participate; they were not familiar with the topic and lacked insight and understanding of the study's importance to them. Also, with the spread of the COVID-19 pandemic at the time of data collection, most of the selected participants declined their participation due to the enormous workload and high rate of infected patient admissions in the hospitals. For this reason, it took the researcher one year to collect the data for the study. Several appointments were extended, and some were cancelled, but a saturation level of data collection to enable the study was achieved.

This study was restricted to four selected public hospitals within the WCPDHW of SA. The keywords/themes for discussion were developed from the response derived from the participants in the four selected public hospitals, thereby excluding other hospitals in the WC and SA. The data collection and study were limited to the selected public hospitals and the employees. The study would have been better if there was more representation of hospitals with an HRD in their facilities to give more knowledge of HRIS usage in the public health sector.

The lack of sufficient HR, IT and administrative staff for data collection constituted a significant challenge. Out of the four selected public hospitals, three (DS, ER and RT) had one person (mostly casual workers) who manually dealt with HR functions and then sent the documents to the HRD substructure to capture. Only one of the hospitals selected (MP) had fully-fledged HRD, IT and administration departments. Having more HR, IT and administrative staff participate in the study would have led to more insight into the effectiveness of HRIS usage in the public health sector of SA.

The absence of software to speed up data transcription extended the transcription of 41 interviews to an average of 45 minutes for each transcription. This was a torturous, strenuous, and challenging task for several months. The service of a professional to transcribe and analyse the data was not used because of the sensitivity of the data. The researcher transcribed and analysed the data, and it was reviewed periodically by the main supervisor.

8.6   FUTURE STUDIES

This study can be extended to accommodate further investigation into the circumstances of a new and improved HRIS with a significant emphasis on effective utilisation in general.

8.6.1 Evaluation of the instruments

The literature exposed the lack of effective HRISs, especially in the health industries, to monitor skilled health workers' movements due to the emigration of skilled professionals. An adoption model can be developed to guide the public health system in making informed and justifiable strategic decisions on whether to remain with the existing HRIS (PERSAL) or instead upgrade or acquire a new HRIS to manage the entire skilled health workforce in SA. The selected instrument will be beneficial and favourable to the public health sector and assist in reducing manual complications by having an effective system in place. The selected instrument will also be meaningful in the public health sector because most participants indicate a positive change from the current HRIS (PERSAL) to the latest technology HRIS would be desirable.

8.6.2 Intensification of the study

The unit of analysis of the study does not represent the entire health sector in SA, nor does it include all the categories of the health system. Therefore, the study gives a partial view of HIRS utilisation in the public health system of SA. More studies using an extensive quantitative method to ensure the generalisation of the results in all the regions and provinces of SA will be significant. More focus can be directed at the higher level of hospitals with an HRD. Such levels include: i) district, ii) provincial, iii) specialist, iv) tertiary, and v) substructures amongst others. The above-mentioned hospitals were lacking during this study. The higher-level hospitals were excluded from this study due to the delimitation of the study and should be included in further studies on the effectiveness and adoption dynamics to be in line with sustainable development in the healthcare system.

8.6.3 Re-evaluation of policies

Government policies on several issues that are needed to support the initiatives of technology and IS accessibility, integration, knowledge, awareness, education, the infrastructure, amongst others, should be addressed extensively in the public health system. The lack of support policies is evidence of serious concern for effective HRIS as it affects the capacity to manage, monitor and retain the skilled health workforce for healthcare sustainability. The government needs to re-examine its policies concerning improving technological structures in the public health sector by adopting similar HRIS usage models to those used in high-income countries. Such a change would create an enabling workforce environment for skilled healthcare workers and empower them to access the new technology rather than doing things manually. Further

studies could also investigate the existing policies on public health workforce sustainability through technology empowerment, implementation, acceptance, assessment, and endorsement to identify where they can make adjustments to suit their operation.

8.6.4   Practical experience

The framework developed for the study should be critically engaged in similar contexts to establish its fitness in other regions, provinces, and countries. The proposed guidelines should be tested to determine the level of application of the practical experience of effective and sophisticated HRIS technology in the public health sector of SA. Its usefulness in a real-life environment should be applied in different organisations to determine if the problems of manual HR interventions, ineffective systems, and poor incentives to name a few, are generic to other sectors of the economy.

8.6.5   Location of the selected public hospitals

The location of most of the selected hospitals, for example, within the Cape Flats (gang-ridden community), is a source of dissatisfaction; hence the brain drains experienced in those hospitals. This situation would perhaps be considered for further study to find out the relationship between the location of the hospitals and HRIS and their impact on skilled health workforce sustainability.

8.6.6   Gender equality representation in the health sector management

It was observed in the study that most of the participants were female (75%). 83% of the entire participants are healthcare workers. This is an indication that there is a high rate of concentration of women in the public health sector which requires further studies for comprehensive structuring of the public sector management system to accommodate more women in the authorities (Madichie & Nyakang'o, 2016). This would assist in the gender balance in the management of the sector (Madichie, 2013; Taiwo, Oyekenu, Ekeh, Dey & Raj, 2022). It will also assist in the appointment of suitable and experienced people in making decisions that will improve the use of information systems for organisational sustainability.

8.7   CHAPTER SUMMARY

The study aimed to explore and understand the use of HRIS and the factors that prevent the effective use of such information systems in the public health sector of the WC and SA. A

further aim was to develop a theory that guides the use of HRIS for a skilled workforce retention strategy and management support in a complex healthcare environment.

The aim was achieved using a multiple case and survey research strategy, with a mixed method approach including qualitative and quantitative methods. A literature review was also utilized to identify past studies concerning HRIS. The data were collected through a semi-structured interview schedule and a Likert scale questionnaire. The data were analysed through ATLAS.ti and SPSS. The evidence was described following the sources of data collected. The results were discussed in terms of a framework as a combination of two existing theories and one framework identified in the literature and integrated with the findings of the study. They were further used as a base for proposed guidelines to assist in effectively utilising HRIS technology in the public health sector of SA.

The first objective of this study was to determine significant reasons for the ineffective use of HRIS within the health sector. The study found that the public health sector considers reasons such as lack of awareness and knowledge on the existence of HRISs, lack of an HRD and access to HRIS in various health facilities, lack of HRIS software solutions and capacity building, human error, lack of computers and infrastructure, manual processes, documents lost in transit to a substructure, load shedding, and lack of qualified staff amongst others as some of the reasons that prevent the effective use of an HRIS in the public health sector. These reasons could be addressed by assessing the future value of the technological improvement in infrastructure and the competitive edge that an HRIS can offer the public health sector to ensure the sustainability of the sector in the long-term.

Adjunct to the first objective was to understand how HRIS could impact the performance of the health sector. This study argues that this process requires a development plan to assist in aligning workers' and organisation strategic alliances using HRIS for effective data capture, record-keeping, and retrieval for the decision-making process. The fact remains that HRIS usage is much better when compared to the manual system. However, lack of HRIS system upgrading, poor supervision, lack of special incentives, and unreliable and inaccurate report generation caused by a paper-based system warrant a sophisticated HRIS to achieve healthcare performance.

This study also set out to identify the different ways that HRIS could be used to monitor and control the activities of the skilled health workforce. This researcher argues that the public health sector relies on the effective use of HRIS technology as an enabler of efficiency and productivity. Most of the participants acknowledge the importance of a sophisticated HRIS and its effect on monitoring and managing the skilled health workforce. Unfortunately, evidence

showed that the current HRIS (PERSAL) was not correctly structured to retain skilled personnel due to a lack of upgrades. Not all employees' details are captured on the HRIS, making monitoring skilled health workers through HRIS difficult. Also, not having all the HR functionalities in the HRIS and not having functionality that can be used as a communication network between workers, HRD and management created difficulties in dealing with grievances and other issues (personal and work-related) that affect workers. Also, the lack of management support structures to handle such problems through an IS such as HRIS, prevents achieving the expected objective.

Another crucial objective was to establish how HRIS could assist the public health sector in retaining the skilled workforce. PERSAL does not help in skilled health workers' retention due to a lack of follow-ups in the work process. Lack of proper records, lack of evidence and intricate process of work done by previous HR staff, lack of modification, not being able to identify skills gaps, lack of interrelation with other information systems, not assisting in promotion and transfers, amongst others, are other reasons for HRIS (PERSAL) not contributing towards the objective of skilled workforce retention. There is a need for more consistency to be reached. All the public health facilities can have similar structures in terms of technological modifications, intricate processes put in place, and numerous online and automated HRIS processes to achieve the set objectives.

A further objective was to explore how the government can support the use of HRIS towards improving service delivery in the public health sector. In this regard, this study notes that the use of HRIS towards improving service delivery is a strategic exercise that needs to be achieved in the public health sector. However, the government does not assist in putting in place the requirements necessary to regulate an effective HRIS due to a lack of upgrades, lack of IT strategies, lack of innovative awareness, and sufficient budgets, amongst others. The government needs to develop innovative technological strategies for a sophisticated HRIS and the electronic performance of all HR functions in assisting the healthcare workforce to eliminate manual and unreliable conduct of any form of HR functionalities. Also, the government needs to have effective regulations that will allow HRIS to conduct promotions, transfers, and placement of employees in the public health sector for effective, efficient service delivery.

Lastly, a further objective was to determine the benefits of effective HRIS in the public health sector for service delivery. The benefits of HRIS in the public health sector were identified, especially in the sophistication of technological infrastructure, yet it has not been effective in the sector. It was observed that the benefits of HRIS in promoting the development, sustainability, retention, and service delivery in the public health sector of SA are yet to be

identified. This is due to the lack of satisfaction, lack of communication, lack of effective policies to support HRIS, and lack of HRIS interaction with other information systems. To achieve the expected benefits, such as eliminating backlogs, reducing frustration, and capturing of information, and allowing outsider's access to recruitment and selection online, workers must have HRIS access to submit documents and log in queries and follow-up on the system to streamline HRD processes. These benefits could be achievable with effective policies and strategies for sustainability and efficiency in the public health sector.

The findings offered a new perception of reasons related to the effectiveness of a sophisticated HRIS ranging from the availability of sufficient technology, knowledge and awareness, access, functionalities, regulations, policies, strategies, compensation, performance, and sustainability. In providing an answer to the research problem – "**HRIS has not been effectively utilised within the public health sector owing to inadequate monitoring and management measures for sustainability and retention strategies including keeping accurate information about the skilled health workforce**" – the study concludes that the government needs to understand the potential benefits of an effective HRIS in the public health sector. Having an effective technological system will enable the government to seek information, knowledge, and management from an improved HRIS for sustainable retention and service delivery. The government can also be guided through the evaluative processes of this study that identify various factors related to HRIS technology as it affects the public health sector and workforce retention.

8.8 SUMMARY OF THE CHAPTERS.

Chapter One introduced the research problem, the research background, the problem statement, the research and sub-research questions, and the objectives. A brief account of the systematic literature review, research design, and methodology was also presented. The contribution of the study was discussed, as were its ethical considerations, delineation, aim, and significance.

Chapters Two, Three, and Four presented an in-depth literature review of other research on HRM, HRIS, HIS and technologies concerning the health sector. The factors, challenges, and causes that affect the use of HRIS technology in the health sector were identified. Gaps in technology utilisation and workforce sustainability in the health sector were also emphasised. A theoretical framework related to HRIS technology utilisation and adoption was also identified to assist the researcher to analyse HRIS utilisation in the health sector for management and retention purposes.

Chapter Five presented the research design and methodology of the study. The philosophical foundations, research design, research methodology, research approach, data collection, research strategy, data analysis, validity and reliability, ethics, and delineation of the study were all highlighted comprehensively in this chapter.

Chapter Six discussed the selected hospitals that participated, together with the purposively selected sample. The findings that emerged from both questionnaires and interviews were analysed and presented in this chapter, and the findings from both methods were synchronised for the proper flow of the discussion in the next chapter.

Chapter Seven analysed the findings in relation to the literature and sub-research questions. This discussion further provided answers to the research questions. The discussion of findings also referred to the theories and framework identified in chapter four, and then combined them with the findings to develop an MTE factors framework for the study.

Chapter Eight presented the conclusion and recommendations based on the research objectives. The limitations and possible future studies were presented in this chapter. Finally, a summary of the thesis was provided, and possibilities for further research on the topic were explained.

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Appendix A: SEMI-STRUCTURED INTERVIEW GUIDE

Effective utilisation of human resource information systems in the South African health sector

Introductory remarks: In this global economy, to achieve success, improvement, competitiveness, workforce retention and service delivery in the health sector, a Human Resource Information System (HRIS) is one of the major contributors. This study will investigate the effective utilisation of HRIS in the public health sector of Western Cape, South Africa.

The aim: The research aims to explore and understand the use of HRIS and factors that prevent the effective use of such IS in the public health sector of the Western Cape, South Africa. A further aim is to develop a theory that may guide the use of HRIS for workforce retention strategy and management support in a complex healthcare environment.

We are kindly requesting answers to the questions listed below. Your answers will be used specifically for this study purposes only and they will be treated with the highest degree of confidentiality and privacy. In addition, participation in this interview is voluntary and allows anonymity as well as autonomy.

Section A: Background information

Name:	Department:
Age:	Highest qualification:
Gender:	How long been working in the hospital:
Title/Position:	Contact details:

Section B: interview Questions

RQ 1: What factors hinder the effective utilisation of HRIS within the health sector of South Africa?
SRQ1.1: What are the reasons for ineffective utilisation of HRIS in the health sector?
Q1.1.1 Do you know what HRIS means and what it is used for? **Comment**:
Q1.1.2 Does your hospital make use of HRIS? If yes, what is the name? If no, why not? **Comment**:
Q1.1.3 Do you know if there is a standard HRIS for the health sector in general? If yes, what is it called? If no, why not? **Comment**:
Q1.1.4 Does your hospital have a separate HR department/group/unit? If yes, how many people make use of HRIS? If no, why not? **Comment**:
Q1.1.5 Does the size of your hospital and its operation determine the effectiveness of HRIS? If yes, why do you say so? If no, why not? **Comment**:
Q1.1.6 Is there effective information security in place to safeguard the HRIS? If yes, what kind of IS? (E.g., software against computer hacking and anti-virus) If no, why not? **Comment**:
Q1.1.7. Has the use of HRIS enable HR Department to perform new or enhanced roles of information brokers and decision enabler in your hospital? If yes, why do you say so? If no, why not? **Comment**:
Q1.1.8 What other factors you can identify to be reasons why HRIS's are not effectively utilised in the health sector? **Comment**:

SRQ1.2 How does HRIS impact on the performance of the health sector?
Q1.2.1 How effective is the capturing, recording and retrieval of information in the HRIS? Explain. **Comment**:
Q1.2.2 Has the presence of the HRIS affected or improved how you discharge your duties? If yes, how? If no, why not? **Comment**:
Q1.2.3 Is there any management incentives and target bonuses given to the HRIS administrators? If yes, what kind of incentive? If no, why not? **Comment**:
Q1.2.4 Is there an effective teamwork and staff participation in your hospital to support the use of the HRIS? If yes, why do you say so? If no, why not? **Comment**:
Q1.2.5 Has the HRIS system been able to provide confidentiality, privacy, and security of personnel information of the health workforce? If yes, how do you know? If no, why not? **Comment**:
Q1.2.6 What other reasons you can identify that deprives the HRIS of effective performance in the health sector? **Comment**:

RQ 2: What impact does HRIS usage have on monitoring and retention of the skilled workforce in the health sector?
SRQ2.1 How can HRIS be used to manage health sector workers?
Q2.1.1 Does the HRIS used to capture data and information of all the employees in your hospital? If yes, list the categories of employees that is captured? If no, which of the categories of employees are not captured and why? (E.g., contract staff) **Comment**:
Q2.1.2 Do all the employees have access to the HRIS? If yes, what level of access? If no, why not? **Comment**:
Q2.1.3 Does your hospital conduct any form of training to equip the users on how to interact with HRIS? If yes, what kind of training? If no, why not? **Comment**:
Q2.1.4 Does the HRIS have the following functionalities: payroll, time and management, benefits administration, HR management information system, recruiting and learning system, performance record, self-service, scheduling, absence management and analytics in the system? If yes, what other HRIS functionalities do you have? If no, why not and what other functionalities do you have? **Comment**:
Q2.1.5 Does all the HRIS functionalities suit the operations of the hospital and assist to identify reasons why the health workforce is reducing in numbers? If yes, how do you know? If no, why not? **Comment**:
Q2.1.6 Does your hospital upgrade the HRIS and Software development? If yes, how often? (E.g., Daily) If no, why not? **Comment**:
Q2.1.7 Are their functionalities in the HRIS were the health workers have access to use to communicate with the HRD and management on any problems they are facing in the workplace? If yes, name them? If no, why not? **Comment**:

SRQ 2.2 How does HRIS assist the health sector to encourage the retention of a skilled workforce?
Q2.2.1 Does the entire health workforce have access to the HRIS anytime they want? If yes, what level of access? If no, why not? **Comment**:
Q2.2.2 What are the challenges that you encounter which could be picked up by HRIS? **Comment**:
Q2.2.3 How do you think HRIS usage can assist the health sector to monitor and manage the health workforce within and outside the public health sector? **Comment**:
Q2.2.4 Is there an IS that allows employees to confidentially interact with the health sector HRD and management of the sector? If yes, what IS? If no, why not? **Comment**:
Q2.2.5 Does the information generated from HRIS assist to decide on the improvement of employee salary and

other benefits?
Comment:
Q2.2.6   Does the health sector have an IS that is used to keep a record of the entire skilled workforce in the Western Province?   If yes, what is the name of the IS, and does the entire health workforce have access to it? If no, why not?
Comment:
Q2.2.7   Does HRIS maintain the relationship among the skilled workforce who registers in a talent management warehouse?   If yes, how do they interact? If no, why not?
Comment:

RQ 3: How can HRIS be utilised to assist the health sector to improve its services to the public?
SRQ 3.1: How can the government support the use of HRIS to improve service delivery in the health sector?
Q3.1.1   Is HRIS represented at the highest level in the provincial and the national health department?   If yes, what positions? If no, why not?
Comment:
Q3.1.2   Does HRIS assist the government to effectively determine who must be promoted or transferred at any given point in time?   If yes, how? If no, why not?
Comment:
Q3.1.3   How does the HRIS assist the government to leverages employee's talent in the right place and at the right time?
Comment:
Q3.1.4   How is HRIS applied in monitoring the activities of the health workforce in the Field/Constituency/Mobile offices?
Comment:
Q3.1.5   Is the HRIS able to contribute to the efficiency and effectiveness of the provincial health departmental activities?   If yes, how? If no, why not?
Comment:
Q3.1.6   Why is Africa still lacking behind with regards to improving and retaining the skilled health workforce?
Comment:
Q3.1.7   What other ways can the government support or facilitate the use of HRIS to improve service delivery in the health sector?
Comment:

SRQ 3.2: What benefits could accrue in the effective use of HRIS in the health sector?
Q3.2.1   Does the HRIS interact and coordinate with other information systems used in the health sector?   If yes, how? If no, why not?
Comment:
Q3.2.2 Does the use HRIS do assist the hospitals to accomplish strategies such as: recruitment, training, development, reward and retention strategies?   If yes, explain, If no, why not?
Comment:
Q3.2.3   Does your hospital have policies in place for effective use of HRIS?   If yes, mention them? If no, why not?
Comment:
Q3.2.4   Are you satisfied with the HRIS, or will you recommend that your hospital should acquire an alternative IS for the effective performance of the HR duties, and why?
Comment:
Q3.2.5   What are the future expectations of the health sector with regards to the effective use of HRIS?
Comment:
Q3.2.6   What other benefits that the health sector could identify that can be achieved in the use of HRIS and why?
Comment:

Thank you for your time and patience in answering these questions. Your contribution is highly appreciated and will be commended.

Appendix B: CLOSED-ENDED QUESTIONNAIRE

Cape Peninsula
University of Technology

Effective utilisation of human resource information systems in the South African health sector

Section A: Background information

Name:	Department:
Age:	Highest qualification:
Gender:	How long been working in the hospital:
Title/Position:	Contact details:

1. Indicate your level of agreement or disagreement on the statements below regarding the factors that affect the use of HRIS in the health sector on a scale of 1 – 5, where: 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree and 5 = strongly agree

RQ 1: What factors hinder the effective utilisation of HRIS within the health sector of South Africa						
RQ1.1: What are the reasons for ineffective utilisation of HRIS in the health sector?						
		1	2	3	4	5
1	I have an idea of what is HRIS means					
2	The hospital makes use of HRIS					
3	I know what HRIS is used for in the hospital					
4	HRIS can help store and retrieve records and information of all the workforce in the health sector					
5	The health sector has a standard HRIS					
6	The hospital has a separate HR department/ group/unit					
7	The HR department have an HRIS that links with the provincial health department					
8	There are reliable internet access and a Local Area Network in the hospital					
9	The size of the hospital and its operation determine the effectiveness of HRIS					
10	There is effective information security in place to safeguard the HRIS					
11	HRIS enables HR Department to perform new or enhanced roles of information brokers and decision enabler in the hospital					
12	Other factors can be identified as reasons for lack of effective use of HRIS in the health sector					

2. Indicate your level of agreement or disagreement on the statements below regarding the HRIS impact on the performance of the health sector on a scale of 1 – 5, where: 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree and 5 = strongly agree

SRQ1.2: How does HRIS impact the performance of the health sector?						
		1	2	3	4	5
13	Capturing, recording and retrieval of information in the HRIS is very effective					
14	The presence of HRIS has helped to improve in the way I discharge my duties					
15	There are management incentives and target bonuses given to the HRIS administrators					
16	There are effective teamwork and staff participation in your hospital to support the use of the HRIS					
17	The use of HRIS has been able to provide confidentiality, privacy, and security of personnel information of the health workforce in the hospital					
18	Clinicians and other health workers are adequately trained to interact with HRIS					
19	There are enough computers to be used by the various					

| | clinicians in my hospital to assess HRIS | | | | | |

3. Indicate your level of agreement or disagreement on the statements below regarding the HRIS usage to the management of health sector workers on a scale of 1 – 5, where: 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree and 5 = strongly agree

	RQ2: What impact does HRIS usage have on monitoring and retention of the skilled workforce in the health sector?					
	SRQ2.1: How can HRIS be used to manage health sector workers?					
		1	**2**	**3**	**4**	**5**
20	HRIS is used to capture data and information of all the employees in the hospital					
21	The Information generated from the HRIS helps the institution decide when training and skill development are necessary					
22	All the employees have access to the HRIS					
23	The hospital conducts training to equip the users on how to interact with HRIS					
24	**HRIS has the following functionalities** Payroll Time management Benefits administration HR management information system Recruiting and learning system Performance record Self-service Scheduling Absence management Analytics					
25	All the HRIS functionalities suit the operations of the hospital and assist to identify reasons why the health workforce is reducing in numbers					
26	The hospital upgrades HRIS and software development regularly					
27	There are functionalities the health workers use in the HRIS to communicate with the HRD and management of the hospital on any problems they are going through that can make them resign					

4. Indicate your level of agreement or disagreement on the statements below regarding the HRIS assistance in the health sector to encourage the retention of the skilled workforce on a scale of 1 – 5, where: 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree and 5 = strongly agree

	SRQ 2.2: How does HRIS assist the health sector to encourage the retention of a skilled workforce?					
		1	**2**	**3**	**4**	**5**
28	The entire health workforce has access to the HRIS anytime they want.					
29	HRIS can identify challenges that could be encountered by the health sector workforce.					
30	HRIS usage can assist the health sector to monitor and manage the health workforce within and outside the public health sector.					
31	There is an IS that allows employees to confidentially interact with the health sector HRD and management of the sector.					
32	The information generated from HRIS assists to decide on the improvement of employee salary and other benefits.					
33	The health sector has an IS that is used to keep a record of the entire skilled workforce in the Western Province.					
34	HRIS maintain a relationship among the skilled workforce who registers in a talent management warehouse.					
35	The infrastructure in my hospital is adequate to facilitate effective use of HRIS.					
36	HRIS eliminates skills gaps across the organisation					

5. Indicate your level of agreement or disagreement on the statements below regarding the government support on the use of HRIS to improve service delivery in the health sector on a scale of 1 – 5, where: 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree and 5 = strongly agree

RQ 3: How can HRIS be utilised to assist the health sector to improve its services to the public?						
SRQ 3.1: How can the government support the use of HRIS to improve service delivery in the health sector?						
		1	2	3	4	5
37	HRIS is represented at the highest level in the provincial and the national health department					
38	HRIS assist the government to effectively determine who must be promoted or transferred at any given point in time					
39	HRIS assist the government to leverage employees' talents in the right place and at the right time					
40	HRIS is used in monitoring the activities of the health workforce in the Field/Constituency/Mobile offices					
41	HRIS can contribute to the efficiency and effectiveness of the provincial health departmental activities					
42	Africa still lacking behind with regards to improving and retaining the skilled health workforce					
43	Government supports and facilitates the use of HRIS to improve service delivery in the health sector					
44	The government has put all the requirements in place to regulate the use of HRIS					

6. Indicate your level of agreement or disagreement on the statements below regarding the benefits that could accrue in the effective use of HRIS in the health sector on a scale of 1 – 5, where: 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree and 5 = strongly agree

SRQ 3.2: What benefits could accrue in the effective use of HRIS in the health sector?						
		1	2	3	4	5
45	The HRIS interacts and coordinates with other ISs used in the health sector					
46	**HRIS assists the hospitals to accomplish strategies such as** Recruitment Training Development Reward Retention					
47	There are policies in place for effective use of the HRIS in your hospital					
48	The HRIS can help in the cost management policies of a hospital.					
49	The HRIS analyses each job position and its job title in an organization and places the right employees					
50	I am satisfied with the HRIS in place					
51	I will recommend that the hospital should acquire an alternative HRIS for the effective performance of my duties					
52	There are future expectations of the health sector with regards to the effective use of HRIS					
53	HRIS assesses the budget of training and development programmes					
54	HRIS is useful in the communication of employee performance results					

Thank you for your time and patience in answering these questions. Your contribution is highly appreciated and will be commended.

Appendix C: INTRODUCTORY LETTER

Cape Peninsula University of Technology

INTRODUCTORY LETTER FOR THE COLLECTION OF RESEARCH DATA

Mr Emmanuel Udekwe is a Registered Student at Cape Peninsula University of Technology.

Degree: PHD in Informatics.

Department: Information Technology.

Student number: 204186951.

Contact details: emmaudekwe@gmail.com and cell number 0833122603.

The Title of This Thesis: Effective utilisation of human resource information systems in the health sector of Western Cape.

The aim of this research: The aim of the research is to explore and understand the use of HRIS and also factors that prevent the effective use of such information systems in the public health sector of the Western Cape, South Africa. A further aim is to develop a theory that may guide the use of HRIS for the workforce retention strategy and management support in a complex healthcare environment.

The Supervisor is Prof Chux Iwu. His email address is iwuc@cput.ac.za and cell number is +27834211210.

In order to meet the requirements of the university's Higher Degrees Committee (HDC) the student must get consent to collect data from organisations which they have identified as potential sources of data.

In this case, the student will use questionnaires and semi-structured interviews to gather the data.

If you agree to this, you are requested to complete the attached form (an electronic version will be made available to you if you so desire) and print it on the provincial health department letterhead.

For further clarification on this matter, please contact either the supervisor identification above or the Faculty Research Committee Secretary (Ms Veda Naidoo) email address is NaidooVE@cput.ac.za and telephone number is +21 469 1012.

Regards

Prof Chux G. Iwu
Supervisor
20th of August, 2019

Appendix D: FACULTY OF INFORMATICS AND DESIGN ETHICS CLEARANCE

Cape Peninsula
University of Technology

P.O. Box 652 • Cape Town 8000 South Africa •Tel: +27 21 469 1012 • Fax +27 21 469 1002
80 Roeland Street, Vredehoek, Cape Town 8001

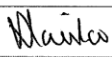| Office of the Research Ethics Committee	Faculty of Informatics and Design

Ethics approval was granted to Mr Emmanuel Udekwe, student number 204186951, for research

activities related to the PhD in Informatics at the Faculty of Informatics and Design, Cape

Peninsula University of Technology (CPUT).

Title of thesis:	Effective utilisation of human resource information systems in the health sector of Western Cape, South Africa

Comments

Research activities are restricted to those details in the research proposal.

Nainbo	12\9\19
Signed: Faculty Research Ethics Committee	Date

RESEARCH ETHICS COMMITTEE
INFORMATICS AND DESIGN
ETHICS APPROVAL GRANTED
1 2 SEP 2019
Cape Peninsula
University of Technology

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Appendix E: UNIVERSITY ETHICS CLEARANCE

Cape Peninsula University of Technology

Office of the Deputy Vice Chancellor:
Research, Technology Innovation & Partnerships
Bellville Campus
P O Box 1906
Bellville 7535
Tel: 021-9596242
Email: SheldonM@cput.ac.za

14 November 2019

Mr Emmanuel Udekwe
Department of Information Technology
Faculty of Informatics & Design
CPUT

Email: emmaudekwe@gmail.com

Dear Mr Udekwe

RE: PERMISSION TO CONDUCT RESEARCH AT CPUT

The Institutional Ethics Committee received your application entitled: "Effective utilisation of human resource information systems in the health sector of Western Cape, South Africa" together with the dossier of supporting documents.

Permission is herewith granted for you to do research at the Cape Peninsula University of Technology.

Wishing you the best in your study.

Sincerely

APPROVED
Chair Senate Ethics Committee

1 4 NOV 2019

Cape Peninsula
University of Technology

Sign: ....

PO Box 1906 Bellville 7535 South Africa
086 123 2788

Appendix F: FACULTY OF HEALTH AND WELLNESS ETHICS CLEARANCE

Cape Peninsula
University of Technology

HEALTH AND WELLNESS SCIENCES RESEARCH ETHICS COMMITTEE (HW-REC)
Registration Number NHREC: REC- 230408-014

P.O. Box 1906 • Bellville 7535 South Africa
Symphony Road Bellville 7535
Tel: +27 21 959 6917
Email: simonsy@cput.ac.za

4 November 2019
REC Approval Reference No:
CPUT/HW-REC 2019/H24

Dear Mr Emmanuel Udekwe

Re: APPLICATION TO THE HW-REC FOR ETHICS CLEARANCE

Approval was granted by the Health and Wellness Sciences-REC to Mr Emmanuel Udekwe for ethical clearance on 4 November 2019. This approval is for research activities related to student research in the Department of Informatics of this Institution.

TITLE: **Effective utilization of human resource information sstems in the health sector of the Western cape, South Africa**

Supervisor: Prof C Iwu and Dr A de la Harpe

Comment:

Approval will not extend beyond 5 November 2020. An extension should be applied for 6 weeks before this expiry date should data collection and use/analysis of data, information and/or samples for this study continue beyond this date.

The investigator(s) should understand the ethical conditions under which they are authorized to carry out this study and they should be compliant to these conditions. It is required that the investigator(s) complete an **annual progress report** that should be submitted to the HWS-REC in December of that particular year, for the HWS-REC to be kept informed of the progress and of any problems you may have encountered.

Kind Regards

Dr. Navindhra Naidoo
Chairperson – Research Ethics Committee
Faculty of Health and Wellness Sciences

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Appendix G: DS HOSPITAL APPROVAL

Western Cape Government
Health

STRATEGY & HEALTH SUPPORT
Health.Research@westerncape.gov.za
tel: +27 21 483 0866: fax: +27 21 483 6058
5th Floor, Norton Rose House,, 8 Riebeek Street, Cape Town, 8001
www.capegateway.gov.za)

REFERENCE: WC_201911_026
ENQUIRIES: Dr Sabela Petros

P O Box 1906
Bellville
7535

For attention: MR Emmanuel Udekwe

Re: Effective Utilization of Human Resource Information Systems in the Health Sector of the Western Cape, South Africa.

Thank you for submitting your proposal to undertake the above-mentioned study. We are pleased to inform you that the department has granted you approval for your research.

Please contact the following people to assist you with any further enquiries in accessing the following sites:

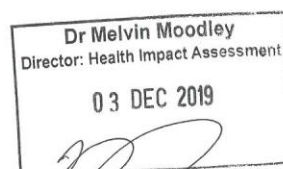| **District 6 CHC** | **Adelein Engelbrecht** | **021 833 5444** |

Kindly ensure that the following are adhered to:

1. Arrangements can be made with managers, providing that normal activities at requested facilities are not interrupted.

2. Researchers, in accessing provincial health facilities, are expressing consent to provide the department with an electronic copy of the final feedback (**annexure 9**) within six months of completion of research. This can be submitted to the provincial Research Co-ordinator (Health.Research@westerncape.gov.za).

3. In the event where the research project goes beyond the *estimated completion* date which was submitted, researchers are expected to complete and submit a progress report (**Annexure 8**) to the provincial Research Co-ordinator (Health.Research@westerncape.gov.za).

4. The reference number above should be quoted in all future correspondence.

Yours sincerely

DR M MOODLEY
DIRECTOR: HEALTH IMPACT ASSESSMENT
DATE:
CC

Dr Melvin Moodley
Director: Health Impact Assessment

0 3 DEC 2019

Appendix H: ER HOSPITAL APPROVAL

Western Cape Government
Health

REFERENCE: WC_201911_026
ENQUIRIES: Dr Sabela Petros

P O Box 1906
Bellville
7535

For attention: MR Emmanuel Udekwe

Re: Effective Utilization of Human Resource Information Systems in the Health Sector of the Western Cape, South Africa.

Thank you for submitting your proposal to undertake the above-mentioned study. We are pleased to inform you that the department has granted you approval for your research.

Please contact the following people to assist you with any further enquiries in accessing the following sites:

Elsies River CHC   **Lorraine Beukes**   **021 931 0213**

Kindly ensure that the following are adhered to:

1. Arrangements can be made with managers, providing that normal activities at requested facilities are not interrupted.

2. Researchers, in accessing provincial health facilities, are expressing consent to provide the department with an electronic copy of the final feedback (**annexure 9**) within six months of completion of research. This can be submitted to the provincial Research Co-ordinator (Health.Research@westerncape.gov.za).

3. In the event where the research project goes beyond the *estimated completion* date which was submitted, researchers are expected to complete and submit a progress report (**Annexure 8**) to the provincial Research Co-ordinator (Health.Research@westerncape.gov.za).

4. The reference number above should be quoted in all future correspondence.

Yours sincerely

DR M MOODLEY   11-12-2019
DIRECTOR: HEALTH IMPACT ASSESSMENT
DATE:
CC

Appendix I: MP HOSPITAL APPROVAL

Western Cape Government

Health

REFERENCE: WC_201911_026
ENQUIRIES: Dr Sabela Petros

P O Box 1906
Bellville
7535

For attention: MR Emmanuel Udekwe

Re: Effective Utilization of Human Resource Information Systems in the Health Sector of the Western Cape, South Africa.

Thank you for submitting your proposal to undertake the above-mentioned study. We are pleased to inform you that the department has granted you approval for your research.

Please contact the following people to assist you with any further enquiries in accessing the following sites:

Mitchells Plain Hospital   **Dr Jacek Marszalek**   **021 377 4782**
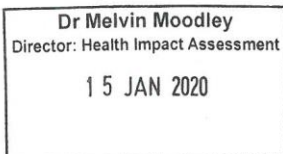
Kindly ensure that the following are adhered to:

1. Arrangements can be made with managers, providing that normal activities at requested facilities are not interrupted.

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4. The reference number above should be quoted in all future correspondence.

Yours sincerely

DR M MOODLEY
DIRECTOR: HEALTH IMPACT ASSESSMENT
DATE:
CC

Dr Melvin Moodley
Director: Health Impact Assessment

1 5 JAN 2020

Appendix J: RT HOSPITAL APPROVAL

Western Cape Government

Health

STRATEGY & HEALTH SUPPORT
Health.Research@westerncape.gov.za
tel: +27 21 483 0866: fax: +27 21 483 6058
5th Floor, Norton Rose House,, 8 Riebeek Street, Cape Town, 8001
www.capegateway.gov.za)

REFERENCE: WC_201911_026
ENQUIRIES: Dr Sabela Petros

P O Box 1906
Bellville
7535

For attention: MR Emmanuel Udekwe

Re: Effective Utilization of Human Resource Information Systems in the Health Sector of the Western Cape, South Africa.

Thank you for submitting your proposal to undertake the above-mentioned study. We are pleased to inform you that the department has granted you approval for your research.

Please contact the following people to assist you with any further enquiries in accessing the following sites:

Retreat CHC	**Susan Meyer**	**021 713 9800**

Kindly ensure that the following are adhered to:

1. Arrangements can be made with managers, providing that normal activities at requested facilities are not interrupted.

2. Researchers, in accessing provincial health facilities, are expressing consent to provide the department with an electronic copy of the final feedback (**annexure 9**) within six months of completion of research. This can be submitted to the provincial Research Co-ordinator (Health.Research@westerncape.gov.za).

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4. The reference number above should be quoted in all future correspondence.

Yours sincerely

DR M MOODLEY
DIRECTOR: HEALTH IMPACT ASSESSMENT
DATE: 05|02|2020
CC

Appendix K: EDITING CERTIFICATE

Ken Barris, PhD

Editing and research writing services

18 Doris Road, Claremont 7708, Cape Town, South Africa
ken.barris@gmail.com
+27(0)829289038

24 May 2022

To whom it may concern

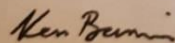This is to confirm that I have proofread the following thesis by Emmanuel Udekwe:

Effective utilisation of Human Resource Information Systems in the South African health sector.

Please note that this attends only to language usage, and not to content or organisation of content.

In isolated cases where meaning is uncertain, further changes will need to be implemented by the client on return of the work.

Best regards

KEN BARRIS

Appendix L: KEYWORDS/THEMES IDENTIFIED FROM FINDINGS

1	**Primitive system** **SRQ1.1** – Q1.1.7, HRIS for strategic decision; Q1.1.8, Other factors affecting HRIS usage. **SRQ2.1** – Q2.1.6, HRIS upgrades. **SRQ3.1** – Q3.1.5 Effective & efficient HRIS in health, **SRQ3.2** – Q3.2.4, Satisfied with PERSAL;
2	**Manual intervention** **SRQ1.1** – Q1.1.6, Information security in HRIS; Q1.1.7, HRIS for strategic decision; Q1.1.8, Other factors affecting HRIS **SRQ1.2** – Q1.2.5, Privacy of information. **SRQ2.1** – Q2.1.1, HRIS use to capture details of all workers; Q2.1.2, All workers access; Q2.1.3, Training on HRIS; Q2.1.4, Time & attendance, recruit & learning, absence management and scheduling; Q2.1.6, HRIS upgrades; Q2.1.7, Functionalities to communicate. **SRQ2.2** – Q2.2.1, Access to HRIS; Q2.2.2, HRIS challenges; Q2.2.3, HRIS to monitor and manage of workers; Q2.2.4, IS to interact with mgt., Q2.2.7, HRIS link with professional council **SRQ3.1** – Q3.1.2, HRIS use to promote & transfer; Q3.1.3, HRIS use to place people in right position; Q3.1.7, HRIS assist to service delivery. **SRQ3.2** – Q3.2.1, HRIS use for interaction with other IS; Q3.2.2, Strategies; Q3.2.3, Policies, Q3.2.4, Satisfied with PERSAL;
3	**Basic administration of information** **SRQ1.1** – Q1.1.7, HRIS for strategic decisions. **SRQ1.2** – Q1.2.6, Other reasons that impact on HRIS **SRQ3.1** – Q3.1.3, HRIS assist to place people in right position. **SRQ3.2** – Q3.2.2, Achieving strategies;
4	**Access to computers and other devices** **SRQ1.1** – Q1.1.6, Information security in HRIS; Q1.1.8, Other factors affecting HRIS. **SRQ2.1** – Q2.1.2, All workers access; Q2.1.3, Training on HRIS; Q2.1.6, HRIS upgrades, Q2.1.7, HRIS functionalities to communicate **SRQ2.2** – Q2.2.1, Worker's access to HRIS; Q2.2.2, HRIS challenges; Q2.2.4, IS to Interact with mgt. **SRQ3.1** – Q3.1.4, Mobile services; Q3.1.5, Effective & efficient HRIS; Q3.1.7, HRIS for service delivery. **SRQ3.2** – Q3.2.3, Policies;
5	**Availability of funds/budget** **SRQ1.1** – Q1.1.8, Other factors affecting HRIS **SRQ2**.1 – Q2.1.5, HRIS functionality why people resign **SRQ3.1** - Q3.1.3, HRIS use to place people in right position; Q3.2.4, Satisfied with PERSAL;
6	**Infrastructural challenges** **SRQ1.1** – Q1.1.5, Size of facility; Q1.1.8, Other factors affecting HRIS **SRQ3.1** – Q3.1.6, Shortage of workforce in Africa. **SRQ3.2** – Q3.2.6, Benefits of HRIS
7	**Centralised system** **SRQ1.1** – Q1.1.5, Size of facility. **SRQ1.2** – Q1.2.1, HRIS to record of workers details; Q1.2.4, Teamwork. **SRQ2.1** – Q2.1.3, Training on HRIS
8	**Sophistication of information system** **SRQ1.1** – Q1.1.5, Size of health facility. **SRQ2.2** – Q2.2.3, HRIS to monitor & manage workers **SRQ3.1**– Q3.1.2, HRIS use for promotion & transfer; Q3.1.3, HRIS use to place people in right

	position; Q3.1.7, HRIS for service delivery.
	SRQ3.2 – Q3.2.4, Satisfied with current HRIS;
9	**Timelessness of information**
	SRQ1.2 – Q1.2.1, Capture, record & retrieve workers details.
	SRQ2.2 – Q2.2.2, HRIS challenges; Q2.2.5, HRIS for salary and benefits.
	SRQ3.1 – Q3.1.4, Mobile services; Q3.1.7, HRIS for service delivery.
10	**Substructure challenges**
	SRQ1.1 - Q1.1.2, Hospital use of HRIS; Q1.1.4 Separate HRD; Q1.1.5, Size of health facility,
	SRQ1.2 – Q1.2.2, HRIS presence in health; Q1.2.6, Other reasons that impact HRIS
	SRQ2.2 – Q2.2.1, Access to HRIS; Q2.2.2, HRIS challenges; Q2.2.3, HRIS use to monitor & manage workers; Q2.2.6, IS to keep record of all employees.
	SRQ3.2 – Q3.2.1, HRIS interaction with other IS; Q3.2.4, Satisfied with current HRIS; Q3.2.5, Future expectations;
11	**Confidentiality of information**
	SRQ1.1 – Q1.1.6, Information security.
	SRQ1.2 – Q1.2.5, Privacy of information.
	SRQ2.1 – Q2.1.5, HRIS functionalities why people resign.
	SRQ2.2 – Q2.2.4, IS for interaction
	SRQ3.2 – Q3.2.3, Policies;
12	**Resistance to change**
	SRQ1.2 – Q1.2.1, Capture, record & retrieve workers details; Q1.2.6, Other reasons affecting HRIS.
	SRQ2.2 – Q2.2.2, HRIS challenges; Q2.2.3, HRIS to monitor & manage workers.
	SRQ3.1 – Q3.1.6, Shortage of workers in Africa; Q3.1.7, Service delivery;

Appendix M: SUMMARY OF QUANTITATIVE DATA

RQ1:	What factors hinder the effective utilisation of HRIS within the health sector of South Africa?					
SRQ1.1:	**What are the reasons for ineffective utilisation of HRIS in the health sector?**					
		SD	D	NA/D	A	SA	
S/NO		**1**	**2**	**3**	**4**	**5**	**TOTAL**
1	I have an idea of what HRIS means	8	9	10	8	11	46
2	The hospital makes use of HRIS	11	10	9	15	1	46
3	I know what HRIS is used for in the hospital	4	7	11	18	6	46
4	HRIS can help store and retrieve records and information of all the workforce in the health sector	8	9	13	12	4	46
5	The health sector has a standard HRIS	4	10	15	10	7	46
6	The hospital has a separate HR department/group/unit	9	13	6	13	5	46
7	The HR department have an HRIS that links with the provincial health department	3	7	13	17	6	46
8	There are reliable internet access and a Local Area Network in the hospital	6	11	10	13	6	46
9	The size of the hospital and its operation determine the effectiveness of HRIS	8	12	10	9	7	46
10	There is effective information security in place to safeguard the HRIS	4	4	18	19	1	46
11	HRIS enables HR Department to perform new or enhanced roles of information brokers and decision enabler in the hospital	2	11	23	8	2	46
12	Other factors can be identified as reasons for lack of effective use of HRIS in the health sector	2	4	15	22	3	46

SRQ1.2:	**How does HRIS impact on the performance of the health sector?**					
		SD	D	NA/D	A	SA	
S/NO		**1**	**2**	**3**	**4**	**5**	**TOTAL**
13	Capturing, recording and retrieval of information in the HRIS is very effective	3	12	10	19	2	46
14	The presence of HRIS has helped to improve in the way I discharge my duties	10	13	12	8	3	46
15	There are management incentives and target bonuses given to the HRIS administrators	8	14	19	5	0	46
16	There are effective teamwork and staff participation in your hospital to support the use of the HRIS	6	9	21	6	4	46
17	The use of HRIS has been able to provide confidentiality, privacy, and security of personnel information of the health workforce in the hospital	5	9	13	12	7	46
18	Clinicians and other health workers are adequately trained to interact with HRIS	9	25	10	2	0	46
19	Reasons for lack of effective HRIS in Health	2	5	13	19	7	46

Appendix N: SUMMARY OF TRANSCRIBED DATA

RQ 1: What factors hinder the effective utilisation of HRIS within the health sector of South Africa?		
SRQ1.1: What are the reasons for ineffective utilisation of HRIS in the health sector?		
IQ	**Summary**	
IQ1.1.1	**Do you know what HRIS means and what it is used for?**	
	RI04: PERSAL is a data center for the health workforce. EI01, EI06, EI07, EI08, EI09, EI10, EI11, EI12, MI01, MI07, MI08, MI09, RI03, RI07, RI08, RI09, RI12, RI13, and RI14: Indicate they have an idea of what HRIS means. RI01, RI02, RI06, and RI10: No, I don't. DI01, RI05, RI11, RI14, and EI05: No idea.	
IQ1.1.2	**Does your hospital make use of HRIS?**	
	RI04: I (facility manager) and some of the managers do the HR things manually and report to sub structure. EI13, RI07, and RI13: One lady deal with our HR functions and sends it to the substructure HRD. RI08, RI12, and RI14: NO but our leave gets captured manually and it gets sent off to another office in the substructure and they get captured in a system in the HRD.	
IQ1.1.3	**Do you know if there is a standard HRIS for the health sector in general?**	
	MI02, RI05, RI15, MI01, MI08, MI09, EI07, EI08, EI09, EI11, RI03, RI07, RI08, RI09, RI10, and RI11: The standard HRIS for the health sector is PERSAL system. RI14: There should be. EI04: I am not sure, but in the City Council, that control clinics uses ESS to update and apply for leave. MI05, MI07, RI12, and RI13: I am not conversant with HR system.	
IQ1.1.4	**Does your hospital have a separate HR department/group/unit?**	
	MI01, MI02, MI03, MI08, and MI09: Yes, we do have an HRD that makes use of PERSAL. EI01, EI04, EI06, EI09, EI10, EI11, and EI12: One lady deal with our HR and sends it to sub structure HRD. EI13, DI04, and RI07: We do have a point person that collates all relevant HR documents and send to the substructure.	
IQ1.1.5	**Does the size of your hospital and its operation determine the effectiveness of HRIS?**	
	RI04, RI06, DI04, and EI08: Yes, but the infrastructure available does not allow that, so our HR work is done in the substructure. EI13 and RI07: We have over 100 workers, so we need an HRD, but due to costs we had to deal with substructure. EI12, RI02, RI09, and RI12: Yes, because this is a big and 24hr facility, so we need an HRD.	
IQ1.1.6	**Is there effective information security in place to safeguard the HRIS?**	
	EI02, DI03, and EI12: Certain people at diff levels of access to information on the IS. EI04, EI07, and RI12: I think so because people have login access and there is antivirus to guard the IS. RI04, DI01, RI07, and RI08: Everyone using computer has login passwords and if there is any problem, the IT people from the sub structure will come and fix it. MI02: Currently, it does the good work of protecting the information of the employees.	
Q1.1.7	**Has the use of HRIS enable HR Department to perform new or enhanced roles of information brokers and decision enabler in your hospital?**	
	RI04, and RI07: Yes, we do have a system in place (manually) were on monthly basis, I (facility manager) will sign off the things that happen, we have a system in the consulting rooms were things are captured on the computer, although certain things are still manually captured. EI13: I am not sure, but they are also in the process, when I was employed 13 years ago the induction was done manually but this day's induction is done electronically, and certificates also generated electronically which is an improvement.	
IQ1.1.8	**What other factors you can identify to be reasons why HRIS's are not effectively utilised in the health sector?**	
	EI02, and EI06: Lack of funds, I can access my emails but it's a matter of getting the IS updated for people to access information Anywhere. MI06: People become too busy not been opportunities to explore and use the IS to its full capacity because of huge workload, it's just used for basic we use on every day. EI13, EI09, and EI11: Capturing of leaves are sometimes problematic, document gets lost in transit or not captured.	