Cape Peninsula
University of Technology

THE UTILISATION OF AN ELECTRONIC FILING SYSTEM TO OPTIMISE PATIENT MANAGEMENT IN A SELECTED PUBLIC HEALTHCARE FACILITY

By

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Declarartion

I, Dimpho Gift Molebatsi, declare that the contents of this thesis represent my own unaided work, and that the thesis has not previously been submitted for academic examinationtowards any qualification. Furthermore, it represents my own opinions and not necessarily those of the Cape Peninsula University of Technology.

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                      Signed   Date

Abstract

Most organisations have a latent need to incorporate business solutions that will assist them to manage their major functions. Electronic medical records meet this requirement and, through technology, provide a competitive advantage. The main problem that prompted this research study is the lack of or poor information management systems in public healthcare facilities, which often interferes with the efficiency of healthcare workers such as nurses, with an associated negative effect on patients. An objective of the study was to assess if paper filing supports or diminishes the effectiveness of service delivery at a selected public healthcare facility.

The study made use of descriptive statistics and inferential statistics while following a quantitative approach to achieve the study's aim and objectives. The questionnaire was essentially constructed with closed-ended questions, as it was believed that some guidance was required for the subjects. It contained one open ended question to allow some subjective input from the subjects. The questionnaire was analysed and tested for reliability using Cronbach's Alpha.The study used non-probability sampling technique, and the research sample was drawn from a selected public healthcare facility in Northern Cape Province.The total population of this study was 145 from which 113 participants were sampled comprising of both clinical staff members and healthcare users. The Bayesian test and Chi-square test methods were used to test the study's hypotheses, with the aid of statistical program Jamovi.

The study revealed poor management of patient medical records at the selected public healthcare facility, with the clinic's staff only receiving basic training to manage patient records. The study's findings further revealed that challenges associated with the use of electronic medical records include a lack of user-system skills, difficult systems, and systems being off-line. Theoretical framework in this study was mainly Record Continuum Model and Diffusion of Innovation Theory (DOI). Participants mentioned willingness to adopt and use electronic medical records, staff's knowledge of computers, and the ability to improve retrieval times of patients' records, were incentives to implement electronic medical records. Participants agreed that benefits such as reduced long queues for patient folders, increased access and privacy, and improved service quality would ensue from the use of electronic medical records, if implemented by the facility.

Keywords: *Electronic medical records, information technology, paper-based filing system, Batho Pele principles*

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Dedication

I dedicate this thesis to my parents, Masabata Monica Molebatsi and Tawana Ben Molebatsi

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Glossary

BATHO PELE
Batho Pele is a Sesotho adage, which means 'people first'. In the context of this study, Batho Pele refers to an initiative launched by the South African government to transform the public service, including healthcare services.

CPR
Computer-based patient record

CPUT
Cape Peninsula University of Technology

ECT
Electronic Communications and Transactions Act, No. 25 of 2002

EDRMS
Electronic document and records management system

EFFICIENCY
Is the optimal employment of resources over time, and a measure for government to examine how well it is performing the task that it is supposed to do within a given period, and without any regard for doing the right things.

EHR
Electronic health record

EMR
Electronic medical record

EPR
Electronic patient record

NARS
National Archives and Records Service

NARSSA
National Archives and Records Service of South Africa

NARSSAA
National Archives and Records Service of South Africa Act, No. 43 of 1996

NHA
National Health Act, No. 61 of 2003

PAIA
Promotion of Access to Information Act, No. 2 of 2000

PAJA
Promotion of Administrative Justice Act, No. 3 of 2000

RECORD LIFE-CYCLE
The above refers to the life of a record from its creation/receipt to the time of its idle maintenance (for instance, closed files may be consulted occasionally), and can either be categorised as a private transfer, promotion, or chronicled protection.

SERVICE DELIVERY
Service delivery defines the interaction between providers and clients, where the provider offers a service, involving either

information or a task, and the client finds value or loses value as a result.

CHAPTER 1: INTRODUCTION

1.1 Introduction

Public Service and Administration Minister, Ayanda Dlodlo, made a statement at the beginning of 2019, stating that "one of the problems that we have seen across the country is record keeping and the management of file information of the patient"(Province of KwaZulu-Natal. Department of Health, 2019). In South Africa, under the open division changes, the *Batho Pele* principles, instituted in 1997, govern issues of open administration conveyance to underscore straightforwardness, as well as responsibility. The *Batho Pele* standards, among others, uphold effective, as well as efficient public healthcare service delivery through a dependable and reliable therapeutic records routine. Public service in South Africa will be evaluated by using one paradigm: its ability to provide administrative services that meet the essential and fundamental needs of all native South Africans (South Africa. Public Service Commission, 2008:9). Section 2.6.1 discuss the *Batho Pele* standards further. The public sector experiences extraordinary difficulties in its endeavours to improve its open administration. Public servants need exact and cutting-edge data, which is instantly available. They need inner and outer data to be accessible for powerful and productive basic leadership. To improve its administrative conveyance, the public sector must achieve its goals to implement and improve proficiency, efficiency, and the nature of its administration.

Electronic health record (EHR), electronic medical record (EMR), electronic patient record (EPR), and computer-based patient record (CPR) are all terms used interchangeably to collect data on an individual's wellbeing status, and wellbeing care (Zhang, 2016: 2083). EMR, CPR, and EPR regularly allude to records at healthcare facilities, while the term electronic health record generally refers to a database comprising all individual wellbeing data over a person's lifetime, acknowledged and opened by healthcare suppliers, and dispersed into numerous destinations such as each healthcare environment at which the patient receives treatment.

1.2 Background of the problem

The researcher has had the privilege of experiencing the reality of both rural and urban public healthcare. In 2015, she enrolled for an ND: Office Management and Technology qualification. During the second year of study, all students had to do compulsory voluntary service for three weeks during the winter holidays at any organisation and had to write a report about their experience of working outside the classroom. The researcher chose to work at a specific clinic in South Africa. It was at this clinic and at other public healthcare clinics, that she had visited previously in large cities and in small towns, that she was able to experience the reality of urban and rural healthcare. These clinics had one thing in common in their daily processes. During a visit to a rural clinic for a first-time consultation, a new folder was completed with her demographic details, namely her name, address, language, symptoms, allergies, and so on.

This data was manually placed into a medical record (commonly known as paper patient folder/file), stapled, and given to the doctor for the consultation. The doctor treated her and requested a couple of tests with a subsequent repeat consultation. The doctor then stapled her notes together with notes on the tests she had suggested, symptoms, findings, and so forth. The patient's folder is subsequently filed until the patient's next visit. If the patient moves to a different city and visits a different clinic, she has to go through all those steps again for the new clinic to have her details on its system. This is done for every individual/patient that visits the clinic.

This results in a typical situation that occurs in any workplace that does not oversee its records electronically. The paper stacks become excessively large, and most clinics are forced to employ extra staff to deal with these paper stacks. Record keeping of all data in the doctor's office is normally in the format of forms and outlines. These records create a proliferation of paper that is hard to oversee, and it is difficult to retrieve and consult these records.

An electronic medical record is the term given to the record of patients in electronic format. Electronic records are compact and easily transferable to several entities at a time. EMR/EHR constitutes medical services, where each procedure comprising clinical information is computerised and well organised. This assists patients to obtain better medical services and doctors to find appropriate data, whilst adding to a general improvement in accessing and retrieving the data.

1.3 Current procedures in handling healthcare information

In view of today's diverse demands for health services, it is difficult to recognise and/or identify patients, know their medical history, and record and obtain data on treatment through an antiquated and inefficient information retrieval system. The initial introduction of paper-based documents meant that data could be ordered into one portable file, according to patients' demographics and medical history.

According to Evans (2016:48), paper-based records were not used regularly until 1900–1920. Medical records, health diagrams, and health records are used to refer to documenting a patient's restorative history and treatment. More recently, the term 'health record' has become prevalent when capturing patient medical data beyond episodic treatment alone. The above author further states that the development of EHRs was based on new technological innovations in the 1960s and 1970s.

The use of such electronic records has not only made patients' medical data simpler to peruse and accessible from virtually anywhere in the world, but has also improved the format of health records and transformed healthcare. Even though the handling of patient information processes in the healthcare sector has improved compared to current obsolete information capture and retrieval practices, there are shortcomings that still affect the efficiency and effectiveness of medical services.

1.4 Statement of the research problem

The main problem that prompted this research study is the lack of or poor information management systems in public healthcare facilities, which often interferes with the efficiency of healthcare workers such as nurses, with an associated negative effect on patients. Ineffective management of information often causes long waiting times for patients before they are attended to. Papers are easily lost, or go missing from patient folders, and it is difficult for healthcare workers to render good services to patients under such trying circumstances. It can be risky when a healthcare worker treats a patient with insufficient information on the patient's health background, thus rendering a poor health service. The paper-based filing systems currently in use are time consuming, and healthcare administrative staff spend excessive amounts of time searching for files that are misfiled or missing.

1.5 Purpose of the study

This study was conducted to determine whether the current paper-based filing system used at a public clinic in the Northern Cape Province increases or diminishes the efficacy of service delivery in patient care.

1.6 Research questions and Hypotheses

- How do patient records obstruct the provision of public healthcare service at a selected public healthcare facility?
- What are the main reasons for misplaced patient folders at a selected community healthcare facility?
- How would paper filing support or diminish the effectiveness of service delivery at a selected public healthcare facility?
- How does staff perceive information management technology?
- What are the benefits and challenges of both paper-based and electronic filing systems?
- How can moving from a paper-based filing system to an electronic filing system improve healthcare work, as well as benefit patients' lives at the healthcare facility?
- What are the required measures to improve daily processes to ensure best management of information, whilst improving efficiency at the public healthcare facility?

Two specific hypotheses were constructed:

- **Hypothesis 1**

Hypothesis 1 (H0): There is independence between patients (health users) and clinical staff members regarding benefits of computerizing patient records at a selected public healthcare facility.

Hypothesis 1 (HA): There is dependence between patients (health users) and clinical staff members regarding benefits of computerizing patient records at a selected public healthcare facility

- **Hypothesis 2**

Hypothesis 1 (H0): There is no statistically significant difference between the time patients wait before receiving medical folders compared with the time spent by clinical staff members retrieving medical folders.

Hypothesis 1 (HA): There is statistically significant difference between the time patients wait before receiving medical folders compared with the time spent by clinical staff members retrieving medical folders.

1.7 Research objectives

Key objectives underpinning the current study are outlined below. The objectives are to:
- **Determine** the status of the management of patient records that obstructs the provision of public healthcare services at the selected public healthcare facility
- **Identify** the main reasons for misplaced folders that hinder delivery of services in the selected community healthcare facility
- **Assess** if paper filing supports or diminishes the effectiveness of service delivery at a selected public healthcare facility;
- **Understand** the awareness of personnel with regard to information management technology
- **Identify** the benefits and challenges of the paper-based filing system, and electronic filing at the selected public healthcare facility;
- **Explore** the effects of technology on information management of health workers and patients at the public healthcare facility; and
- **Investigate** what modifications can be done to improve current daily processes at the selected public healthcare facility.

Table 1.1: *Summary of Research questions and objectives*

Research Questions	Research Objectives	Data Collection Method
How do patient records obstruct the provision of public healthcare service at a selected public healthcare facility?	**Determine** the status of patient management records that obstructs the provision of public healthcare services at the selected public healthcare facility	Questionnaire
What are the main reasons for misplaced patient folders at a selected community healthcare facility?	**Identify** the main reasons for misplaced folders that hinder delivery of services in the selected community healthcare facility	Questionnaire
How would paper filing support or diminish the effectiveness of service delivery at a selected public healthcare facility?	**Assess** if paper filing supports or diminishes the effectiveness of service delivery at a selected public healthcare facility	Questionnaire
How does clinical staff perceive	**Understand** the awareness of personnel with regard to	Questionnaire

information management technology?	information management technology	
What are the benefits and challenges of both paper-based and electronic filing systems?	**Identify** the benefits and challenges of the paper-based filing system, and electronic filing at the selected public healthcare facility;	Questionnaire
How can moving from a paper-based filing system to an electronic filing system improve healthcare work, as well as benefit patients' lives at the healthcare facility?	**Explore** the effects of technology on information management on health workers and patients at the public healthcare facility; and	Questionnaire
What are the required measures to improve daily processes to ensure best management of information, whilst improving efficiency at the public healthcare facility?	**Investigate** what modifications can be done to improve current daily processes at the selected public healthcare facility.	Questionnaire

1.8   Justification for the study

Several scholars have studied record management in South Africa. Luthuli and Kalusopa(2017) focused on the management of medical records in the provision of public sector services in KwaZulu-Natal (KZN), while Marutha and Ngoepe(2017) studied medical records in service delivery in public health services in the Limpopo Province. Other studies such as that of Katuu(2015), focused on South African public institutions, in general, while Mathebene-Bokwe(2015) concentrated on a single state hospital in the Eastern Cape Province. The current research project was located at a public healthcare clinic in the Northern Cape Province.

The South African government instituted the *Batho Pele* principles to improve service delivery, and to transform public services. In this regard, competent management of records is paramount to guarantee that applicable records and data are kept securely, and accessible when needed. The current research commenced with the rationale to establish a record-management system capable of improving service delivery for the public healthcare sector. This research should help the public healthcare sector and its agencies to identify and implement the requisite technology and systems to allow healthcare organisations to provide an efficient public health service.

Effective management of patient health information will eliminate time spent to retrieve files, long patient waiting times, and misplaced/missing files. This research, therefore, should assist with implementing requisite systems for the selected public healthcare facility to provide an effective and efficient health service.

1.9   Contribution of the research

The outcome of this study should contribute to the existing body of knowledge in respect to the utilisation of an electronic filing system to optimise patient management in a selected public healthcare facility. In its coverage on the lack of or poor information management systems in public healthcare facilities, which often interferes with the efficiency of healthcare workers such as nurses, with an associated negative effect on patients, the study explores how the public healthcare facility may benefit from effective information management, also taking into consideration its impact on health workers and patients, and solicited staff members' opinions. This study should aid the specific public healthcare facility to establish whether or not a new system can improve its health services, including patient satisfaction and waiting time.

1.10 Scope and limitations of the study

This study was conducted in the Northern Cape Province of South Africa at a specific public healthcare facility. Hence, it was restricted to one selected public healthcare facility, as explained in the study population and sample frame. Efforts to obtain the permission letter from other clinics in different provinces proved difficult due to different policies and structures governing those healthcare departments. Therefore, the findings from this study are applicable to this specific clinic only and exclude other clinics from other provinces.

1.11 Ethical considerations

According to the 'Ethical Guidelines and Principles of Conduct for Anthropologists', published in *Anthropology Southern Africa*(2005:142-143), it is essential to inform respondents of the purpose of the research, and, where conceivable and doable, to incorporate their concerns within the research design and accommodate them in respect of the research methods. Researchers should be mindful of the rights of participants in the research study.

Ethics centres around the controls that review models of conduct, for instance, theory, religion, philosophy, or sociology (Resnik, 2015). According to Resnik (2015), there have been numerous explanations for the importance of adherence to moral standards. First, standards advance the point of investigation, similar to information, truth, and evasion of blunder. For example, provisions against the manufacture, falsification or misrepresentation of research data encourage truth and mitigate error. For this study, the examiner informed respondents of the aims of the study and assured them that any information divulged by

them would be treated with the utmost confidentiality. Furthermore, all sources of information and data used in the thesis were duly acknowledged throughout.

Secondly, since analysis for the most part included a decent arrangement of coordination and participation among numerous elective people in few controls and foundations, moral principles advanced the qualities that are fundamental to helpful work such as trust, duty, shared regard, and reasonableness. For instance, a few good standards in analysis, similar to tips for origin, copyright and protecting approaches, data sharing strategies, and classification rules audit, are intended to shield holding interest through reassuring cooperation. Most scientists desire acknowledgement of their work; however, they do not want their concepts disclosed/published in an untimely manner (Resnik, 2015).

To conduct this study, ethical clearance was obtained from both the Northern Cape Department of Health and the Research Ethics Committee of the Faculty of Business and Management Sciences at the Cape Peninsula University of Technology (CPUT) (see Appendix A: Ethical Clearance). Research participants were not coerced to participate in the study, and all participants signed a letter of consent (see Appendix B: Letter of Consent) in respect of their participation in this study. Personal information of participants such as their identities were neither requested nor mentioned, and anonymity was maintained consistently.

Researchers and reviewers have an ethical responsibility to recognise and protect the rights of respondents in human research (Burns & Grove, 2005:181).The researcher considered ethical issues to ensure professionalism and the overall quality of the research report. Respondents were assured that all data that they provided would be handled with the highest level of confidentiality.

1.12 Overview of research methodology

In order to ensure efficient administration of the research, the researcher defined the principles and preliminary methods. This research employed a positivistic research worldview. As indicated by Collis and Hussey (2009:3), research can be classified according to the *purpose* of the research, *process* of the research, *logic* of the research, and *outcome* of the research. This research was descriptive in nature and used quantitative methods and open- and closed-ended questions as data-collection methods. The population of this research study, as well as the sampling methods, are described in subsequent chapters, as is the research process, instruments and limitations of the research.

1.13 Organisation of the thesis

Chapter 1: Is the background of the study which aims to inform the reader with the topic that prompted the exploration/research. It further indicates the rationale for the study, ethical considerations and the significance of the study in respect of its aims and objectives.

Chapter 2: Literature reviewed in the study aims to provide an overview of records management, as well as a better understanding of the importance of electronic filing in public healthcare in respect of service delivery. The first few sections of this chapter provide a detailed discussion of the literature in terms of improving healthcare management system efficiencies from an international and local perspective. chapter is organised as follows, section findings were also correlated with previous research of this nature. Lastly, the chapter further discuses legislative frameworks governing medical records as well as the principles in the healthcare industry.

Chapter 3: Research methodology

The research methodology situated the research within a specific approach custom, depicted the exploration setting, and tested information accumulation and investigation strategies. The aim of this chapter was to furnish the reader with a detailed record of the procedures and methodology that the study used, and provided a greater understanding of the research process.

Chapter 4: is the data analysis, presentation and discussion of results of the data collected. The chapter is organised into three sections. The first section presents the interpretation of data collected, tables and figures are used to present the data followed by the discussion of the data presented to provide greater knowledge and insight into the current problem under investigation. In order to test the viability of the current study undertaken, the last section of this chapter discuss the research hypotheses in line with the aim and objectives of the study. The findings were then further analysed to determine solutions to the problem or shortcomings in the study.

Chapter 5: it concludes the study by providing a detailed summary, conclusions and recommendations of the entire study by proposing suggestions and recommendations for future research.

1.14 Summary

This introductory chapter outlined a background of the study. It presented the core research problem that prompted the study, provided definitions of key terms, and outlined the structure of the thesis, as well as the research methodology adopted by the study. The following chapter, chapter two provides a literature review of related studies with regard to records management and service delivery.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

While Chapter 1 introduced the research topic, and presented an outline of the study, Chapter 2 reviews scholarly literature that informs the research. This chapter presents the reviewed literature, summarising various scholars' reports of electronic records worldwide, as well as in South Africa, and thus contextualises the study. The literature review includes patients' information, administration studies related to information (record) management, electronic filing, the effects of technology on information management, the benefits of proper information management in public healthcare, and the legislative framework that regulates record management in South Africa.

2.2 e-Health (Managing clinical/medical records)

Electronic Health (eHealth) is defined by World Health Organisation (WHO, 2018) as "the use of information and communication technologies (ICTs) for health, for instance to treat patients, pursue research, track disease and monitor public health". The importance of electronic health is to provide patients with the ability to access their medical records from anywhere in the world. In addition Electronic Health (eHealth) is a technology used to support health, well-being and healthcare and can offer many benefits such as an increased quality of care and increased self-management (van Gemert-Pijnen et al., 2018).

The use of technology is increasing rapidly in healthcare and aids as a tool for effective communication channel between clinical staff members and patients. E-Health, for instance, provides the means to facilitate communication between care providers and between healthcare users and healthcare providers and to effectively exchange information (Talboom-Kamp et al., 2018:6). Despite the great benefits of eHealth, the South African public healthcare sector, patient medical records are still being written on paper and kept in filling room. Several administrative processes still use manual systems or support the use of paper media within the administrative process. The manual process of storing or keeping clinical or medical records has many disadvantages such as clinical stuff taking an extended time to retrieve patient folders and being ineffective (Chen et al., 2016:42). The amount of time that the records are retrieved and served for this purpose confirms the patient waiting time for the service. This influences the standard of the service rendered by the healthcare institution.

In addition, the patients' record is used to capture information regarding the patient's personal details, prescriptions and diagnosing for future relations for follow-up visits. There

are several disadvantages related to the use of paper-based patient record system, corresponding to loss, duplication, theft, high possibilities of human error like misinterpretation of indecipherable handwriting. Moreover, handling of medical records in the form of paper seems out-dated, especially in the era of 4th industrial revolution. The industrial revolution 4.0 is defined as an industrial era where all entities within it can communicate with one another in real-time at any time through the use of the internet and Cyber Physical System (CPS) technology. This allows the making of new values or other existing optimizations from every process within the industry (Prasetyo & Sutopo, 2018:19).

The healthcare institutions are now faced with an extra disadvantage related to the use of paper-based patient record keeping, which is transmission of the SARS-COV-2 virus throughout handling records. A novel human coronavirus that is now named severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) (formerly called HCoV-19) emerged in Wuhan, China, in late 2019 (Doremalen et al., 2020:1). This procedure of handling paper files will rapidly cause a rise in the spread of COVID-19 virus to healthcare staff with or without developing of symptoms of SARS-COV-2. A rise in the number of quarantined healthcare personnel, and in morbidity and mortality among healthcare workers, may doubtless cripple the healthcare system.

The study conducted by Prastyo et al. (2020:112), stated that going paperless promotes time-efficiency and it is environmentally friendly. The study of Prastyo et al. (2020:112), further indicates that going paperless also promotes correct documentation management, and enhances the healthcare system. During this severe acute respiratory syndrome-related coronavirus-2 (SARS-CoV-2) pandemic, the virus may be transmitted through the physical manipulation of patient records by numerous classes of employees who handle the record with or without wearing gloves for protection. The COVID-19 virus expelled by an infected individual has been found to survive for a longer period of time on completely different surfaces. It can continue to exist on cardboard or paper (e.g. patient record files) for 4 – 24 hours, a time window during which the COVID virus will be transmitted (Doremalen et al., 2020:1). The virus might stay on sleek surfaces corresponding to paper for extended time compared to non-smooth surfaces such as tissue paper (Chin et al., 2020:10).

In other developing countries such as Ghana, the need for efficient and reliable telecommunication services has been recognised, and one of the key reasons many public health institutions are going paperless as the need for quality and easily accessible data intensifies (Yusif et al., 2020:204). As the need for quality and easily accessible data intensifies, technology is one tool to support the transition from manual to paperless system based. According to Pine and Chen (2020:5), digital information systems like electronic medical records (EMRs) and electronic health records (EHRs) are designed to facilitate

information flow and accessibility of patient records on record time. Indeed, accessing patient medical records anytime and anywhere has been advocated as a main benefit of such system. In distinction with paper-based system, where patient records could solely be accessed by one person at a time and had to be effort fully transported around. In addition, the development of technology has become part of our lives, technology has modified the methods which clinical staff members communicate, share data and interact with healthcare users. The utilization of technology has helped organisations improve services rendered by healthcare workers, and has accessibility and convenience of quick information (Talip & Zulkifli, 2018:1).

2.2.1 Patient medical records filing systems (Infrastructure)

According to McWay (2013:135), with regard to electronic systems, information can be kept in patient files, organised according to the information-tracking system. The record classification system is based on numerical characters. A group or serial labelling system can be used, while the serial numbering system is based on the contact scheme for the same patient between records. The electronic medical record is a paper information adaptation that includes the history of a patient within a single practice. A supplier uses EMRs to classify patients that are due for preventive visits and screenings, monitor patients' health, document data, and enhance the standard of care. *A paper-based filing system includes the number of records to be filed, the length of time those records will be stored, the type and cost of filing equipment, and the need for ready access to case records. Some filing equipment choices include lateral filing units, vertical file cabinets, and open-shelf files that may be stationary, mobile or compact*(McWay, 2013:135).

Electronic medical records allow the user to access the exact data required. For example, when personnel require certain/specific information, and do not wish to access the full medical history of a patient, the EMR framework permits entry solely to the data that is required to complete the task. The EMR framework has inbuilt safety mechanisms to prevent access to confidential data such as medical records, by unauthorised persons (Molis, 2018). According to Erasmus *et al.* (2012:23), "infrastructure and technology make up the visible interface between health departments and the public at large, and it is important that their quality, condition and cleanliness reflect the high standards set by health departments for provision of health services to a country's people". Health facilities should oversee and manage records, as per government regulations, as means to empower workers in healthcare facilities to have quick access to precise and solid patient data. The *National Archives and Record Service of South Africa Act, No. 43 of 1996* (NARSSAA) makes provision in Section 13 for sound records management, thus facilitating transparency and

better delivery of services. Whether an organisation produces medical records on paper or electronically, it is important to have a well-organised filing system in place to enable effective storage and retrieval of records.

2.2.1.1 Comparison of electronic filing and paper based filing systems

The scenarios

1. Patient's first visit at a clinic

On a patient's first visit, he/she receives a new medical log and a specific number is allocated for the purpose of registration. The patient is given an envelope/folder that contains his or her medical history, and after the visit, the patient returns the envelope/folder to the reception/administrative staff. In an EMR program, barcodes are used to check the medical record, and to link it to the EMR system. Barcodes help to identify patients, and to reduce errors, whilst improving performance and accuracy. In paper-based records, a patient's specific number identifies the patient's record. The record is arranged squarely by using the primary pair of the patient's number digits.

2. Existing patient's visit at a clinic

The patient's file can be accessed by means of a simple search on the EMR system and is provided to the patient within minutes. When an organisation uses a paper-based filing system to retrieve patient information/folder, the process tends to take longer. Archive/administrative staff must locate a medical record, with the patient held up in the reception area until they retrieve the record. Following the appointment, the patient returns the file to reception, and administrative staff again record and file it according to the patient's specific number.

2.2.1.2 Space

Healthcare record officers are mindful of office requirements for the proficient administration of healthcare record services. According to Sugiarti (2020:180) state that, "problems that occur in hospitals associated with storing medical record document files(filing) are insufficient space availability due to a large number of patient medical record documents…". The clinic administration oversees ensuring that the health record administration of the establishment has satisfactory offices, which are conducive to the efficient everyday activities of the administration. These include:

- The record division/office should be situated in a location that is conducive to the quick recovery and dispersion of patient records;

- The office and workspace should be adequate for health records staff to fulfil their obligations, and for other authorised staff to work with patients' records, including records on microfilm or personal computers;

- There should be adequate room for future storage needs. This includes:

  - A functioning storage area with adequate space to incorporate all patient records currently in use by staff;

  - Accessible space to accommodate both current and inert health records preserved under statutory rules; and

- Areas for dynamic and latent health record stockpiling should be secure to guard information against damage or use by unauthorised persons.

2.2.2 Information management of paper and electronic records

Information is the life blood of any organisation, yet most organisations struggle to find what they need, when they need it, and how to manage what they know. Management of information is essential for public healthcare, as it supports good business administration, as well as efficient organisation.

2.2.2.1 Paper records management

Msiska *et al.* (2017: 247) state the following benefits of using paper to manage records:

- Employees (doctors, physicians, medical experts, medical examiners) generally still use paper-based records, since many healthcare employees are familiar with the paper system;

- The traditional paper record system does not necessitate the degree of specialised information and skills needed for electronic record keeping. Traditional paper systems can be used by less educated people with little training;

- Customisation: it is also easy to file papers without having to scan and upload documents on a computer;

- One can change your structure freely, without attention to the prerequisites or impediments of her;

- One can change the forms as one sees fit – for example, one can incorporate logos;

- Humans have a greater connection to writing. In addition, in the event that one has to complete a large number of worksheets with patients waiting to be attended to, it is easier to file paper documents, as opposed to checking and transferring information into the patient's record (Hall, 2016); and

- Most human beings are familiar with paper. It is easy and convenient to implement (Hall, 2016).

However, some challenges of using paper filing system are:

- Storage is one of the disadvantages of using a paper filing system; information can get lost and files can be destroyed or stolen;

- As most people type fast yet write slowly, using a paper filing system can be more time consuming (Hall, 2016);

- Indecipherable handwriting may lead to mistakes, and compromise captured data. Bad details such as combining experimental cases and organizing incorrect drugs (Msiska *et al.*, 2017: 247);

- Paper-filing frameworks require privacy as they are mutual among various patients and security could be breached. Unauthorised persons can access data easily; and

- Persistent follow-up is difficult in paper-filing systems.

2.2.2.2 Electronic records management

Electronic records should be managed effectively, since an inability to do this could have broad ramifications; for example, a loss of records may prompt genuine business, legal and budgetary concerns. It might likewise prompt a loss of substance and setting such records, and in this manner render it insignificant and un-trusted.

Electronic patient records should be protected so that their frame, recovery, and quality, as proof of specific movement, are not exposed to change, bearing in mind the security of the records (Lin *et al.*, 2003). For instance, when data in patient files change, clinicians and attendants will inevitably find it pointless for patients to have a follow-up visit. That alone is a wellbeing hazard, because the specialist could rehash a similar medicine or treatment directed at the principal consultation.

Major challenges of computer systems

- There is a chance that unauthorized individuals with malicious intent may access private information.

- The start-up costs could be steep to purchase the required hardware and software to convert from paper to electronic system (Carpenter, 2017).

- Challenges that might arise when using the system are space, how to maintain the hard drive and storage.

- Another disadvantage is when the system crashes over a period of time, it can be devastating.

Furthermore, electronic filing system has benefits too, as shown below.

- It allows for greater efficiency to perform tasks.

- It ensures efficient administration.

- It ensures uniform storage of records, and this system also offers storage capacity efficiency, and enhances retrieval of records,

- Electronic patient files are more accessible than the old recording system that used paper (Carpenter, 2017). For example, storing information electronically will make documents are easier to read for new nurses and doctors.

Cowan and Haslam (2006) argue that it is fast and extremely effective for the development or enhancement of organizing medical information from paper to digital. Notwithstanding, that it is by all accounts hard to accomplish a few focuses because of troubles in a few phases. With electronic medicinal information, it is quicker to accumulate clinical archives, which are documented consequently. The plan of patients' rundown on referrals, recovery of data, and evaluating clinical data, are additionally quick. The South African government is currently becoming mindful that functioning by using a traditional paper framework may not enhance its administration. Individuals remain dependent on digital administrations (Asogwa, 2012:103). Governments are continually taking advantage of innovations that deal with substantial quantities of documents. It empowers the association to accomplish tasks speedier, using little exertion, and minimum cash, whilst adhering to regulations and directions. Electronic records may likewise aid the enhancement of administration conveyance within general wellbeing areas. The usefulness of electronic documents and a

records management system should be considered for its dependability and for fiasco recuperation, while additionally, it has the capacity to deal with those records regardless of whether they are paper, media or electronic (Johnston & Bowen, 2005: 134).

2.2.3 Information technology and information management in the public sector

Most institutions depend on information technology (IT) to improve data procedures, and these computer-based information systems often contain large amounts of information that are collected and captured. The implementation of healthcare facility information systems can have a profound impact on the agency, healthcare workers and patients. According to Hinton (2006), knowledge processing is intended to assist with decision making. Data and information is never collected for its own sake, but rather, it is gathered for use. Management of information helps a company at all levels.

> Primary care providers manage information (from patients and other sources), integrate it with biomedical knowledge, and decide, with patients, on a course of activities. Generally, this task is accomplished with pen and paper, despite the availability of many electronic medical record systems (Bates *et al.*, 2003: 2).

It may support clinical information management; some circumstances need to be managed extensively, producing enormous amount of clinical information. Information technology can be used to document and organise information so that treatment decisions can be reviewed and improved. Well-managed information assists the institution to preserve well-organised patient information, because well-organised information enables the organisation to perform its functions efficiently and in an accountable manner, whilst rendering consistent service delivery.

2.2.4 Information management (challenges and benefits)

2.2.4.1 Challenges of information management

According to Sugiarti (2020:187), "the medical record is a proof for patients that health service efforts carried out by health workers are optimally provided by service standards and professional health standards and professional code of ethics", moreover Sugiarti (2020:197) states that, "incomplete medical records of patients may cause problems in regulations and implementation stages". In addition some challenges of information management pertain to government regulations, disposal problems, reduced productivity, squandered space and in-house storage risks. In terms of government regulations, the government is clear on information that can be shared, as well as information that should be

secured. When information is stored in-house, records are exposed to risks such as information rupture or loss. In terms of disposal problems, patient records are being kept until the retention period has passed. These records should be destroyed appropriately, as they are at greater risk when unprotected.

One of the advantages of paper record management system is security and paper filing is less complex than electronic systems. In addition Dutta and Hwang (2020:6) pointed out that information of patients that is stored using EMR is riskier in terms of security and confidentiality compared to storing patient's information using paper records. However, Pine and Chen (2020:5) argue that, digital information systems like EMRs (electronic medical records) and HER (electronic health records) are designed to market information flow and knowledge availability. Furthermore, Msiska et al. (2017:247) state that, "the use of information technology (IT) in health has revolutionized and improved the delivery of healthcare services globally and it has been applied in hospitals for the administration and management of patients, human resources, procurement, emergency fleet management and much more."

According to Ting *et al.* (2011:25), huge collections of paper-based medical records pose a challenge to medical practices, since these documents are often difficult to collect, collate and retrieve, while important patient information is frequently lost or mislaid. Medical practices face a daunting task in respect of storage. Compliance with government guidelines and regulations, as well as considerations of staffing and lack of space, are all major challenges when storing medical records.

2.2.4.2. Benefits of information management

There are concomitant benefits of managing information; these benefits can have a profound impact not only on the organisation, but also on health workers and the institution's clients. The benefits of proper information management may include (but are not limited to):

- greater efficiency in performing tasks;
- efficient administration;
- uniform storage of records;
- increased storage capacity; and
- quick and easy retrieval of records.

2.2.4.2.1 Problem solving and decision-making

Effective information management is crucial when taking decisions and solving related problems. Clinical staff (nurses and administrative personnel) require records and patient files, and the speed with which the choices are made and the nature of the choices, rely on the accessibility of data.

The successful use of records and documents depends on how they are administered, and their accessibility to clinic staff. Data is either divided crosswise over various useful regions or scattered along various data stages. Thus, nurses and administrators experience considerable problems when they require solid data. There are likewise examples where data is accessible, but not exact. Senior staff frequently lack a unified perspective of key measurements in deciding if their decisions have resulted in the desired impact. This hampers choices, which are required to drive compelling administrative conveyance, assess data, actualise changes, access reports, and screen effects (Steenkamp & Kashyap, 2010: 385).

2.2.4.2.2 Enhanced retrieval and easy access

Data processing has moved from a rather arcane computer and information science discipline to one of the most central, if not the most central technologies to access information in the modern world (Manning *et al.*, 2008). The variety of factors that influence where documents are, and how people look for them, is a striking observation about how documents are stored in the office (Rao *et al.*, 1994: 182).

When patient information is managed properly, and filed according to a well-planned filing system, retrieving information when needed is much faster than when a worker has to search a full filing cabinet to look for a single file. Electronic storage of information or patient files, according to organisational preference or by unique number, may improve health workers' morale, especially when they know that they do not have to spend an enormous amount of time in the filing room, as information will simply be a 'click' away. Searching for patient information can be simplified by using a search engine, and information can be retrieved easily and on time. When information is captured correctly, health workers can use search engines by typing a number, key word, or any other information according to the system's programme. The patient's information will then be displayed on the screen (Wassermann, 2001: 16). Data that is collected or produced must be regularly arranged and stored to promote its exchange and processing. Proper preservation of accurate and complete documentation and information, and proper access to them, help those with the right to know what was done, and how it was done. This aids those responsible for running

organisations, performing procedures and delivering results, and ensures accountability (Willis, 2005:91).

2.2.4.2.3 Patient information governance

Information is also stored for administrative purposes. When implementing technology in a public clinic or in any other institution, it is not a project; instead, it is a journey taken to radically change or transform service care delivery. In healthcare, poor governance accounts for much of the inefficiency in the provision of service, and in some situations, it leads to no service at all. According to Posthumus and Von Solms (2004:646), information security management is a complex issue that requires everyone in an organisation to do their part to protect valuable information and business assets. When effectively managed, information security will benefit the company in ways that go beyond the mere observance of lawful behaviour.

2.3 State of electronic medical records (EMR)

The prime objective of an EMR is to enhance the capacity of a healthcare supplier/provider to archive patient records, and to supply enhanced data on the treatment of people in his or her care. In addition, Keshta and Odeh (2020:6) states that "EMR/EHR systems allows the structure of medical data to be shared easily among the authorized healthcare providers so as to improve the overall quality of the healthcare services delivered to the patients".

In contrast, Dutta and Hwang (2020:6) pointed out that, despite the significant outcomes of using EMR in patients' care, the adoption rate of EMR is still low. There are potential barriers behind the comparatively low adoption of Electronic Medical Records. Waithera et al. (2017:6) were of the view that, shortcomings influencing the adoption and use of EMR systems are things like "lack of computer proficiency, insecurity and inadequate funding to facilitate acquisition of EMR infrastructure". Moreover, the study done by Nematollahi et al. (2017) found that, facilitating conditions and behavioural intention are factors affecting the adoption and use of electronic medical records.

Other important factor affecting the adoption and use of electronic medical records is the attitude of healthcare professionals' towards EMR system. In addition Dutta and Hwang (2020:6) emphasizes that, "the potential barriers behind the comparatively low adoption rate of EMR by physicians are privacy, security, concerns, high start-up cost, workflow changes, system complexity, lack of reliability of the system, and interoperability". Alanazi et al. (2020) argue that "factors influencing healthcare professionals' attitude towards EMR/EHR systems

are mainly related to their perceived ease of use, usefulness and need of the user as well as personal factors".

The utilization of innovation in administration wellbeing has been a major need for numerous developed and developing nations (Osunyomi & Grobbelaar, 2015:8). Innovation and information and communications technology (ICT) has become empowering instruments for the wellbeing of administration conveyance. The use of innovation and/or ICT within the wellbeing segment has led to the execution of electronic wellbeing (e-health) administration. Numerous developed countries have made large investments in e-health frameworks, while developing states are attempting to actualise such frameworks (Busagala & Kawono, 2013).

2.3.1 The use of EMR in developing countries

Fitzpatrick and Ellingsen (2013) note that it is expected that EMR systems will improve the precision of the affected role treatment of selective data that is documented in patient records, maintain clinical decision making, and improve the access of patient healthcare information for space and continuity of care. EMR systems can produce healthcare statistics from a management viewpoint that are critical for the direction and planning of healthcare, thus improving the daily health data legacy of health systems. The application and use of EMR systems in developing countries have been studied for over a decade, and the use of technology has reduced patient waiting times and prescription order errors, facilitated the classification of healthcare procedures, and streamlined the production of higher authority compulsory documents.

The use of electronic medical records worldwide is uneven because there is no widespread methodology in the use of an electronic framework. Many developing nations have insufficient assets to provide health institutions with cutting- edge advances in this respect (Mugo *et al.*, 2014). There is a need for data communication innovation, aptitudes and information, whilst destitute arrangements fail to address short and long haul needs (Busagal & Kawono, 2013). Restricted budget distributions for the wellbeing segment (UNICEF, 2017) also add to the above factors, contributing to low levels of benefit conversance in terms of time.

According to Sani *et al.* (2018: 156), in Nigeria, state-of-the-art practices in patient healthcare management were noted to be lacking, with restricted use of modern-day technology, resulting in problems with transmission of patient information, insufficiency of information, duplication of records, and loss of information, which are some of the elements that hinder viable and effective healthcare delivery, use and research. Staff invest more

energy searching for information than they spend on healthcare provision. Countries such as Ghana and Malawi have attempted to actualise a national electronic health record framework; however, difficulties, for example, an absence of government backing and important foundations, the lack of a stable power supply, and obstruction from medical services workers, have made these activities ineffective (Katurura & Cilliers, 2018:2).

2.3.2 The use of EMR in South Africa

Participating in a debate on the State of the Nation address on 25 June 2019, Health Minister, Dr Zweli Mkhize, noted:

> The unresolved issues of unaffordable private health care and poor levels of service delivery in the public sector have impacted negatively on our national health care system, resulting in our inability to ensure that all South Africans have access to quality health care based on need and not on their ability to pay.
>
> This government is determined to end these inequalities and bring quality health care to all, as demonstrated by the establishment of the War Room in the Presidency.

South Africa is creating numerous systems to improve public healthcare services, as well as the openness of public health record administrations. One of these is implementation of the National Health Insurance (NHI) (*BusinessTech*, 2019). This system should improve and provide essential quality to South Africans with high quality services. The NHI, together with EMR, could enhance the quality of patient care. The problems that SA faces are no different from those that other countries face globally. Once a politically – sanctioned, racially segregated country, South Africa now operates on a vote-based system, experiencing significant changes. It has established a reasonable advancement plan to invert its social imbalances, with major work in-progress amongst most of its populace, striving to improve administration conveyance, and, at last, to obtain the personal satisfaction of every individual (South Africa National Health Acts, 2003: 45).

Public healthcare institutions in South Africa use distinctive wellbeing record management frameworks, which do not effectively coordinate with one another. Some South African clinics use electronic or computerised records; others use both paper-based and electronic records, while others do not keep records at all. Some clinics encourage patients to bring their records when visiting public healthcare facilities (Marszalek & De Villiers, 2006:15). There are essentially two kinds of ambulatory medical records that South African clinics use, namely the patient-held medical folder/record, and the office-held medical folder/record. Office-held records are kept and documented at the clinics, while those held by patients are kept by them and may be used at any facility (Kerry, 2006:16).

In South Africa, implementation of various electronic health record systems from various vendors present a challenge, as these systems are engineered with different underlying information architectures, and so typically fail to share information. Likewise, while these frameworks either are enforced or have been used in certain regions, South Africa still uses paper-based filing for most of its public healthcare. Subsequently, this was because of the need to strengthen the clinic's delivery of service, in conjunction with the public sector's filing system.

2.3.3 Northern Cape Department of Health services

This research study is of the interest in the community healthcare facility in the Northern Cape Province, because the institution renders health services and information and/or record management, respectively, because how information /records are managed, can directly affect health services. The Northern Cape Department of Health is driven by Vision 2014, which diagrams the department's vital destinations, pointers and achievements that guarantee that administration methodologies are coordinated and conveyed with brilliance to the community.

The provision of district health services centres on a decentralized administration framework and a coordinated arrangement of social insurance administrations. Organising administration, which guarantees even-handed access to social insurance administrations, remains a need for the region. The Northern Cape Province is divided into five locales, namely Frances Baard, Pixley Ka Seme, Kgalagadi, Namakwa and Siyanda. This study used a clinic, which is a government/public organisation, and a primary health care facility that provides HIV, AIDS and TB-related treatment. The clinic centre has community-oriented primary healthcare programs that work proactively across their scope to improve family health and wellbeing. The figure below shows the organisation structure.
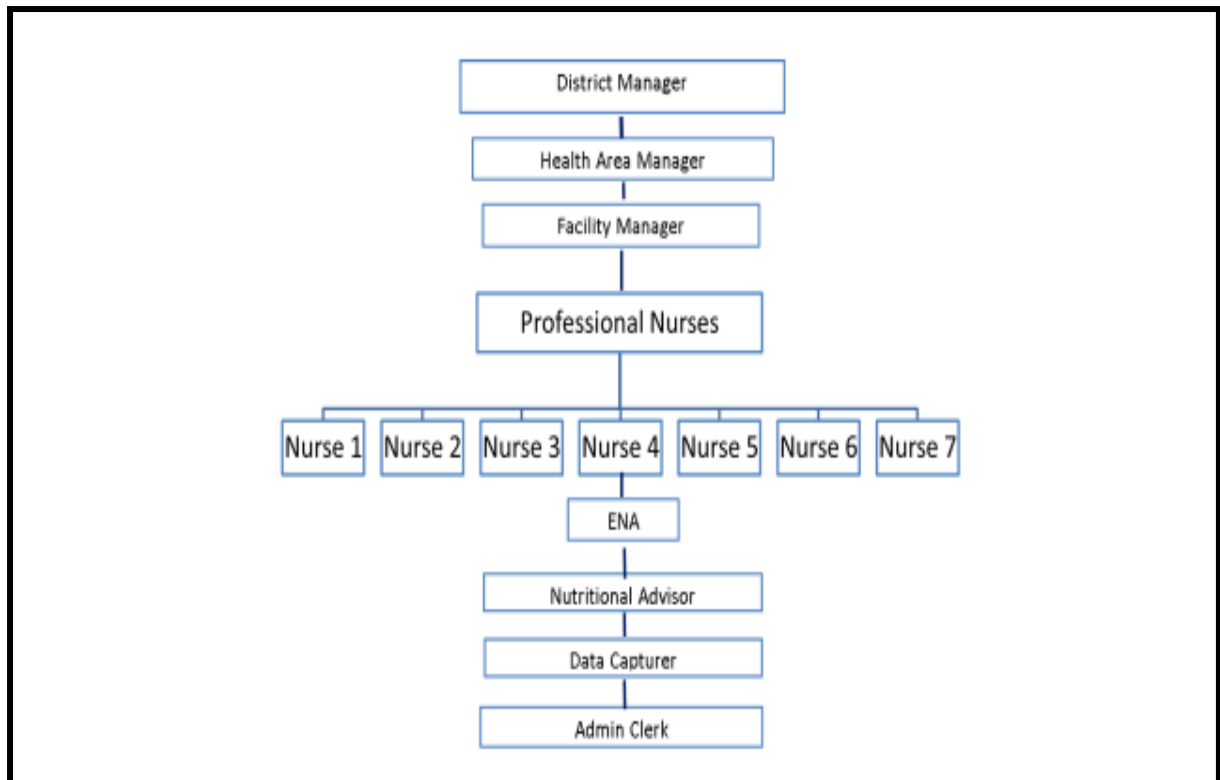
Figure 2.1: *Typical organogram (diagram by author)*

The clinic that the study used provides health care services to the following surrounding areas:

- Letlhakajaneng;

- Madula Ranch;

- Kampaneng; and

- Maseohatshe.

The core business of branches entails (but is not limited to):

- Minor ailments - defined as a health complaint, which patients can handle themselves through simple actions (Welle-Nilsen *et al.*, 2011);

- Antenatal care: spares the lives of mothers and children by advancing, building and establishing good health before childbirth and the early postnatal period, which is a period of the highest risk (Lincetto *et al.*, 2006);

- Family planning: allowing individuals and couples to achieve their desired number of children, and spacing and timing them by using modern or conventional (also called natural) contraceptive methods;

- HIV and AIDS: HIV is recognised as being the Human Immunodeficiency Virus;

- AIDS is the Acquired Immune Deficiency Syndrome. This is when the immune system becomes severely weakened, and a specific set of pathogens and malignancies arises;

- STI: Sexually Transmitted Infection;

- TB: Tuberculosis;

- Chronic diseases: these are diseases, which persist over time, progress gradually, cannot be resolved spontaneously, and h cannot be cured; and

- Immunization: is a mechanism through which a person is immune or resistant to an infectious disease, usually through vaccination. Vaccine activates the body's own immune system to protect the person from further disease or illness.

2.4 Project Management in healthcare sector

Project Management is the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements, achieving quality and performance goals usually regarding defects, schedule, resources and cost restriction. According to a guide to the project management body of knowledge from the Project Management Institute (PMI, 2017), project management is accomplished through the suitable application and integration of the project management processes distinguished for the project. Project management empowers organisations to execute projects viably and efficiently.

Whether for trade or healthcare sector, all projects are often counteracted into stages, which are helpful in identifying discrete steps, assigning work and managing deadlines. Project Management Institute (PMI, 2017), formally characterizes these stages using five 'process-groups'. These five process groups (initiating, planning, executing, monitoring and controlling lastly closing) compose the lifecycle of a project and as each stage is completed, it triggers the subsequent process group to start. The first stage in the project life cycle is the initiating phase which happens when a project is initiated, targets and scope are recognized and sponsorship, endorsement and subsidizing are granted. The initiation stage is also a preliminary evaluation of ideas and the association risk that the project might impose on the project organization and customer (Kerzner, 2017:69) this is then followed by the second stage called the planning phase (PMI, 2017). Planning is where all the project planning occurs, including identifying project tasks, schedule, resources, budget and last deliverables.

According to Kerzner (2017:69), the planning phase is mainly a refinement of the elements in the conceptual phase and requires a firm identification of the resources required and the establishment of realistic time, cost and performance parameters. When the initiation and planning stages are completed, the subsequent process is the execution phase. Executing

Phase is the action phase where the project plan is implemented, and deliverables are produced. This stage is where the work is done. Whereas groups work asynchronously, the shared PMIS provide perceivability into what work is accomplished and updates in real time as a team members' mark off completed tasks and upload work items directly to the program. Kerzner (2017:70), stated that almost all documentation must be completed in this phase.

As the project life cycle reaches its climax stage, the next phase is the monitoring and controlling phase. This is the only stage that interacts with all four other stages whereas the opposite stages are completed in sequential order. Amid this stage, everything within the project is observed to guarantee it is working according to the projects' schedule and scope and the project manager keeps the team motivated. The monitoring and controlling phase intrinsically revolve around the analysis of the deviations and discrepancies which impact the work and adjusting the project accordingly (Kerzner, 2017:70).

Lastly, in order ascertain the completeness of the project life-cycle the closing phase takes place. Closing Phase is when the project is deemed to be completed, lessons learned are accumulated, project completion approval is retrieved, and the final report is completed. According to Kerzner (2017:72), project closure phase evaluates the effort of the total system and serves as input to the conceptual phases for new projects and systems.

2.4.1 Project management failure and success factors

Project failure is high yet what establishes failure is dependent upon the rule being utilized to assess the projects. Consequently, despite the existing literature in the field on what constitutes project failure; there has been no consensus on the success/failure criteria (Frefer et al., 2018:4). Damoah and Akwei (2017:46), stated that, "the worst performance criterion is meeting the projected time, followed by cost, deliverables, stakeholders' satisfaction, contribution to national development and contributing to the sector where project is implemented, respectively". Executive support is important in project success. The Project Management Institute(PMI) addresses this factor in its 2018 pulse of the Profession in-depth report, it stated that "actively engaged executives help organizations bridge the communication gap in order to significantly increase collaboration and support, as well as boost project success rate and reduce risk" (Project Management Institute, 2018). Effective project sponsors support utilizes their influence inside an organization to effectively overcome difficulties by communicating project alignment with strategy, eliminating detours and driving organization change. With this reliable commitment and contributions, the momentum of the project will remain consistent and stable and achievement is almost certain. Hughes et al. (2017:146), have highlighted the following as traditional categories of

failure from the literature and further went on to present a new fourth category titled expectation failure. The traditional categories of failure comprise of correspondence failure which is when a system is not meeting its objectives, followed by process failure synonymous with system not delivered or is delivered yet failed to meet the defined criteria. The third category of failure is the interaction failure which happens when a system is not embraced by partners and benefits not realized. The fourth presented category titled the expectation failure is when a system is not addressing requirements and fails to meet the expectations and desires of stakeholders (ibid).

There is an extensive number of factors that influence the success and failure of projects. Critical success factors (CSFs) of project management are : "Quality, Time, Cost, Health Safety and Environment, Scope, Customer' Satisfaction, Efficiency of use of resource, Effectiveness Productivity, Profitability, Shareholder satisfaction, Experience gain from the project, Achievement of project's objective, Sustainability and Reliability" (Matoug et al., 2018:817).The idea of CSFs is that some factors are so critical that they should be overseen effectively for the project to be successful; these factors must be tended to adequately for the organization to be effective and successful. Project organizations are vigorously dependent on their deliverables to be creative and innovative and create value (Keeys & Huemann, 2017:1197). Organizations that implement the most advanced technologies and the best techniques to monitor their resources obtain a competitive advantage by assigning resources to the appropriate projects (Martens & Carvalho, 2017:1087).

Sustainability is an important objective of the project that complements other aspects of value and benefits. Sustainability is generally perceived through its three components, often alluded to as triple bottom line (economic, environmental and social sustainability). In the project business, the sustainability of the deliverables and the sustainability of the delivery process are both significant as they can have notable social and environmental impacts. Sustainable project management is particularly relevant for infrastructure projects that cause lasting change in the community and involve multiple stakeholders with different expectations (Kivilä et al., 2017:1172).

2.4.2 Project management practices

It is essential to integrate effective measures and statistical analysis into project management to minimize any chances of project failure. According to Kerzner (2015), the use of best project management practices leads to added business value, higher profit realization and better profit management activities. Project management practices are required to ensure project success (Badewi, 2016:774-775).

Project-based work is ubiquitous in all sectors of the world economy (Schoper et al., 2018:71) and interest in project management has grown considerably in recent decades (Geraldi & Söderlund, 2018:56). Project management practices has improved in project execution according to iron triangle measures (i.e. scope, cost and time), however much less in terms of meeting desired project benefits (Zwikael & Meredith, 2018:482). The effectiveness of project management is evaluated through the iron triangle, which includes completion on time, within the specified budget and with the specified quality (Mir & Pinnington, 2014:213).If a project is not scheduled, meaning the tasks have not been completed within the original scheduled time-frame, this is likely to have an impact on the overall cost, particularly if resources and staff are incurring actual costs for the project. Secondly, if project management performance is assessed as a single construct, it is not possible to identify the causes of performance (Levin et al., 2018:38). As much as there is project life cycle to effectively manage projects, there are also other models which also need to be taken into consideration for managing patient records. The record life cycle model is discussed below.

2.5 Managing Records Model

This segment clarifies the key hypothesis that supports public sector record management in South Africa. A noteworthy worry of the continuum, in general, should be managerial proficiency. Records are not made to serve the interests of some future filer or history specialist, or even to achieve some critical choices or tasks for families; rather, they are created and figured out how to serve prompt operational necessities (Atherton, 1985). In 1956, Theodore Schellenberg propounded the record life cycle, depicting information (records) as going through numerous phases or stages much like a live organism (Isa, 2009: 35).
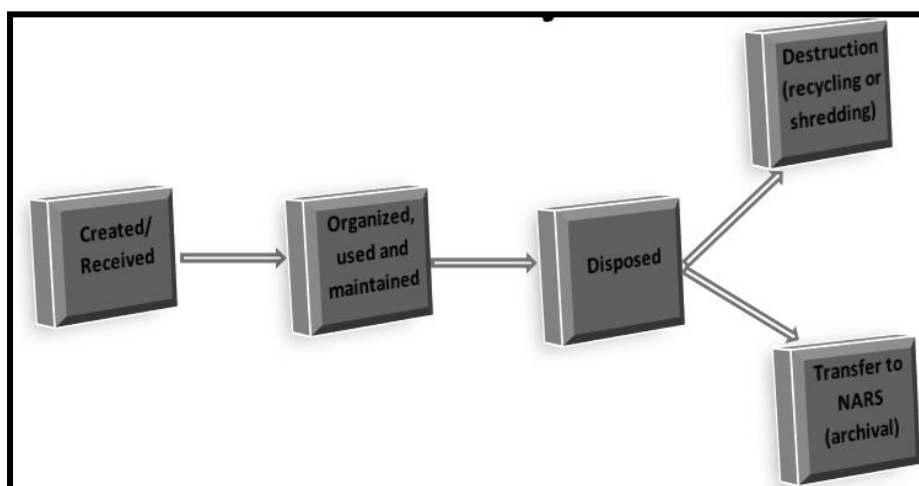
Figure 2 2: *Record Life Cycle* stage (National Archives and Records Service of South Africa, 2007)

The figure is explained below.

2.5.1 Created/Received

The health user's restorative information is made amid clinical assessment and care, and includes medicines provided by attendants and specialists. In the end, records are received by the recuperating office from the diverse counsel rooms and wards for legitimate keeping. This procedure of creating records happens when authorities release their day-to-day authoritative obligations, and workers receive the records to appropriately oversee them (Archives, 2007: 51-52).

2.5.2 Organised, Used and Maintained

At the point where patients have additional counsel or appointments, the specialists may ask for documentation from the previous consultation. This is because the document includes data from past visitations, care or solutions. Specialists likewise require documents to refresh the data identified with the present conference, as well as for remedy purposes. Specialists will utilize the document and give it back to the admin personnel for documentation and upkeep. This document may be maintained by recording in the correct stockpiling position, in addition to being characterized for simple recovery. Moreover, it would be stored far from presentation or perilous dangers like water and/or potential fire hazards. This would be the second phase of a record life cycle. It is the phase where records are kept by the director of records who records the executive's representatives. Government authorities and partners likewise utilize records at this stage (National Archives and Records Service of South Africa, 2007). Tsabedze *et al.* (2012) mention that to guarantee appropriate support of records, all related data must be accumulated, and legitimate methodologies executed before the records are finalised, since this data will decide the way the records are captured. This relates to them being either manual or mechanized.

2.5.3 Disposed

Keller (2009) states that record mien is a significant component of records management and is the last operational move within the record lifecycle. Aura may incorporate the decimation of records or the exchange of records to another substance (most normal documents) for permanent preservation. The doctor's facility will choose, which records should be kept for all time, and those that need to be kept for a short period. A conclusion usually relies on, for instance, bureaucratic, lawful, as well as financial analysis of the form of record. In the record life cycle, the third stage is disposal, which drives the life of the record to its end.

Records are assessed at this stage to decide their maintenance esteem, utilizing records transfer plans. This prompts safeguarding and/or obliteration of the medical record, contingent upon an estimation of the record (Archives, 2007: 51-52). As indicated by Tsabedze et al. (2012), when the essential estimation of records of an organisation slips, at that point they are viewed as idle, hence the prerequisite to decimate fleeting records that take up significant office space, and to transfer vital records to archives. It is basic to archine them, since numerous records can be wrongfully obliterated or improperly put away, presenting records to robbery and negative stockpiling conditions that may result in their crumbling and ensuing loss of essential public information.

2.5.3.1 Destruction (Recycling or Shredding)

Records that are destroyed are those that will never again be required for the same reasons for which they were made. They are moved from the records centre to the archives, where they are saved for posterity, or are shredded or destroyed as per instruction of the disposal authority. The South African government's departments move their records to provincial archives for protection, while they seek endorsement from the national archivist for those they need to destroy.

2.5.3.2 Transfer to NARS (Archival)

The NARS Act underlines that records must be discharged if the administration body is issued with a composed transfer authorisation by the national archives and records service of South Africa. A genuine case of record transfer occurs when there is an exchange of records to the chronicles store, or when records are wrecked or eradicated on the off chance that they are electronic.

2.6 Legislative Framework governing medical records

Great administration alludes to how government embraces capacities and exercises in a proficient, straightforward and responsive way in which residents partake and draw in with the legislature in the quest for their commonly social, political and financial destinations. The Batho Pele Principles, the South African Constitutional Act, No 108 of 1996, as well as NASAA (No 43 of 1996), are discussed below. To guarantee a fitting, reliable degree of information security for patient records, proper and secure management of records practices alone do not guarantee regulatory compliance. South African health care organisations must comply with the South African National Health Act (SANHA) and with the Electronic Communication Transaction Act (ECTA).Other legislative frameworks in South Africa govern both private and public organisations such as the promotion of the Administrative Justice Act

and the Promotion of Access to Information Act, have complemented the requirements for sound record keeping.

2.6.1 Batho Pele principles

The "Batho Pele Principles" provide a standard framework that outlines how public services should be provided to improve the proficiency and viability of the public service. Adherence to these standards will ensure the arrangement of great administrations that address the general population's issues and expectations, upgrading consumer loyalty, and maintaining the government's guarantee/promise that access to better than average public services will never again be a benefit that only a few receive. Instead, these standards ensure that the rightful and legitimate expectations of all natives are addressed. The "Batho Pele Policy comprises of eight service delivery principles", as summarised below.

2.6.1.1 Consultation

"Citizens should be consulted about the level and quality of public services they receive and, wherever possible, should be given a choice about the services that are offered" (White Paper, 1997)*.*

All national and common divisions must consult frequently and methodically about services presently provided, as well as about the provision of modern fundamental administrations to those who lack them. To obtain data from users of services, one may conduct interviews with individuals and/or meet with consumer representative bodies and NGOs, including bodies that represent formerly disadvantaged groups.

2.6.1.2 Service standards

"Citizens should be told what level and quality of public services they would receive so that they are aware of what to expect"(White Paper, 1997)*.* The subsequent principle centres on ingraining service standards in the public sector. National and common divisions must distribute benchmarks for the level and nature of the administration, including acquainting/familiarizing new administrators with information that they were previously denied access to. In health regions, for instance, requirements are probably set for a maximum time that a patient needs to wait at a primary health care sanatorium, or for a non-urgent operation. With these principles and/or standards in place, citizens are supplied with an indication of the nature of administration conveyance that they can anticipate.

2.6.1.3 Access

"All citizens should have equal access to the services to which they are entitled" (White Paper, 1997)*.* Equal access will improve both urban and rustic communities' access to the most recent public sector policies and network gatherings.

2.6.1.4 Courtesy

"Citizens should be treated with courtesy and consideration" (White Paper, 1997).The public service focuses on ceaseless, legitimate and straightforward correspondence with residents. This comprises correspondence that deals with administration, items, data and issues, which may hinder or postpone the effective conveyance of administration for guaranteed guidelines.

2.6.1.5 Information

"Citizens should be given full, accurate information about the public services they are entitled to receive" (White Paper, 1997)*.* Composed data should be plain and free of jargon, and bolstered by graphical material, which will make it clearer. It should not be expected that composed data alone will be sufficient; numerous individuals want to obtain data verbally, with the goal that they can pose inquires and check their comprehension.

2.6.1.6 Openness and transparency

"Citizens should be told how national and provincial departments are run, how much they cost, and who is in charge" (White Paper, 1997)*.* This guideline energizes the spread of data to the overall population in terms of the capacities and responsibility obligations of different government spheres, and how their work synchronizes with each other.

2.6.1.7 Redress

"If the promised standard of service is not delivered, citizens should be offered an apology, a full explanation, and a speedy and effective remedy; and when complaints are made, citizens should receive a sympathetic positive response" ('White Paper', 1997)*.* The precept of redress requires a proficient and successful approach to deal with taking complaints, which should be seen as a change to recognise and address issues and improve service delivery in the public sector.

2.6.1.8 Value for money

"Public services should be provided economically and efficiently in order to give citizens the best possible value for money" ('White Paper', 1997)*.* Cultivating service conveyance and

broadening access to public service to every single South African must be accomplished to diminish public expenses and for a cost-effective administration. The Batho Pele ingenuity must be conveyed inside departmental resource distributions, and the rate at which administrations are improved will then be fundamentally influenced by the speed with which national offices accomplish productivity investment funds, which can be furrowed once again into improved services.

2.6.2 National Archives and records service of South Africa Act (NARS Act)

The South African national archives, as well as the country's records services, are crucially important. This is the government organ that is charged with the best possible administration, management and care of the records of governmental bodies; and the conservation and utilization of a national chronicled legacy (NARS Act, Number 43 of 1996 as changed). Yuba (2013) and other scholars such as Ngoepe (2004) agree and point out that NARS has an essential duty regarding the administration of records of the legislature. According to section 13 of the NARS Act, the national archivist will be charged with proper, correct administration and care of open records in the guardianship of legislative bodies. This centre capacity involves making the NARS effective, responsible and straightforward through the correct administration and care of records that are still in the ownership of legislative workplaces. It is the NARS's responsibility to ensure structural, efficient and effective record management in all government bodies, and it is their legal responsibility/duty to ensure that records are handled properly in the public sector.

The national archives should be completely associated with, or informed of any new advancement in executive records. In wellbeing establishments, the office should endorse and direct from the country's national archives when they develop a new records framework or improve the current records framework. The management and care of records section (National Archives And Records Service Act (Act No. 43 Of 1996) of the guideline expresses that the leader of the administration body must guarantee that records receive appropriate physical consideration, and have compelling safety efforts set up. It is imperative that they are guaranteed that records are overseen accordingly, and by enactment. The records should also convey data that identify their area of specialization for archiving purposes.

Moreover, the guideline additionally provides direction for records order, microfilming and transformation to electronic record keeping. It likewise expresses that the administration body must guarantee that the national archives affirm their records arrangement framework, as well as its alterations, before they consider utilizing it. The body should likewise use suitable methodology to report to the national archives when planning to actualize records microfilming or electronic records.

According to Ngoepe (2004), to ensure that the board affords records the merits that they deserve, this should be a priority goal in the legislative body's key and marketable strategies. Undoubtedly, NARS is a fundamental instrument to upgrade taxpayer supported organization conveyance successfully. Given the reliance of legislative straightforwardness and responsibility on open records, and the job of the NARS in forming and holding social memory, NARS makes a huge commitment towards the more extensive democratization of South Africa.

2.6.3 South African Constitutional Act (No.108 of 1996)

South Africans are always reprimanding the genuine lack that exists in open administration conveyance. The country's 1996 Constitution obliges government to perform open organization in a compelling and effective way, regarding specific established solutions, and the Bill of Rights (Van Heerden, 2009: 47). Nonetheless, the simple presence of an equitable Constitution with a Bill of Rights does not really imply that open authorities apply naturally essential rights, or exercise open organisation in the unavoidably recommended way. Open authorities can apply such rights and exercise open organisation as far as the established mandate if they are familiar with the Constitution and the Bill of Rights. This clearly introduces a huge test in light of the fact that the absence of adequate learning of the protected mandates, much like preparing, could be a hindrance. This may add to the disappointment with respect to open authorities to understand their established duties and accountabilities to convey viable and effective open administration conveyance, as well as discontinuity of open administration, centralisation, and a failure to take care of results.

Section 32 of the South African Constitution of 1996 assures the privilege of access to data in the country. In light of Section 32(1) of the South African Constitution, "*everybody has the privilege of access to – any data held by the state; and any data that is held by someone else and that is required for the activity or insurance of any rights*". The Constitution maintains uniformity of rights among all natives, and looks to construct a public in which incapacitated people can likewise appreciate and profit from equal rights. Those legislatures progressively perceive the significance of data for responsibility and administration, whilst overseeing it in a viable way. Access to data stays one of the key rights in South Africa, as stipulated by Section 32 of the country's Constitution.

2.6.4 Promotion of Access to Information Act (No.2 of 2000)

The requirement for successful records of executives is upgraded by promotion of the Access to Information Act, since legislative bodies have to give data of their records to general society on solicitation, and to ensure individual protection. The inspiration to offer impacts on the one hand accessing data to cultivate a culture for straightforwardness and responsibility, and to advance a public, where the general population of South Africa has successful access to data to empower their rights. Should an administrative body not have the option to give the correct data at the opportune time when mentioned, the natives' rights to take an interest in the leadership procedure would be influenced unfavourably. Again, solid records is of basic significance for the use of arranging this act.

2.6.5 Promotion of Administrative Justice Act (No.3 of 2000)

The Promotion of Administrative Justice Act is to guarantee that authoritative activity is "legitimate, sensible and reasonable", and, furthermore, to guarantee the best possible documentation of these activities, as per segment 33 of the South African Constitutional Act, 1996. Heads of administrative bodies are committed to guaranteeing that their staff compile records that are real and solid, and as proof of their business choices.

2.6.6 Electronic Communication and Transaction Act (No.25 of 2002)

The Electronic Communication and Transaction Act accommodate assistance and guidelines for electronic correspondence and exchanges to: encourage and guarantee a transition to electronic administration conveyance; and accommodate the improvement of a national electronic-system for South Africa. In terms of this Act, electronic correspondence and exchange records are permissible by structure, and are acceptable as proof in courtrooms. Government bodies are, by suggestion, urged to actualize electronic frameworks with the end goal for correspondence and exchanges with other public bodies, private bodies, and natives. The electronic records of the executive framework should be planned so that components such as security, honestly and validity, are of essential concern. The Act promotes the use, creation and acceptance of electronic communication and transaction records.

2.6.7 National Health Act (No.61 of 2003)

The primary point of the National Health Act is to realize consistency, and to head the nation's wellbeing administration routine, as stipulated and commanded in the constitution, and different laws at various degrees of administration conveyance. This expresses that individuals responsible for the wellbeing administration establishment are made and kept at

that Wellbeing Foundation for further administration conveyance, as commanded by the National Archives and Records Service of South Africa (Act No. 43 of 1996), and promotion of Access to Information Act. It further stresses that wellbeing data concerning various patients should remain private, except if legally necessary, or if the proprietor of the data agrees to reveal the data.

2.7 Theoretical framework

Theories are required because they explain how a topic is studied; clarify key assumptions; organize knowledge; provide predictability and facilitate understanding (Bourke et al., 2010). This study first discusses general theoretical approaches in section 2.7.1 and further articulates the theoretical frameworks that have influenced the conceptual work of the present study in 2.7.2.

2.7.1 General theoretical approaches

In research relating to Information Systems/ Technology, most of the researchers focus on several theories such as Technology Acceptance Model (TAM) (Davis, 1989), Theory of Planned Behavior (TPB) (Ajzen, 1991) and Diffusion of Innovation Theory (DOI) (Rogers, 1995)and Critical Success Factors (CFSs) (Rockart, 1979) . The Electronic patient records management systems have been used as a successful method for managing patients' medical records globally. However, there is a slow adoption of electronic patient's record management in South Africa as patient medical records are still being written on paper and kept in filling room. Moreover, it is imperative to look into different theories suitable for this study; the first theory taken into consideration is referred to as the Technology Acceptance Model (TAM) followed by Theory of Reason Action (TRA), then Theory of Planned Behaviour (TPB), Critical Success Factors (CFSs) as well as Diffusion of Innovation Theory (DOI). These theories are evaluated in explaining user technology adoption.

Technology Acceptance Model (TAM) has been widely recognized as explaining users' intention to use technology, it has further been extended to become Technology Acceptance Model 2 (TAM 2) (Venkatesh & Davis, 2000), Unified Theory of Acceptance and use of Technology (UTAUT) by (Venkatesh et al., 2003) and Technology Acceptance Model 3 (TAM 3) (Venkatesh & Bala, 2008). Despite this great evolution of TAM, it is not suitable for this study as its applicability on mandatory systems is not relevant, the EMRs/HERs is regarded as a mandatory system for clinics/hospitals. Technology Acceptance Model (TAM) suggest/state that the attitude towards accepting a new system is dependent on its perceived ease of use. Davis (1989) defines perceived ease of use as "the degree to which a person believes that using the system will be free of mental effort". Further, Rogers (1995)

discussed that if the technology is more complicated than the existing ones the adoption of any innovation will not be supported. The technology acceptance model is diagrammatically presented in figure 2. below for easy reference.
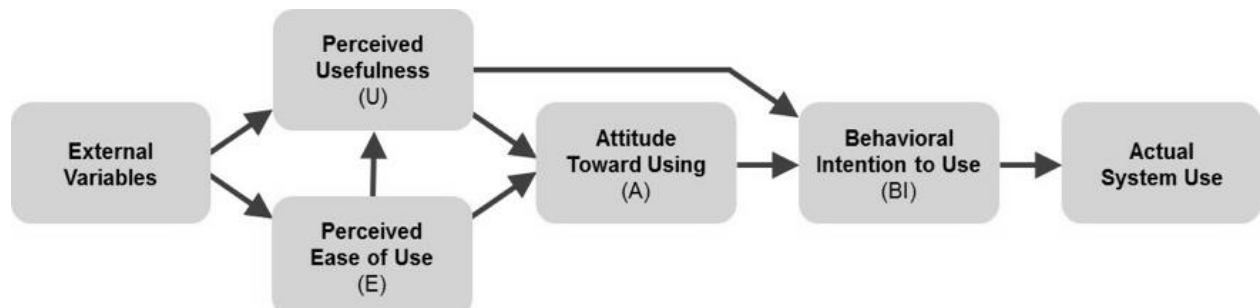
Figure 2 3:*Technology Acceptance Model (TAM)* (Davis, 1989),

In contrast to technology acceptance model which its application is mandatory, the Theory of Reasoned Action (TRA) by Fischbein & Ajzen (1975) shows that technology acceptance is determined by one's intent to use technology (behaviour) and the influence of others on using the technology (*subjective norm* or *social influence*). Based on Theory of Reasoned Action, Davis & Venkatesh (1996) developed the Technology Acceptance model to investigate factors that cause people to accept or reject an information system. TRA then evolves to become Theory of Planned Behaviour. The Theory of Planned Behaviour (TPB) predicts that planned behaviours are determined by behavioural intentions which are largely influenced by individual's attitude towards a behaviour, the subjective norms encasing the execution of the behaviour, and the individual's perception of their control over the behaviour (Fischbein & Ajzen, 1975). Due to comparatively low adoption rate of Electronic record management systems in South Africa this theory was considered to be ideal in this study, as the selected public healthcare facility used in this study still use manual patient record management system. The Theory of Reasoned Action as presented in figure 2.4 below helps clarify the differences between TAM and TRA.
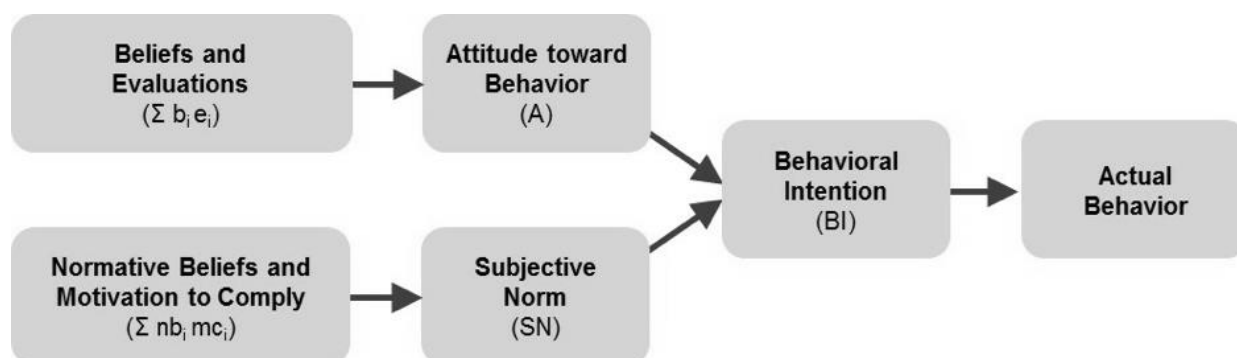
Figure 2.4:*The Theory of Reasoned Action (TRA)* (Fischbein & Ajzen, 1975)

Since some healthcare facilities in South Africa still use manual patient record management system, critical success factors (CSFs) are important for the success of any system as this study focuses on Electronic Medical Records (EMR) as a system that can be adopted to improve on the overall system in healthcare, the CSF theory is quite relevant for use in the current study. Some Critical Success Factors have been discussed in section 2.4.

Lastly, the Diffusion of Innovation (DOI) theory explains the way individuals or users and groups adopt new ideas (Rogers, 1995).The diffusion of innovation theory attempt(s) to understand the influence of adopting innovation and reasons why people are resistant to changes. DOI theory concludes that learning and communication processes influence the adoption of an innovation. This theory was considered to be ideal in this study because this theory includes various level of analysis for instance, for an individual, organization and groups.

In an effort to identify relevant theories suitable for the adoption of information technology (IT), the researcher identified and discussed different theoretical frameworks, namely; Theory of Reasoned Action (TRA), Theory of Planned Behaviour (TPB) and Diffusion of Innovation Theory (DOI) and Critical Success factors (CSFs) and their relevance to the current study. The process of identifying the theoretical framework(s) underpinning this study was guided by the research objectives, research questions and hypotheses of the study, section 2.7.2 discusses the theoretical framework(s) adopted for this study. The table below shows a brief summary of different Theories in IT implementation and their relevance/irrelevance to the study.

Table 2 1:Theories on IT implementation

Authors	Level of Analysis	Theory	Brief Description	Relevance of IS Theory for this Study
Venkatesh and Bala (2008)	Individual	A theoretical extension of TAM (TAM3)	"Combination of TAM2 and the determinants of Perceived Ease of Use (PEOU)"	Not relevant for this study
Venkatesh *et al.* (2003)	Individual	Unified Theory of Acceptance and use of Technology (UTAUT)	"This comprises of a combination of eight models: TRA, TAM, TPB, DOI, Social Cognitive theory, Motivational model, a combined TAM and TPB model and PC utilization model that explains usage intention"	Not relevant for this study
Tjan (2001)	Organisation	Fit-viability Theory	"An extension of the TTF model with the removal of the individual construct. Fit and viability are considered to affect technology performance"	Not relevant for this study
Venkatesh and Davis (2000)	Individual	A theoretical extension of TAM (TAM 2)	"Develops on TAM to include social influences and cognitive instrumental processes that is conceived to have significant influence on user acceptance"	Not relevant for this study
Dixon (1999)	Individual	Information Technology Adoption Model (ITAM)	"Builds on TAM and provides a framework for implementation and evaluations with a focus on individual users to predict the adoption of voluntary information technology"	Not relevant for this study
Rogers (1995)	Group Firm, Industry Society	Diffusion of innovations Theory (DOI)	"DOI theory perceives innovation as being communicated through certain channels over time and within a particular social system. Individuals are seen as possessing different degrees of willingness to adopt innovation and thus it is generally observed that adopting an innovation is approximately normally distributed over time"	Relevant for the study
Goodhue and Thompson (1995)	Individual	Task Technology Fit (TTF)	"IT is more likely to have positive impact on individual performance and be used if the capabilities of IT match the task that the user must perform"	Not relevant for this study
DeLone and McLean (1992, 2003)	Individual, Organization	DeLone and McLean IS success	"A multimedia measuring model to comprehend IS success"	Not relevant for this study
Ajzen (1991)	Individual	Theory of Planned Behavior (TPB)	"TPB posits that individual behavioural intentions are a function of an individual's attitude toward the behavior, the subject norms surrounding the performance of the behaviour and individual's perception of ease with which the behaviour can be performed."	Relevant for the study
Barney (1991)	Capability, Firm	Dynamic Capabilities	"Emphasizes that improvement is a continuous process to assure sustained competitive advantage"	Not relevant for this study
Davis (1989)	Individual	Technology Acceptance Model (TAM)	"Based on TRA. Theories that perceived usefulness and perceived ease of use determine an individual's intention to use a system with intention to use serving as a mediator of actual system use"	Not relevant for this study
Bandura (1986)	Individual, Group	Social Cognitive Theory	"Provides a framework for understanding, predicting and changing human behaviour. Explains individuals' reaction to computer technology"	Not relevant for this study
Rocktart (1979)	Individual, Group, Organization	Critical Success Factors (CFSs)	"Determines the essential factors that an organization must have to enable success project implementation"	Relevant for the study
Bostrom and Heinen (1977)	Organization, Employees, Environment	Socio-technical system theory	"Consideration of the human factor in system design"	Not relevant for this study
Fishbein and Ajzen (1975)	Individual	Theory of Reasoned Action (TRA)	"TRA suggests that individual behaviour is driven by behavioural intentions and subjective norms surrounding the performance of the behaviour"	Relevant for the study
Fiedler (1964)	Firm, Individual	Contingency Theory	"Posits that there are no best practices in organization design. The design of an organization must fit between the organizational subsystem and business environment"	Not relevant for this study y

2.7.2 Theories underpinning the current study

Theories and models play a very important role in research because they help the researcher explain phenomena and draw conclusions that will facilitate the development of new theories (Howell, 2013). For this study, the researcher discussed general theoretical approaches in section 2.7.1 and summarized in table 2.1 above. However, when taking into consideration the research problem, research objective, research questions and hypotheses that guide this study, only the most relevant and highly suitable theories underpinning the current study are articulated in this section. These theories help to explain the research purpose of the study conducted to determine whether the current paper-based filing system used at a public clinic in the Northern Cape Province increases or diminishes the efficacy of service delivery in patient care; and the findings of the study are discussed which led to conclusions drawn in the study. For this study the theoretical frameworks adopted are diffusion of innovation theory and the record continuum model in accordance to the life cycle record.

2.7.2.1 Diffusion of Innovation Theory (DOI) Theory

The selected public healthcare facility used for this study currently utilizes manual patient records management system due to individual's attitude, perception and social influences towards technology. Diffusion of innovation theory can be adopted as tool to establish effective communication channels at the healthcare facility when opting for technology system for managing patient records. Rogers (1995) define diffusion as the process by which an innovation is communicated through certain channels over time among the members of a social system and innovation as an idea, practice or object that is perceived as new by an individual or other unit of adoption. Rogers described the five stages of the adoption process being knowledge persuasion, decision, implementation and confirmation. Rogers (1995) found five user-perceived attributes that consistently proved to be determinants of success of an IT innovation and have a potential to influence an individual's decision to implement and innovate, namely relative advantage, compatibility, complexity, trialability and observability.

Relative advantage is the degree to which the user perceived benefits or improvement on the existing technology by adopting an innovation. Compatibility captures the extent to which an innovation is consistent with the existing technical and social environment. The more an innovation can integrate or coexist with existing values, past experience and the need of potential adopters, the greater its prospects for diffusion and adoption (Tornatzky & Klein,

1982). Complexity measures the degree to which an innovation is perceived to be difficult to understand, implement or use. An innovation that is less complex is more likely to be accepted by end users (Tornatzky & Klein, 1982). Trialability is the ability of an innovation to put on trial without total commitment and with minimal investment. An innovation with higher trialability is more likely to be adopted by individuals. Lastly, observability is the extent to which the benefits of an innovation are visible to potential adopters. Only when the results are perceived as beneficial, will an innovation be adopted (Tornatzky & Klein, 1982).

In connection to the five attributes discussed above, two of the objectives of the study were to understand the awareness of personnel with regards to information management technology and to identify the benefits and challenges of the paper-based filing system, and electronic filing at the selected public healthcare facility. The researcher sought to understand the social norm(s), the individual perceptions about the benefits of electronic medical record, and the degree to which respondents believes that using the system will be free of mental effort. In addition, the first hypothesis of the study, was to understand the respondents perceived benefits for using technology to manage patient records. Hypothesis 1 of this study was, the null Hypothesis 1 (H0): There is independence between patients (health users) and clinical staff members regarding benefits of computerizing patient records at a selected public healthcare facility. Further, the alternative Hypothesis 1 (HA): There is dependence between patients (health users) and clinical staff members regarding benefits of computerizing patient records at a selected public healthcare facility. The hypothesis of this study has a bearing on the theory adopted in the study, Diffusion of Innovation Theory. Moreover, diffusion of innovation theory is more comprehensive in providing in-depth conceptual framework about the influences of socio-technical factors on adoption. In addition, it covers important factors of adoption of health care innovation for instance, attributes of innovation, adopter's characteristics and communication channels. Therefore, Rogers' DOI theory was selected as a theoretical framework for this research.

2.7.2.2 Record Continuum Model framework

Within the context of the study about records, recordkeeping and the development of effective medical record systems, the Record continuum Model (RCM) is adopted in this study as a theoretical framework in accordance with Record Life Cycle Model. Since both Models outline and discusses dimensions and steps for record management respectively, an integrated approach merges the two theories to complement each other. Record Life Cycle was developed by Theodore in 1934, this model is discussed in section 2.5 .and the Record

Continuum Model was developed in the 1990s by Monash University academic Frank Upward.

The aim of the RCM is to provide a framework for conceptualizing recordkeeping and archiving as a process that 'fix documents which are created in the human interaction of all kinds and preserve them as evidence of that activity by organizing them from their immediate context of creation, and providing them with ever broadening layers of contextual metadata' (McKemmish, 2001). In the continuum model the stages that the records undergo are recurring and reverberating activities that fall both within archives and record management(Upward, 2000). The RCM constitute of four dimensions and these include 'create', 'capture', 'organize' and 'pluralize'. The model highlights the need to; develop interconnected methods for document creation; establish and maintain the routines within which documents are captured as records and controls different processes involved in organizing document and records as an archive (Upward, 2000) .
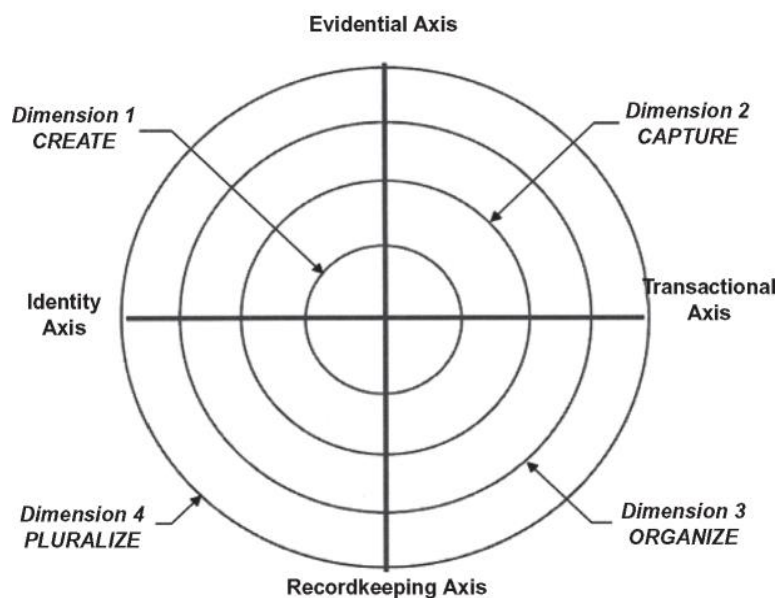
Figure 2 5: *Record Continuum Model* (Upward, 2000)

Reed (2005) presented the four dimensions of the continuum model as shown in the diagram above, which are create (dimension 1), capture (dimension 2), organize (dimension 3) and pluralize (dimension 4). Dimension one which is 'create' relates to the business activities that generate records; the second dimension is to 'capture', this dimension entails that the created record is communicated and acts as evidence of the transaction that took place during creation. The third dimension which is to organise, ensures that the record is given the necessary elements such as a metadata so that it will be available over time and lastly but not least the fourth dimension, pluralize, has to do with the broader social environment in which records are used by different stakeholders (Reed, 2005). As previously

stated, the healthcare facility used for this study, continues to use the manual patient records management system. The manual patient records known as 'patient folders' go through all the dimensions of RCM, from the time the patient visit the clinic for the first time, a folder is created for the patients and their information is captured and documented using patient name and surname, date of birth and so forth. After the patients' visit to the clinic, the patient record folder is organized and stored in a filing room so that it will be available over time, and this file is used by patient, nurses and administrative personnel/archivist.

For the 'pluralize' dimension, the archivist can be affected by types of training received. The second objective of this study was to determine the main reasons for misplaced folders that obstruct service delivery in a selected community healthcare facility. The researcher wanted to ascertain the level of employees' capability, skills, as well as training within the selected public clinic. Moreover, as records are organized to be; available over time, used and easily accessible, the researcher wanted to find out the timeframe for patient retrieval folders at a selected public healthcare facility; hypothesis 2 of this study, the null Hypothesis 1 (H0) stated that there is no statistically significant difference between the time patients wait before receiving medical folders compared with the time spent by clinical staff members retrieving medical folders. Further alternative Hypothesis 1 (HA): There is statistically significant difference between the times patients wait before receiving medical folders compared with the time spent by clinical staff members retrieving medical folders. The hypothesis of this study has a bearing on the theory adopted in the study, Record Continuum Model, which makes RCM suitable for this study. Theoretical framework in this study was mainly a combination of Record Continuum Model in accordance with Record life Cycle as well as Diffusion of Innovation Theory (DOI) The reason for combining theories is because it is difficult to realize the research objectives of this study using a single theoretical framework. In addition, integrating various theoretical frameworks aids in explaining complex phenomena underpinning this study.

2.8 Summary

The literature review covered related studies, dealing with information management of patients with reference to the purpose of information (record) management, electronic filing management, project management, the effects of technology on information management, and the benefits of proper information management in public healthcare. This chapter explored paper-based health records, as well as electronic health records, and their benefits and challenges. A records management model such as life cycle was discussed, and issues

relating to legislation and regulatory frameworks were also discussed. The next chapter details the research methodology adopted in the study.

CHAPTER 3: RESEARCH APPROACH AND METHODOLOGY

3.1 Introduction

The previous chapter discussed study-related literature. It included study-related in-patient information management with respect to information (record) management purposes. It also included management of electronic and paper filing as well as effects of technology on information management. Benefits of effective information management in public healthcare, and the legislative framework system that administers and/or governs the management of records in South Africa were also discussed. This chapter, chapter three considers the approach that the study used to examine records management at a selected healthcare facility. The chapter also provides the research paradigm of the study as well as the research process underpinning this study. The chapter also provides a brief summary of the research questions, aims and objectives guiding the current study as a way to guide the reader(s) to understand the problem that is being investigated by the study. The sampling technique as well as data collection instruments utilised in this study is also provided in a greater detail in sections 3.5 to 3.7 respectively. It conjointly describes the data analysis procedures with detail and ethical considerations taken into account in guiding the study.

3.2 Research paradigm

The concept of research paradigm is derived from Greek word "*paradeigma*" meaning "*pattern*" (Kivunja & Kuyini, 2017:26). In essence, research paradigms represent the "researcher's beliefs and values about the world, the way they define the world and the way they work within the world. In relation to this study, the researcher's thoughts and beliefs about the management of patient records and filing systems explored subsequently guides the study." In other words, the paradigm adopted direct the researcher' investigation which includes data collection and analysis procedures. In addition Kivunja & Kuyini (2017:26) further state that paradigm "is the lens through which a researcher looks at the world. It is the conceptual lens through which the researcher examines the methodological aspects of their research project to determine the research methods that will be used and how the data will be analysed".

The methodological aspect of a research should align with the ontological and epistemological stance of the research. The concept of Ontology concerns assumptions, as explained by Antwi & Kasim (2015:218) who described ontology as "the way the investigator define the truth and reality". Ontology according to Lincoln & Guba (2013:39) deals with

questions such as, "what is there that can be known?" or "what is the nature of reality?". In this study the researcher wanted to know the reality about the management of patient records and its processes at a selected public healthcare facility. The researcher wanted to find out if paper filing supports or diminishes the effectiveness of service delivery at a selected public healthcare facility. Whilst the concept of Epistemology concerns and/or deal with valid kind of knowledge, for instance Kivunja & Kuyini (2017:27) point out that the questions related to epistemology is, "is knowledge something which can be acquired on the one hand, or, is it something which has to be personally experienced?". For instance, in this study, the researcher wanted to personally investigate the status of patient management records that obstructs the provision of public healthcare services at the selected public healthcare facility to gain in-depth knowledge about the reasons for misplaced folders that hinder delivery of services at a healthcare facility. The dominant research paradigms that surround research are positivism, interpretivism and the critical realism paradigm (Christiansen et al., 2010).

This study is based on a positivist research philosophy. Gimbel (2016) define positivism as "the position that repudiates ontology (what things are in themselves, their nature or essence) in favour of epistemology (what can be known and tested)". Some authors associate positivism with quantitative methods (e.g. Babones, 2016). Matthews & Ross (2010), agree that positivism is an epistemological position which asserts that knowledge of social phenomenon is based on what can be observed and recorded rather than subjective understandings.

Adopting a particular philosophy can be considered as essential to the researcher's assumptions about the way in which they experience the world, in turn, underpins the research strategy and the methods selected (Saunders et al., 2012:128). Confirming to the positivism philosophy, the questionnaire was tested using Chronbach Alpha to test reliability of the questionnaire used in this study. A sample was drawn from Northern Cape Province in a selected public healthcare facility. As previously indicated, the questionnaire was essentially constructed with closed-ended questions, as it was believed that some guidance was required for the subjects. It contained one open ended question to allow some subjective input from the subjects.

3.3 Research process

The strategy and flow process that the researcher used for the collection, interpretation and reporting of data in order to complete the study. The flow process of this research is represented in the figure 3.1 below. Key elements in the process include patients, shown on

the left side of the figure, and employees, shown on the right side of the figure below. There was only one phase involved in the data collection, interpretation and reporting of the data indicated as the primary phase. Primary Phase, Figure 3.1 below illustrates the flow process of the research design.
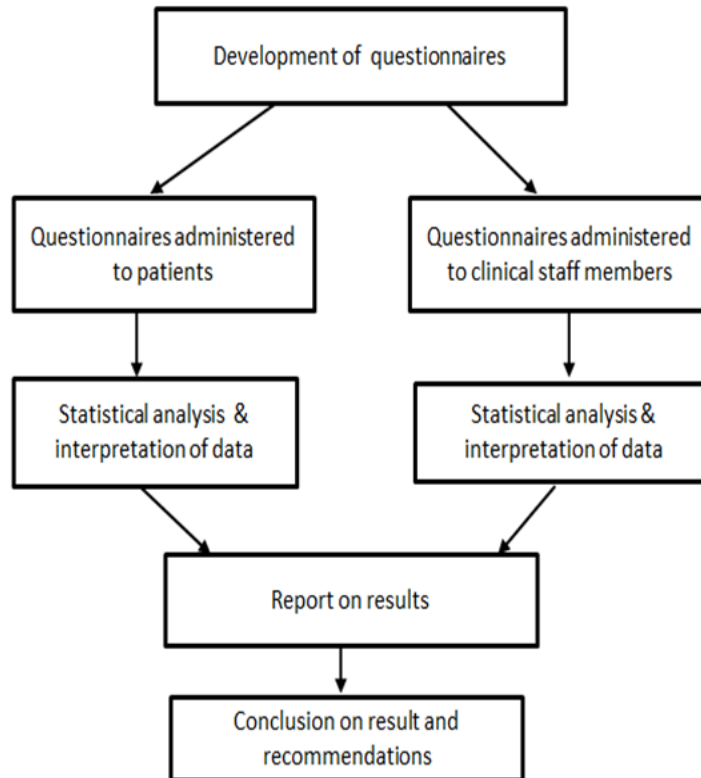
Figure 3 1: *Flow process of research design*

(Source: Author's own design)

3.2 Research questions and objectives

This research was guided by the research questions and research objectives to seek clarity in addressing the research problem. This study was conducted to determine whether the current paper-based filing system used at a public clinic in the Northern Cape Province increases or diminishes the efficacy of service delivery in patient care. In this regard, it is imperative to revisit the study's objectives, as shown below:

Table 3 1: *Summary of research questions and objectives*

Research Questions	Research Objectives	Data Collection Method
How do patient records obstruct the provision of public healthcare service at a selected public healthcare facility?	**Determine** the status of patient management records that obstructs the provision of public healthcare services at the selected public healthcare facility	Questionnaire
What are the main reasons for misplaced patient folders at a selected community healthcare facility?	**Identify** the main reasons for misplaced folders that hinder delivery of services in the selected community healthcare facility	Questionnaire
How would paper filing support or diminish the effectiveness of service delivery at a selected public healthcare facility?	**Assess** if paper filing supports or diminishes the effectiveness of service delivery at a selected public healthcare facility	Questionnaire
How does clinical staff perceive information management technology?	**Understand** the awareness of personnel with regard to information management technology	Questionnaire
What are the benefits and challenges of both paper-based and electronic filing systems?	**Identify** the benefits and challenges of the paper-based filing system, and electronic filing at the selected public healthcare facility;	Questionnaire
How can moving from a paper-based filing system to an electronic filing system improve healthcare work, as well as benefit patients' lives at the healthcare facility?	**Explore** the effects of technology on information management on health workers and patients at the public healthcare facility; and	Questionnaire
What are the required measures to improve daily processes to ensure best management of information, whilst improving efficiency at the public healthcare facility?	**Investigate** what modifications can be done to improve current daily processes at the selected public healthcare facility.	Questionnaire

3.4 Research approach for data acquisition (Quantitative)

The research study considered and defined principle and primary methods to ensure proper administration of the research. In selecting the research approach for this study, the researcher had to identify the "purpose, process, logic, and outcomes" expected in the study. Collins and Hussey (2009:3) assert that the exploration plan of any examination can be sorted by methods for its purpose, process, logic and outcome. The examination outline for this investigation is subsequently explained. In terms of purpose of the research**,** the examination was unmistakable in nature, as the investigation's primary expectation was to understand if the current patient record management system used at a selected public healthcare facility supports or diminishes the effectiveness of service delivery.

The research process of this study used a quantitative research and falls inside the ambit of the positivistic research worldview. Fundamentally, quantitative information was gathered from respondents by using the "questionnaire" instrument, utilizing closed and open-ended questions. In terms of research logic this examination was deductive in nature, as

perceptions of the creators (i.e. the examination issue) were detailed by counselling existing writing, which were then inspected by methods for exact perceptions. The research outcome of this investigation is regarded as fundamental research, as the principle aim is to reveal insights in respect to the utilisation of an electronic filing system to optimise patient management in a selected public healthcare facility. The outcome of this study should contribute to the existing body of knowledge with regard to the effects of technology on information management in healthcare.

3.5 Research Design and methodology

Research design is a means to gather, dissect ad translate information to comprehend a topic. According to Leedy and Ormrod (2015), research design is occasionally confused with social norms, and other procedures for recording and collection of data. Furthermore, Leedy and Ormrod (2015) mention that researchers use research methodology to complete the exploration venture/project, and that this methodology dictates the specific instrument that the research chooses. The examination procedure is efficient in characterising the goal, dealing with information, and conveying discoveries that occur in established structures and as per existing rules. The structures and rules provide the scantiest of signs of what to incorporate into the examination, how to play out the exploration, and what kind of deductions are likely founded on the gathered information.

There are a few research techniques that are connected to leading the logical research. Research methods can be recognized as quantitative techniques or qualitative techniques, and mixed methods. This research utilized a quantitative research approach guided by positivistic research worldview. As indicated by Collis and Hussey (2009:3), the research design of any study can be ordered through methods for its motivations, processes, rationale and results. This research is descriptive in nature and used the quantitative method, and open and closed-ended questions as means to collect data.

3.6 Population and sample size

3.6.1 Population (sample)

Polit and Hungler (1999:37) imply that the population is an aggregate or complete number of all the participants, subjects or people that conform to the requirements for any study. In this investigation, the participants were drawn from clinical staff members and patients. Part of the selection criteria was that the participants needed to have similar age, social status, as well as residing in the same residential areas, and utilised the selected public healthcare facility chosen in this study. A total of 145 questionnaires were distributed to the participants

from which 113 questionnaires were returned successfully to the researcher while the remaining 32 were not returned to the researcher. The return rate of 78% of the overall questionnaires distributed proves the collection of data was a success. The respondents for this study were categorised as follows; 26 Clinical staff members who included medical personnel such as administrations clerks, general managers and nurses who work in the selected public healthcare facility. These respondents were operating in the healthcare sector and had been employed for no less than 1 year at the facility. In addition another group of respondents included 87 patients who used the health care facility to receive any medical treatment offered by the clinic. Most of these patient respondents were over and above the minimum age of 18 years. Respondents were all residents of Cassel, Letlhakajaneng, Madula Ranch, Kampeng and Maseohatshe respectively.

3.6.2 Sampling criteria

The sampling criteria used in this study was judgemental sampling also known as purposive sampling, is a non-probability sampling technique. The reason for adopting this criterion is premised on the basis that members of the selected sample possess appropriate knowledge and understanding of the subject. The research sample comprised of both clinical staff members at a selected public healthcare facility, and a bigger potion was healthcare users (patients). In addition, one of the reasons for adopting judgmental sampling was also based on the sample size chosen for the study. The clinical staff members who were employed at a selected public clinic was the small population size and a bigger portion of the sample was patients; if some of the questions of this category were omitted, it could have led to a potential loss in valuable views or perceptions applicable to this study.

Furthermore, the selected clinic provides healthcare services to a large population size and the participants sampled were patients who use that healthcare facility on regular basis. According to Babbie (2013:199), this technique is relevant when conducting social research where samples are actually selected in particular ways not recommended by probability theory. Participation was set as follows; a total of 145 questionnaires were distributed to participants. The questionnaires were distributed as follows; 110 questionnaires were distributed to healthcare users while 35 questionnaires were distributed to clinical staff members respectively. The response rate for the 110 questionnaires distributed to patients was 79 % (87) this was because the remaining 23 questionnaires were not returned. Meanwhile the response rate for clinical staff members was 74% (26) this was also because the remaining 9 questionnaires were also not returned.

3.7 Data collection instruments

3.7.1 Survey instrument – questionnaire

This study used questionnaires to collect data on the utilisation of electronic filing system to optimise patient management in a selected public healthcare facility. A questionnaire is an instrument that combines both quantitative and qualitative items. According to *Business Dictionary* (2019), a questionnaire is a tool intended to extricate particular data from respondents and documents data about a specific issue of interest. For this research, a questionnaire was the preferred data collection technique because it was reasonably quick to collect data from participants. According to *Business Dictionary* (2019), a questionnaire aids with four essential desires, namely to: (a) Accumulate fitting data; (b) Make the data essentially indistinguishable, as well as reasonable for examination; (c) Confine tendencies and requests. Some of the study's objectives were to assess if paper filing supports or diminishes the effectiveness of service delivery and to determine the status of patient management records that obstructs the provision of public healthcare services at the selected public healthcare facility.

The questionnaires that were used contained both open and closed-ended questions. As described by Farrell (2016), open-ended requests are questions that empower someone by providing a free-form answer. Close-ended requests can be answered with a simple "yes"/ "no", or they may offer a constrained plan of possible answers, for example, a- b- c- or all of the above). For this study, the questionnaire used a Likert scale which ranged from 1 to 5,with 1 being 'never', 2 'rarely', 3 'sometimes', 4 'almost always', and 5 'always'. The questionnaire was constructed with closed-ended questions, as it was believed that some guidance was required for the subjects. It contained one open ended question to allow some subjective input from the subjects.

The questionnaire that the current researcher used comprised both open-ended and closed ended questions. This is because the open-ended questions aided by further helping the researcher to gather data related to the facility as narrated and described by respondents. Close-ended questions helped to confirm the respondents understanding of the outcomes of the study which entails information on statistical details on the number people who support or did not support certain statements or issues. Furthermore, open and closed-ended questions were utilized as essential apparatuses to gather information from those who either worked at the clinic or who visited it for social insurance administration. The researcher used questionnaires because these are practical and can gather large amounts of data in a

reasonable timeframe, which can be done by a specialist with constrained impact on its legitimacy and unwavering quality.

The questionnaire comprised of two sections described as follows: For patient's questionnaire; section A focused on collecting respondents' biological information and the number of times they visit the selected public healthcare facility. Section B focused on collecting existing knowledge about current systems in place, and information on strategies to improve and update current processes. On the other hand the questionnaire for clinical staff members section A focused on collecting respondents' biological information, qualifications and length of service in the organization. Section B focused on collecting existing knowledge about current systems in place, and information on strategies to improve and update current processes.

The primary quantitative questionnaires were administered to the sample population. A self-administered hard copy was utilized, as all the respondents did not have access to computers, or were computer illiterate, hence electronic questionnaires were not viable for this study. As a result, data analysis was extensively time consuming and costly. However, the process was the most cost-effective means to collect the required information. Important moral contemplations were considered for these examinations, namely: Respondents were educated about reasons for the exploration; respondents were assured that their data would be used only for research purposes, and that their responses would remain anonymous; and all respondents were ensured that their data would be treated with the utmost confidence and anonymity.

3.7.2 Data collection/fieldwork

Structured questionnaires were utilized for this research study's data collection. The researcher obtained authority from the Northern Cape Province's Health Department's office to distribute questionnaires, and to collect the desired data at the selected public health care facility. A schedule was set up for the distribution and collection of questionnaires for the employees. The questionnaires were manually distributed to the respondents, and each question was explained in a language that they best understood. A session was reserved for respondents to ask questions and seek clarity in case they did not understand one or another point/s in the questionnaire. This was done during their lunch time so that it did not interfere with their work, and the data was collected the same day.

Other questionnaires were distributed to healthcare users who were in the waiting area at the healthcare facility. All patients visiting the healthcare facility were informed about the

study and the importance of participating in it. Patients were given a chance to decide whether they were willing to take part or not. No one was forced to partake in the study, and all the participants signed a consent form. The researcher arranged for persons who were able to speak different languages to be on stand-by to assist in case any language barriers occurred.

The session for respondents to ask questions was set in advance to allow those who did not understand the questions, to seek clarity; this was done simultaneously so that the session did not interfere with patient flow in the facility, and enabled the researcher to collect the data on the same day. This helped to avoid problems such as participants saying that they did not understand certain questions, and if anyone was unclear about the questions themselves, immediate help was rendered. All collected data was stored in a safe place for confidentiality purposes, and to be utilized for data analysis. Consequently, this method enabled the researcher to collect an extensive amount of information in a short space of time, and at a low cost.

3.7.2 Data Validity and Reliability

Data validity and reliability are the two most significant and major highlights when assessing any data collection instrument or device for decent research. Legitimacy (validity) is the degree to which discoveries of research speak to the topic that is being investigated, Koonin (2014: 257) states that "validity is about deciding whether the research measured what it was supposed to measure". The term dependability and/or reliability portrays whether a similar outcome can be created if a similar study were to be conducted again by an alternate analyst at an alternate time, using a similar strategy or instrument; thus, data reliability is concerned with the investigation's dependability (Koonin, 2014: 257). Hence, the current researcher utilized the questionnaire instrument to obtain dependable and substantial outcomes. To overcome factors, which may influence unwavering quality on the managed questionnaires, straightforward language was utilized to maintain a strategic distance from vagueness, since equivocalness in the wording of expressions or questions, can influence the instrument's dependability. Questionnaires are logical estimation instruments, which should yield scores of sufficient data quality and legitimacy (Dörnyei & Taguchi, 2009: 93). The researcher additionally considered the questionnaire's legitimacy and respondents were assured of guaranteed secrecy and obscurity to build legitimacy of the responses. Reliability is adopted in this study by ensuring that no question is answered twice by the same respondent and all respondents have answered all the questions in the questionnaire.

To measure reliability the following reliability test formula was used: Cronbach's Alpha

k = no. of items

= (k/k-1) *(1- (sum of items variance /var of total scores))

Reliability statistics for Patients Questionnaire

Table 3 2: *Reliability Statistics for Patients*

K	41
Sum of items variance	3.61
Var of Total Score	162.74
Cronbach's Alpha	1.00

Reliability statistics for clinical staff members' questionnaire

Table 3 3: *Reliability Statistics for Clinical staff members*

K	49
Sum of items variance	13.42
Var of Total Score	278.59
Cronbach's Alpha	0.97

The above tables display the results obtained. Based on table 3.2, the reliability measurement for this study was Cronbach alpha 1.00, which is very high and indicates strong internal consistency among the given items and it means the instrument was very reliable. In addition, based on table 3.3, the reliability measurement for this study was Cronbach alpha 0.97, since all the responses were framed positively; it means all clinical staff participants answered in the same direction. Based on the above interpretation, it can be concluded that the instrument in this research fulfil the reliability.

3.8 Data analysis procedures

3.8.1 Quantitative data analysis procedure

As previously stated, the questionnaire used for this study was constructed with closed-ended questions, as it was believed that some guidance was required for the subjects. It contained one open ended question to allow some subjective input from the subjects. This type of research study was used to gauge the issue through techniques that can be transformed into usable bits of knowledge to deliver numerical or other types of data. It is utilized to analyse viewpoints, choices, as well another defined variable. Quantitative analysis utilize quantitative measurements to design compounds to discover research outlines (DeFranzo, 2011).

Moreover, the data was modified, and codes were assigned to answers on the questionnaires, which systematically captured the responses onto an Excel Microsoft spreadsheet, taking into account the limited number of categories and exclusive characteristics. Hence, the study's quantitative data was captured onto an Excel Microsoft spreadsheet, further it was analysed and tested for reliability using Cronbach's Alpha as already explained in section 3.7.2 above. The researcher conducted statistical analysis and interpreted the findings. The study used various types of tools for data presentation such as bar graphs, tables and frequency tables to present the respondents' answers and to facilitate discussion of the findings.

3.8.2 Qualitative data analysis procedure

Qualitative data analysis procedure was used to analyse open-ended question, which provided the qualitative data. The same worksheet that was used to analyse the quantitative data was also to analyse qualitative data, which was then captured in a separate table. The respondent's response was captured systematically in each column. The data reduction method was utilized by classifying data into a limited number of categories. As previously stated, the open-ended question aided by further helping the researcher to gather data related to the facility as narrated and described by respondents.

3.9 Ethical consideration

According to the 'Ethical Guidelines and Principles of Conduct for Anthropologists', published in *Anthropology Southern Africa*(2005:142-143), it is essential to inform respondents of the purpose of the research, and, where conceivable and doable, to incorporate their concerns within the research design and accommodate them in respect of the research methods. Researchers should be mindful of the rights of participants in the research study.

Ethics centres around theory, religion, philosophy, or sociology (Resnik, 2015). According to Resnik (2015), there have been numerous explanations for the importance of adherence to moral standards. First, standards advance the point of investigation, similar to information, truth, and evasion of blunder. For example, provisions against the manufacture, falsification or misrepresentation of research data encourage truth and mitigate error. For this study, the researcher informed respondents of the aims of the study and assured them that any information divulged by them would be treated with the utmost confidentiality. Furthermore, all sources of information and data used in the thesis were duly acknowledged throughout. For instance, a few good standards in analysis, similar to tips for origin, copyright and

protecting approaches, data sharing strategies, and classification rules audit, were intended to shield holding interest through reassuring cooperation. Most scientists desire acknowledgement of their work; however, they do not want their concepts disclosed/published in an untimely manner (Resnik, 2015).

To conduct this study, ethical clearance was obtained from both the Northern Cape Department of Health and the Research Ethics Committee of the Faculty of Business and Management Sciences at the Cape Peninsula University of Technology (CPUT) (see Appendix A: Ethical Clearance). Research participants were not coerced to participate in the study, and all participants signed a letter of consent (see Appendix B: Letter of Consent) in respect of their participation in this study. Personal information of participants such as their identities were neither requested nor mentioned, and anonymity was maintained consistently. Researchers and reviewers have an ethical responsibility to recognise and protect the rights of respondents in human research (Burns & Grove, 2005:181). The researcher considered ethical issues to ensure professionalism and the overall quality of the research report. Respondents were assured that all data that they provided would be handled with the highest level of confidentiality.

3.10 Chapter Summary

This chapter discussed the research study's research methodology and methods to obtain data. This chapter provided research paradigm of the study and also included a brief summary of the research questions, aims and objectives guiding the current study. This was done as a way to guide the reader(s) to understand the problem that was investigated by the study. The chapter further discussed research approach for data acquisition and populations, as well as the study's primary research phase in which the study took place, as shown in figure 3.1 above showing the research flow process underpinning this study. The chapter also identified and discussed sampling methods, instruments and ethical considerations for the research study. The following chapter reports on the study's results.

CHAPTER 4: DATA ANALYSIS, PRESENTATION AND DISCUSSION OF RESULTS

4.1 Introduction

The previous chapter, chapter three provided the research paradigm of the study as well as the research process underpinning this study. The research methodology and sampling technique as well as data collection instruments utilised in this study were also provided. This study sought to assess if paper filing supports or diminishes the effectiveness of service delivery at a community healthcare facility in the Northern Cape Province. This chapter, chapter four contains detailed presentation and discussion of data analysis and the results of this study, emanating from data that was collected from sampled clinical staff members at a selected public healthcare facility, and healthcare users. Chapter four firsts presents the Hypothesis findings of the study. The researcher presents this chapter in two sections, namely section A and section B. Section A focuses on data presentation and analysis while section B focus on discussion of the data. These discoveries depended on results, as well as the abstract framework illustrated in chapter two under literature review. In presenting the analytical discussion of the findings, references are made to literature that was reviewed, as illustrated in Chapter 2, and to previous analysis in support of or in logical inconsistency with these discoveries. Hence, in this regard, it is imperative to revisit the study's objectives, as shown below:

Table 4. 1: *Summary of Research questions and objectives*

Research Questions	Research Objectives	Data Collection Method
How do patient records obstruct the provision of public healthcare service at a selected public healthcare facility?	**Determine** the status of patient management records that obstructs the provision of public healthcare services at the selected public healthcare facility	Questionnaire
What are the main reasons for misplaced patient folders at a selected community healthcare facility?	**Identify** the main reasons for misplaced folders that hinder delivery of services in the selected community healthcare facility	Questionnaire
How would paper filing support or diminish the effectiveness of service delivery at a selected public healthcare facility?	**Assess** if paper filing supports or diminishes the effectiveness of service delivery at a selected public healthcare facility	Questionnaire
How does clinical staff perceive information management technology?	**Understand** the awareness of personnel with regard to information management technology	Questionnaire
What are the benefits and challenges of both paper-based and electronic filing systems?	**Identify** the benefits and challenges of the paper-based filing system, and electronic filing at the selected public healthcare facility;	Questionnaire

How can moving from a paper-based filing system to an electronic filing system improve healthcare work, as well as benefit patients' lives at the healthcare facility?	**Explore** the effects of technology on information management on health workers and patients at the public healthcare facility; and	Questionnaire
What are the required measures to improve daily processes to ensure best management of information, whilst improving efficiency at the public healthcare facility?	**Investigate** what modifications can be done to improve current daily processes at the selected public healthcare facility.	Questionnaire

4.2 Data Presentation and Discussion

The data for the current study is presented in the form of descriptive statistics using percentages, bar graphs, pie diagrams and frequency counts. For inferential statistics, the researcher uses the null hypothesis **H₀** and the alternative hypothesis **Hₐ**. The null hypothesis (**H₀**) is that there is no difference while the alternative hypothesis (**Hₐ**) is the claim for which we seek evidence and this evidence is measured using a p-value. The p-value is the probability of obtaining a sample statistics as extreme as (or more extreme than) the observed sample statistic, when the null hypothesis is true. In order to make a decision, p-value is measured using a pre-specified significant level, "a" which is = 0.05 for this study. The formula adopted for this study is as follows:

$H_0: \mu_p = \mu_s$

$H_A: \mu_p \neq \mu_s$

If p-value < a, **H₀** is rejected, and there is a statistically significant evidence for **Hₐ**.

If p-value is > a, **H₀** is not rejected, the test is inconclusive, and the results are not statistically significant. The analysis was performed with the statistical program Jamovi. Jamovi is Open Source program and can be downloaded on the web for free.

4.2.1 Testing hypotheses

4.2.1.1 Hypothesis 1

To test the first null hypothesis which stated that there is independence between patients (health users) and clinical staff members regarding benefits of computerizing patient records at a selected public healthcare facility. Based on Table 4.3, the null hypothesis is accepted at the 5% level of significance as the p-value 0.551 is larger than 0.05.

Table 4. 2: *Contingency table of health users and clinical staff member's perception regarding computerizing patient records*

| Respondent | | Benefit | | | | | Total |
		Less Retrieval Time	Less Filing Space	Save Stationary	Less Paper	Short Queues	
Patient	Observed	65	48	37	38	53	241
	Expected	60.3	46.9	39.1	39.9	54.8	241
Staff	Observed	12	12	13	13	17	67
	Expected	16.8	13.1	10.9	11.1	15.2	67
Total	Observed	77	60	50	51	70	308
	Expected	77	60	50	51	70	308

Table 4. 3: *Chi-Square result of health users and clinical staff member's perceptions regarding computerizing patient records*

Parameter	Value	Df	P
χ^2	3.04	4	0.551
N	308		

The first null hypothesis of the study, hypothesis 1(H0), was stated as there is independence between patients (health users) and clinical staff members regarding benefits of computerizing patient records at a selected public healthcare facility.

The corresponding alternative hypothesis1 (HA), was that there is dependence between patients (health users) and clinical staff members regarding benefits of computerizing patient records at a selected public healthcare facility.

Based on Table 4.3, the null hypothesis is accepted at the 5% level of significance as the p-value 0.551 is larger than 0.05, the results indicate that there was no significant difference between patients (health users) and clinical staff members on the envisaged benefits of computerizing patient records at a selected public healthcare facility. Patients and health workers are therefore in agreement about the benefits of computerizing patients records.

4.2.1.2 Hypothesis 2

In testing the second null hypothesis, which stated that there is no statistically significant difference between the time that patients' wait before receiving medical folders compared with file retrieval time, the Bayesian t-test was used for the analysis. Hypothesis 2 comprises of three different tests in order to reach meaning conclusion, firstly the researcher tested patients waiting time compared with file retrieving time, secondly to check if the waiting hours as indicated by patients are different from the waiting hours indicated by staff and third if there is a difference between the times that a file is retrieved and the waiting time as indicated by the staff.

The following tables indicates test 1 (*patients waiting time compared with file retrieving time*)

$H_0: \mu_p = \mu_s$

$H_A: \mu_p \neq \mu_s$

Based on Table 4.4 there is no significant difference between retrieving time and waiting time as indicated by the p-value (0.576).

Table 4. 4: *Independent Samples T-Test: Patients waiting time compared with file retrieving time*

Independent Samples T-Test: Patients waiting time compared with file retrieving time

		Statistic	df	p
Retrieve/Wait Hr	Student's t	0.561	110	0.576
	Bayes factor$_{10}$	0.27		

Homogeneity of Variances Test (Levene's)

	F	Df	df2	p
Retrieve/Wait Hr	14.8	1	110	< .001

Group Descriptive Statistics

	Group	N	Mean	Median	SD	SE
Retrieve/Wait Hr	Patient	87	1.21	1.5	0.812	0.0871
	Staff	25	1.1	0.15	1.11	0.223
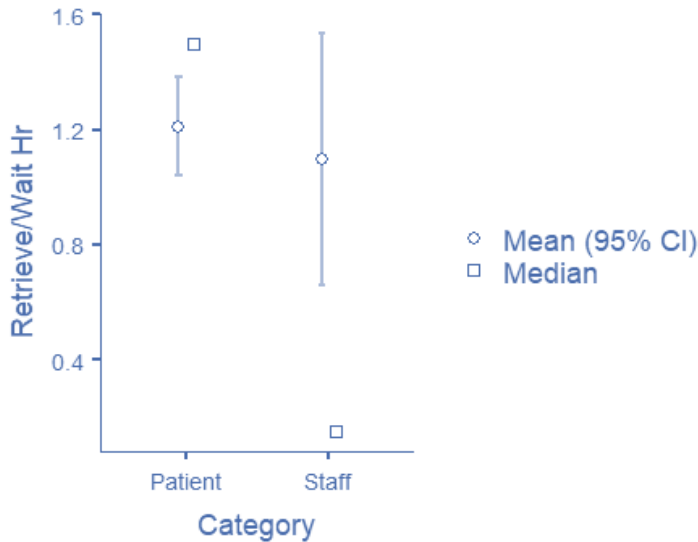
Figure 4 1: *Retrieving time compared with waiting time as indicated by patients*

From the above Table 4.4 Independent Samples T-Test: Patients waiting time compared with file retrieving time, the researcher concludes that:

There is no significant difference between retrieving time and waiting time as indicated by the p-value (0.576) (table 4.4).

Because of the huge difference between sample sizes the Bayesian factor is also indicated, namely 0.27.This means that the likelihood of the null-hypothesis occurring is 3.7 (1/0.27) times more likely to occur. Therefore, in both cases we accept the null-hypothesis at the 5% level of significance. The above graph (figure 4.1) also confirms the result as the patients' interval falls completely in the staff retrieval time interval.

The following tables indicate test 2 (*if the waiting hours as indicated by patients are different from the waiting hours indicated by staff*). Based on Table 4.5, the null hypothesis is rejected at the 5% level of significance, as the p-value of 0.008 is smaller as 0.05

Table 4. 5: *Independent Samples T-Test: Patients waiting time compared with staff waiting time*

Independent Samples T-Test: Patients waiting time compared with staff waiting time

		Statistic	df	p
Wait/Wait Hr	Student's t	2.7	105	0.008
	Bayes factor$_{10}$	5.43		

Homogeneity of Variances Test (Levene's)

	F	df	df2	p
Wait/Wait Hr	0.0312	1	105	0.86
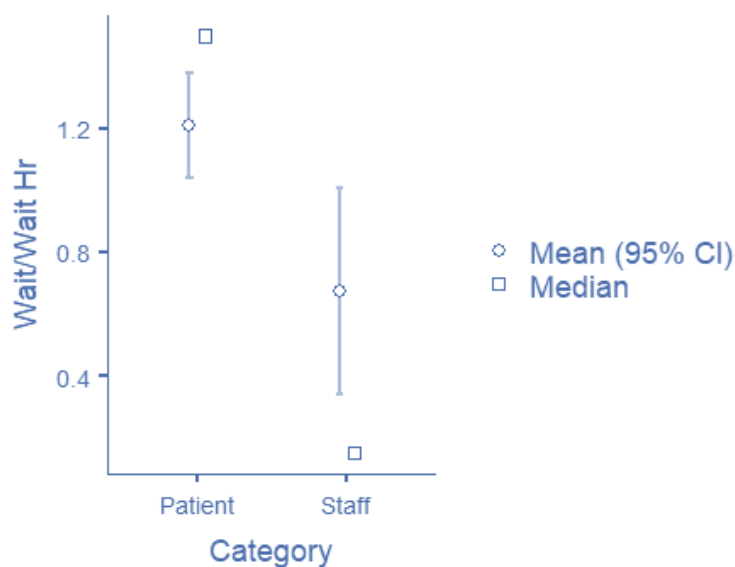
Figure 4 2: *Patients waiting time compared with staff waiting time*

Second test: if the waiting hours as indicated by patients are different from the waiting hours indicated by staff. The adopted formula was as follows:

H$_0$: μ$_p$=μ$_s$

H$_A$: μ$_p$≠μ$_s$

In the second test there is different conclusion to the first test: The null-hypothesis is rejected at the 5% level of significance, as the p-value of 0.008 is smaller as 0.05. The Bayes factor also indicates that the alternative hypothesis will occur 5.43 times more likely than the null-hypothesis. From the graph (figure 4.2), we notice that the two intervals are mutually exclusive. Another sign that there is a difference.

The following table indicates test 3 (*if there is a difference between the times that a file is retrieved and the waiting time as indicated by the staff*).

Based on table 4.6 below, at the 5% level of significance the null-hypothesis is rejected in favour of the alternative hypothesis (p=0.045<0.05).

Table 4. 6: *Paired Samples T-Test: Clinical staff Retrieving time compared with staff waiting time*

Paired Samples T-Test: Clinical staff Retrieving time compared with staff waiting time

		Statistic	df	p
Retrieve/Waiting Hr Staff	Student's t	2.19	18	0.042
	Bayes factor$_{10}$	1.63		

Group Descriptive Statistics

	Group	N	Mean	Median	SD	SE
Retrieve/Wait Hr	Retrieve Hr	19	0.839	0.15	1.065	0.244
	Wait Hr	19	0.629	0.15	0.756	0.173
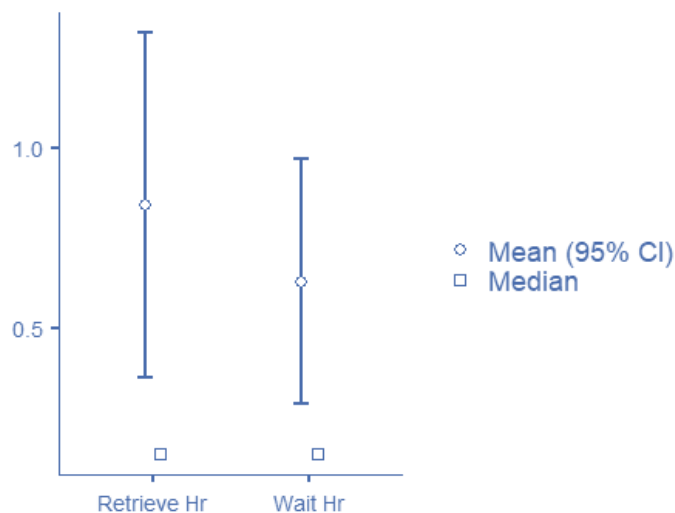
Figure 4 3: *Clinical staff Retrieving time compared with staff waiting time*

Third Test: if there is a difference between the times that a file is retrieved and the waiting time as indicated by the staff. The adopted formula was as follows:

H$_0$: μ$_p$=μ$_s$

H$_A$: μ$_p$≠μ$_s$

At the 5% level of significance the null-hypothesis is rejected in favour of the alternative hypothesis (p=0.045<0.05) (table 4.6). However, the Bayes factor

indicates that the likelihood of the occurrence is only 1.63 in favour of the alternative Hypothesis.

In order to support the main research questions, the collected data from the questionnaires was categorised into the following four subsections, each corresponding to the initial research questions. Section 1 comprised participants' demographic details, Section 2 dealt with the facility's state of record management, Section 3 covered challenges and benefits, and Section 4 comprised of considerations. Figure 4.4 below illustrates the flow process of the questionnaire's administration and analysis.
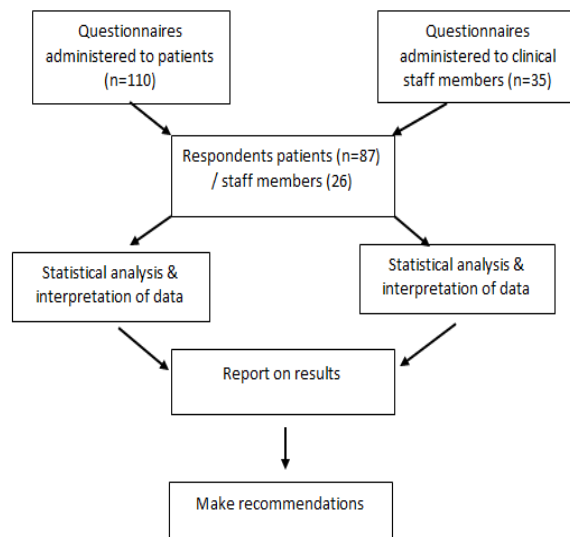
Figure 4 4: *Result flow process*

Source: Author's own diagram

4.3. Presentation of Findings and Analysis (Biographical variables)

The questionnaire was developed in line with the objective of the study and was distributed at a selected public healthcare facility in the Northern Cape Province. As per the sample, the researcher distributed 110 questionnaires to patients and a total of 87 (79%) (Figure 4.4) were returned to the researcher. This indicates that only 23 (21%) of the patients' questionnaires were not returned to the researcher. Furthermore, 35 questionnaires were distributed to staff members who work in that selected public facility and the researcher received 26 (74%). Only 9 (26%) of questionnaires distributed to staff members were not returned to the researcher. This

indicates that the researcher distributed 145 (100%) questionnaires and received a final number of 113 (93%) completed questionnaires.

4.3.1 Profile of participants

Twenty-six healthcare workers (clinical staff members), namely 23%, and eighty-seven users of healthcare services (patients), namely 77%, at a selected public healthcare, participated in this study.
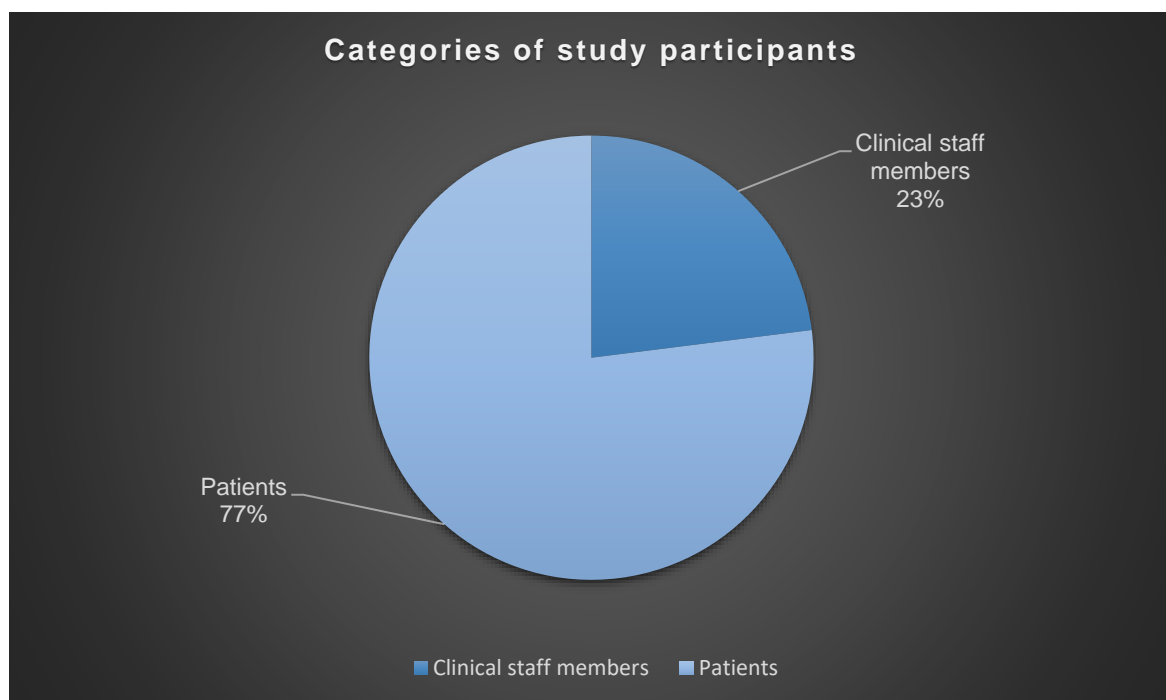
Figure 4 5: *Categories of participants*

4.3.2 Demographics

Table 4. 7: *Respondents' demographics*

Demographic	Clinical staff members	Patients
Gender		
Female	71%	62%
Male	29%	38%
Sum	100%	100%
% of No Response	0%	0%
Total	**100%**	**100%**
Age		

18-24	4%	56%
25-34	35%	28%
35-49	38%	10%
50-64	12%	6%
> 65	0%	0%
Sum	89%	100%
% of No Response	11%	0%
Total	**100%**	**100%**
Qualifications		
Doctorate	0%	n/a
Master's degree	0%	n/a
Honour's degree/BTech Degree	0%	n/a
Diploma	0%	n/a
Matric	4%	n/a
Other	31%	n/a
Sum	54%	n/a
% of No Response	89%	n/a
Total	11%	n/a
	100%	**n/a**
Type of position		
Manager	4%	n/a
Deputy manager	4%	n/a
Senior administrative officer	4%	n/a
Administrative officer	4%	n/a
Administrative clerk	8%	n/a
Other	77%	n/a
Sum	97%	n/a
% of No Response	3%	n/a
Total	**100%**	**n/a**
Experience at the selected public healthcare		
Less a year	4%	n/a
2 - 3 years	46%	n/a
3 - 4 years	4%	n/a
4 -5 years	4%	n/a
More than 5 years	42%	n/a
Sum	100%	n/a
% of No Response	0%	n/a
Total	**100%**	**n/a**

4.3.2.1 Participants' gender

The following graphical illustrations draw from the above table.

Given the list of respondents, the majority of patients' participants were females 71.3%, while males were 28.7%. Furthermore, 61.5% of clinical staff is female with 38.5% male (Table 4.8).

Table 4. 8: *Contingency Table of Gender compared with respondents*

	Category	

Gender		Patient	Clinical Staff	Total
Female	Observed	62	16	78
	% within row	79.5 %	20.5 %	100.0 %
	% within column	71.3 %	61.5 %	69.0 %
	% of total	54.9 %	14.2 %	69.0 %
Male	Observed	25	10	35
	% within row	71.4 %	28.6 %	100.0 %
	% within column	28.7 %	38.5 %	31.0 %
	% of total	22.1 %	8.8 %	31.0 %
Total	Observed	87	26	113
	% within row	77.0 %	23.0 %	100.0 %
	% within column	100.0 %	100.0 %	100.0 %
	% of total	77.0 %	23.0 %	100.0 %

4.3.2.2 Participants' age distribution

Table 4.9 below indicates that a majority of respondents were between the ages of 18 – 24 (44%), followed by 25 - 34 (29%), 35 - 49 (17%), 50 – 64 (7%), while there were no participants who were older than 65, and 3% of the respondents did not indicate their age group.

Table 4. 9: *Frequency distribution table respondents' age groups*

Age range	Value	Frequency	Percentage
18-24	1	50	44%
25-34	2	33	29%
35-49	3	19	17%
50-64	4	8	7%
> 65	5	0	0%
Total		110	97%

4.3.2.3 Clinical staff members' qualifications
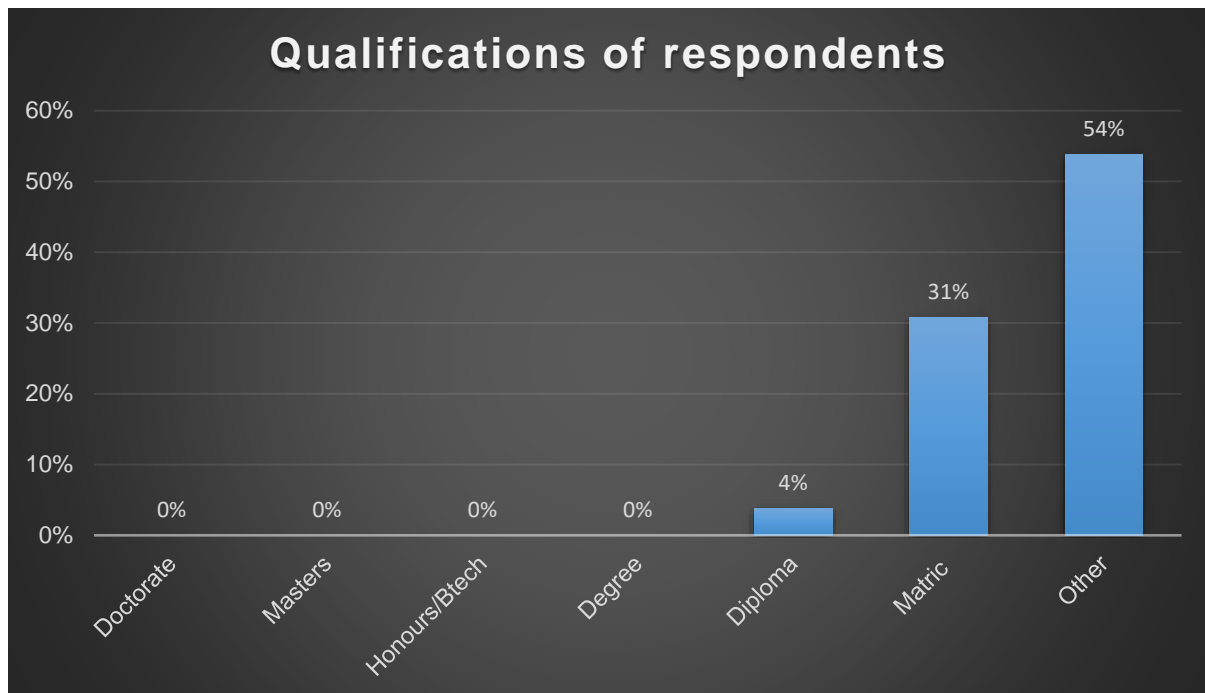
Figure 4 6: *Qualifications of respondents*

The above figure shows that none of the respondents held doctorates, Master's, Honours, or under-graduate degrees. A total of 4% of the respondents have diplomas, while 31% of them have a Matric certificate, and 54% indicated 'other' in this respect.

4.3.2.4 Clinical staff members' positions

The Figure 4.7 below display the results from respondents regarding their positions in the selected healthcare facility. The result from the study show that a total of 7.8% of the respondents are managers; 7.8% are deputy managers; 4% are senior administrative officers; 4% are administrative officers, and 8% are administrative clerks. A total of 77% indicated 'other' in this regard.
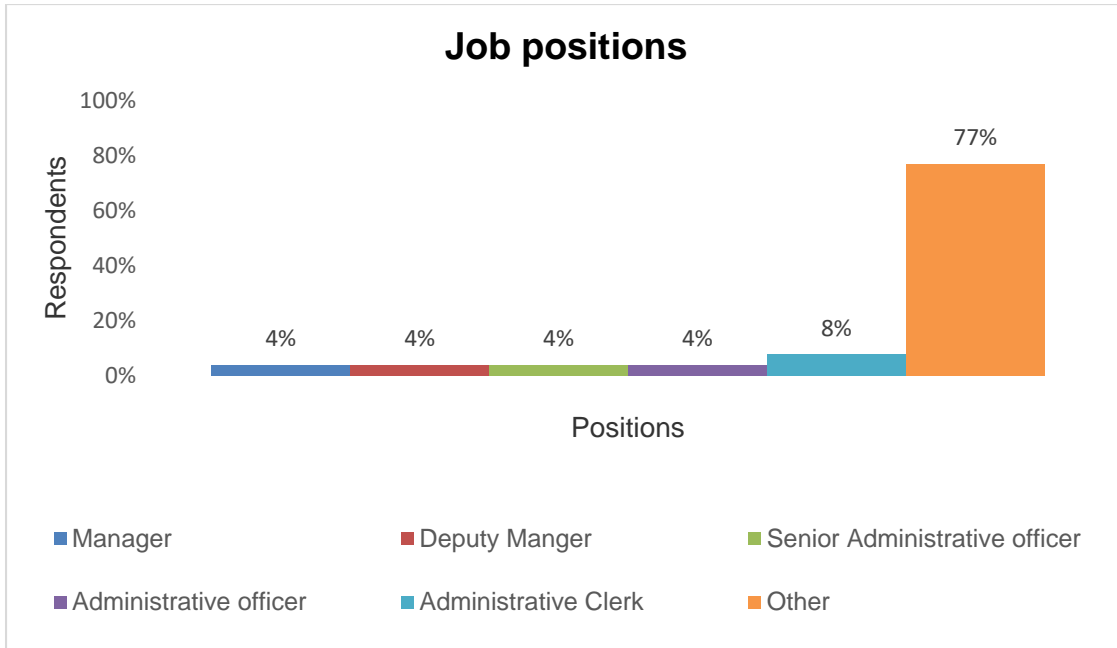
Figure 4 7:*Respondents' positions*

4.3.2.5 Respondents' years of experience
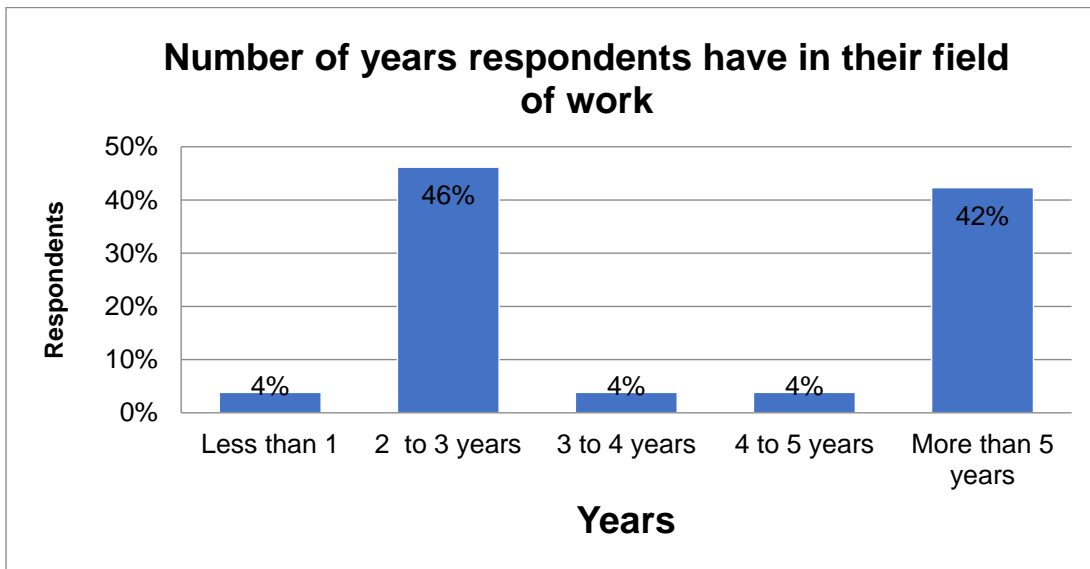
Figure 4 8: *Respondents' years of experience*

The respondents revealed their length of employment at the selected public healthcare facility, as shown in Figure 4.8. A total of 46% of the respondents have worked there for two to three years, while 42% worked there for more than five years. A total of 4% of the respondents worked there for less than a year, while another 4% worked there for three to four years, and a further 4% worked there for four to five years .

4.4 State of record management

4.4.1 Descriptive analysis of Section Two of questionnaire (patients)

(Questionnaire attached as Appendix C)

4.4.1.1 Patients' number of visits to the clinic

Table 4. 10: *Frequency distribution table patient's number of visitation to the facility*

	Value	Frequency	Percentage
	How often do you visit the clinic?		
Once a week	1	7	8%
Twice a week	2	11	13%
Once a month	3	54	62%
Once a year	4	12	14%
Other	5	3	3%
Total		87	100%

The following graphical illustrations draw from the above table (Table 4.10).

The figure 4.9 below, displays how often the respondents visited the selected public healthcare facility. A total of 62% indicated that they visited it once a month, while 14% mentioned that they visited it once a year, and 13% visited it twice of week. A further 8% of the respondents indicated that they visited the clinic once a week, while 3% indicated 'other' in this regard.
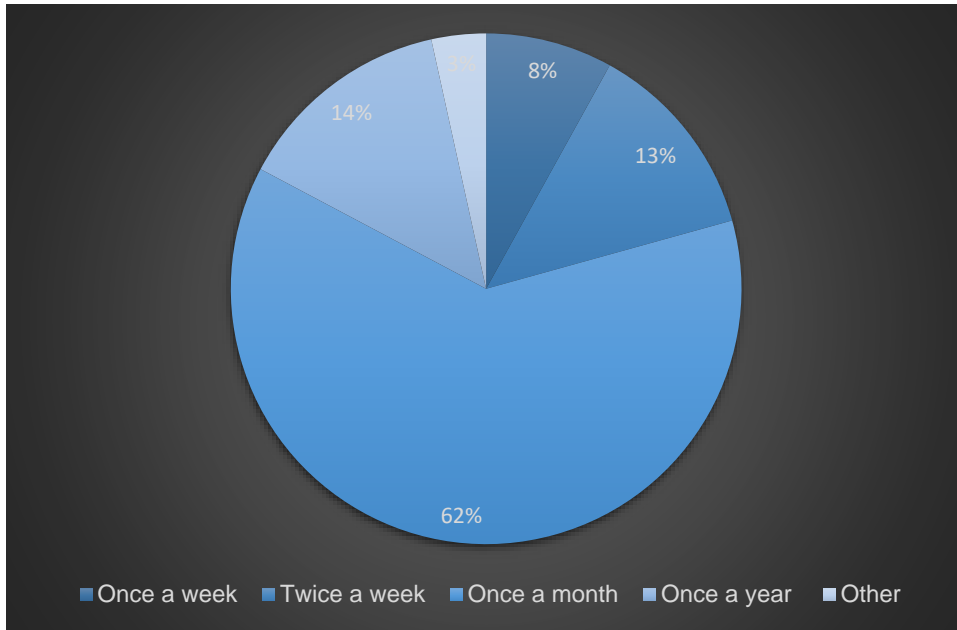
Figure 4 9: *Health users' number of visits to the clinic*

4.4.1.2 Respondents' waiting time at the selected public healthcare facility

From your previous visit, how long did you wait before receiving your folder (medical file)?

Table 4. 11: *Frequency distribution table patients waiting time before receiving folders*

	From your previous visit, how long did you wait before receiving your folder (medical file)?		
1 - 30 minutes	1	13	15%
30 – 60 minutes	2	17	20%
1- 2 hours	3	30	34%
2-3 hours	4	27	31%
Other	5	0	0%
Total		87	100%

The following graphical illustrations draw from the above table (Table 4.11).The graph below shows the time that respondents had to wait before receiving their medical files: 15% of the respondents indicated that they waited for 1-30 minutes, 20% waited for 30-60 minutes, 34% waited for 1- 2 hours, and 31% waited for 2-3 hours (figure 4.10).
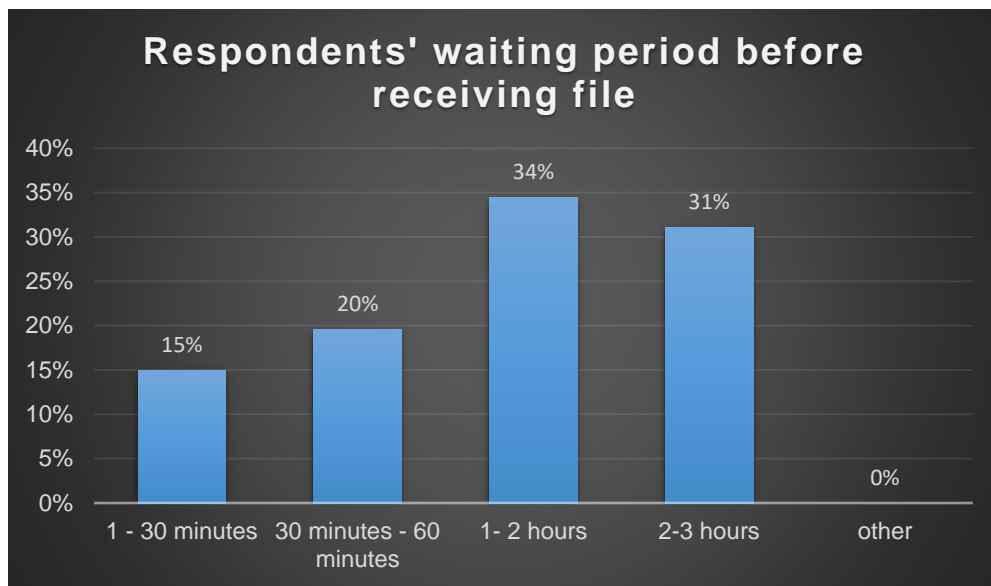
Figure 4 10: *Respondents' waiting period*

4.4.2 Descriptive analysis for Section Two of questionnaire (clinical staff members)

(Questionnaire attached as Appendix D).

4.4.2.1 State of patient records management

The study's participants were asked to rate the management of patient folders. A total of 27% of them indicated that they were unsure in this respect, 19% stated that management of patient folders was good, 12% indicated that it was very good, while 15% said it was very poor, and 27% stated that it was poor (figure 4.11).
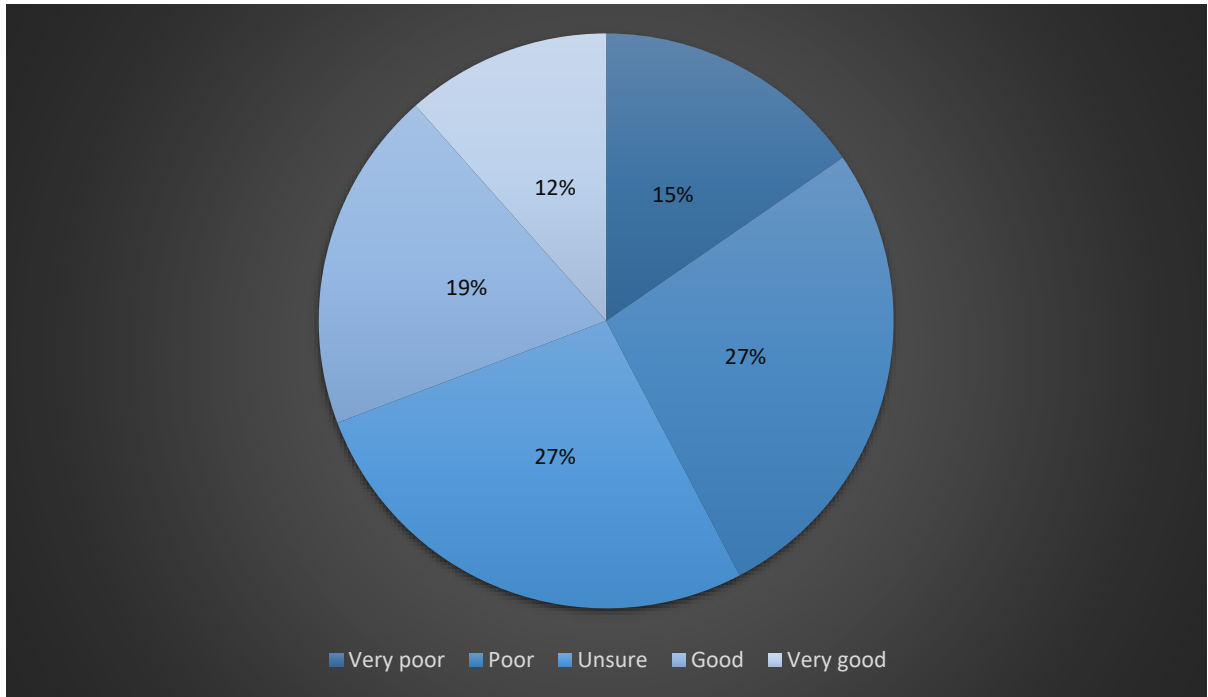
Figure 4 11: *State of patient records management*

4.4.2.2 Formal training to manage patients' files

Is there any formal training (to manage patient files) offered to staff in your institution?

In terms of the above question, relating to whether staff received any formal training to manage patient files, 50% indicated yes, and 50% said no.
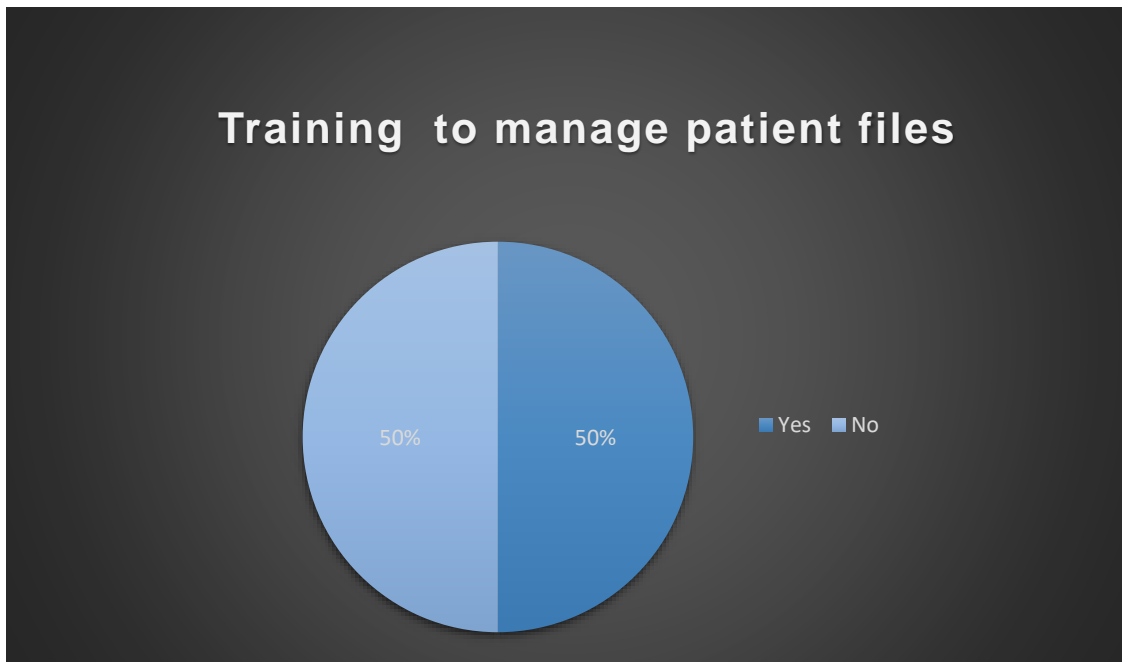
Figure 4 12: *Patient files training*

4.4.2.3 Level of training

The respondents were probed about the training's competency level, and 42% of them indicated that it was at a basic level, 4% said that it was at an intermediate level, 4% said an advanced level, and no respondents mentioned that it was at a graduate material level (Figure 4.13)
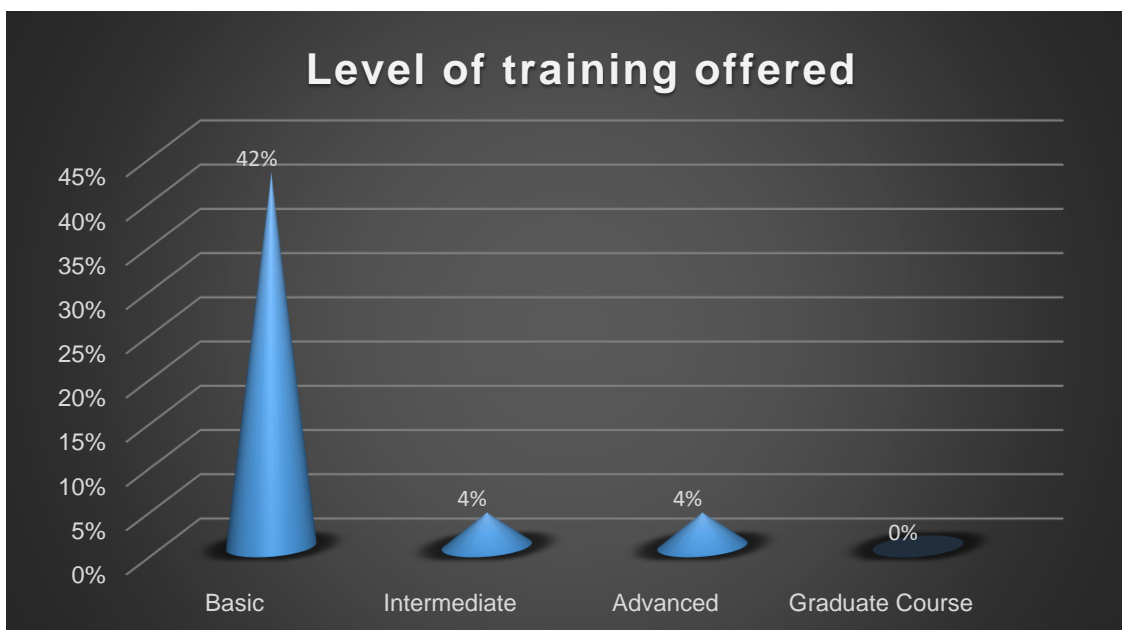
Figure 4 13: *Level of training offered*

4.4.2.4 Kind of training

A total of 4% of the respondents indicated that private trainers provided in-house training, 38% mentioned that internal staff conducted, while none (0%) of the respondents mentioned that that an external institution or other provided training, and only 8% of the respondents did not indicate the kind of training that was offered (figure 4.14) below.

Figure 4 14: *Kind of training offered*

4.4.2.5 Training offered by internal staff

Of those respondents who indicated that they received in-house training by a staff member, (Figure 4.15) below, 46% said that mangers offered the training, and 4% stated that supervisors trained them. None of the respondents mentioned that their provincial office, or other, provided them with training.
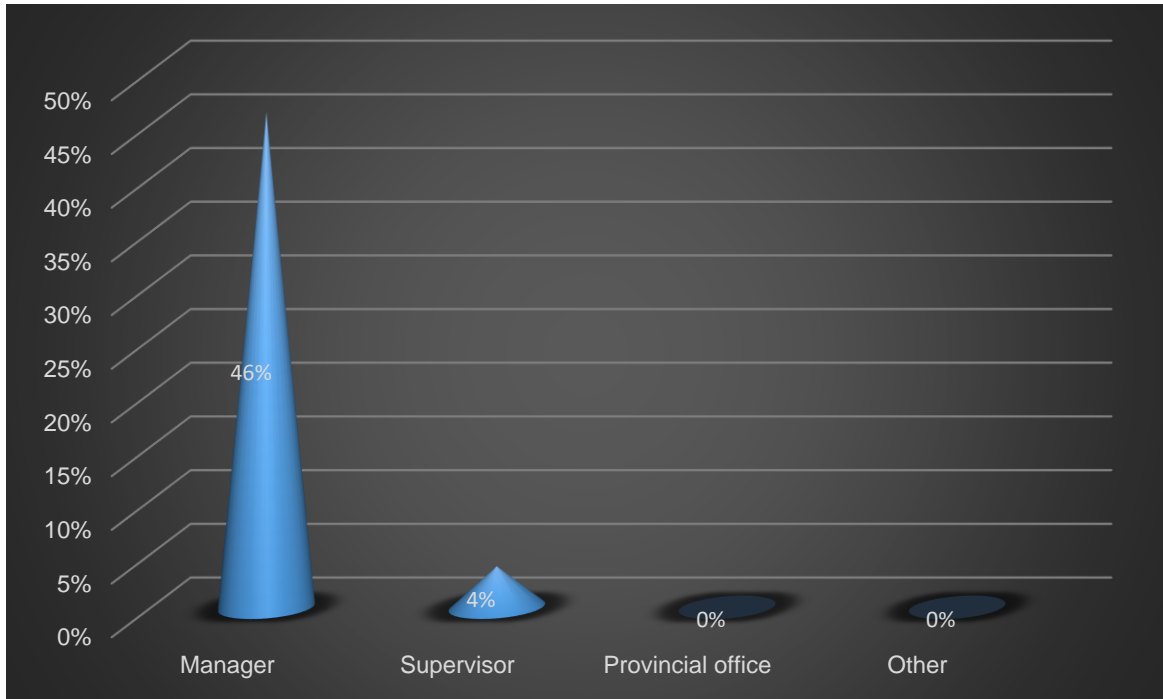
Figure 4 15: *In-house training offered*

4.4.2.6 Timeframe to retrieve patient folders

In terms of whether or not respondents have a timeframe in which to retrieve patient folders, 77% said yes, and 23% said no (figure 4.16).
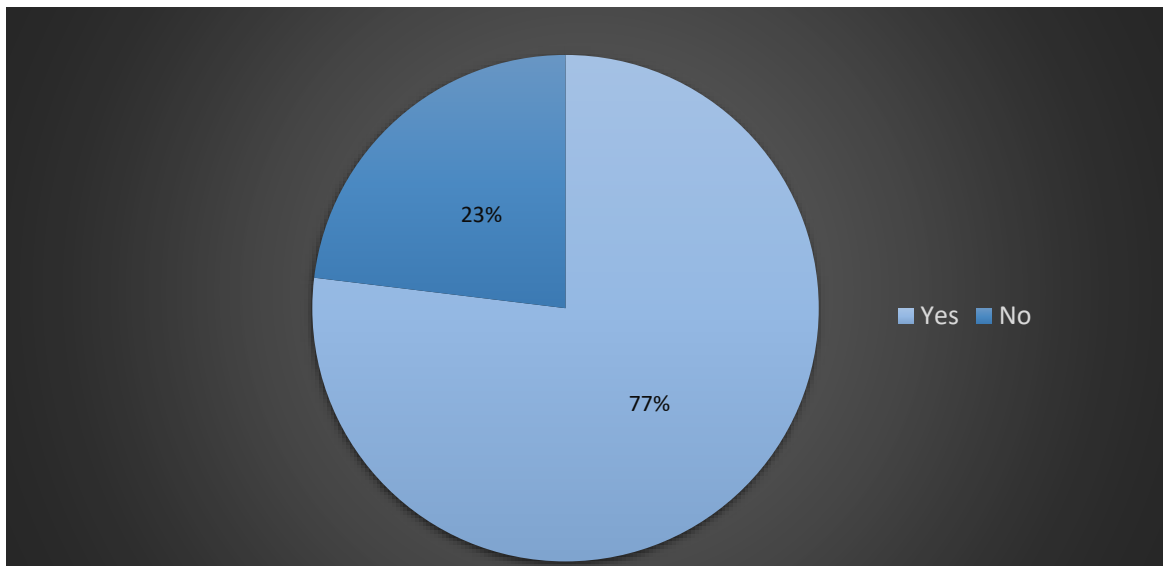
Figure 4 16: *Timeframe to retrieve patient folders*

4.4.2.7 Average timeframe to retrieve patient folders

The respondents stated that there was an average timeframe to retrieve patient folders. A total of 50% mentioned that it took 1-30 minutes to retrieve patient folders, while none said that it took them 30–60 minutes. A further 23% of the respondents said that it took 1-2 hours, 4% said that it took them 2–3 hours, and 0% indicated other in this regard (see figure 4.17).
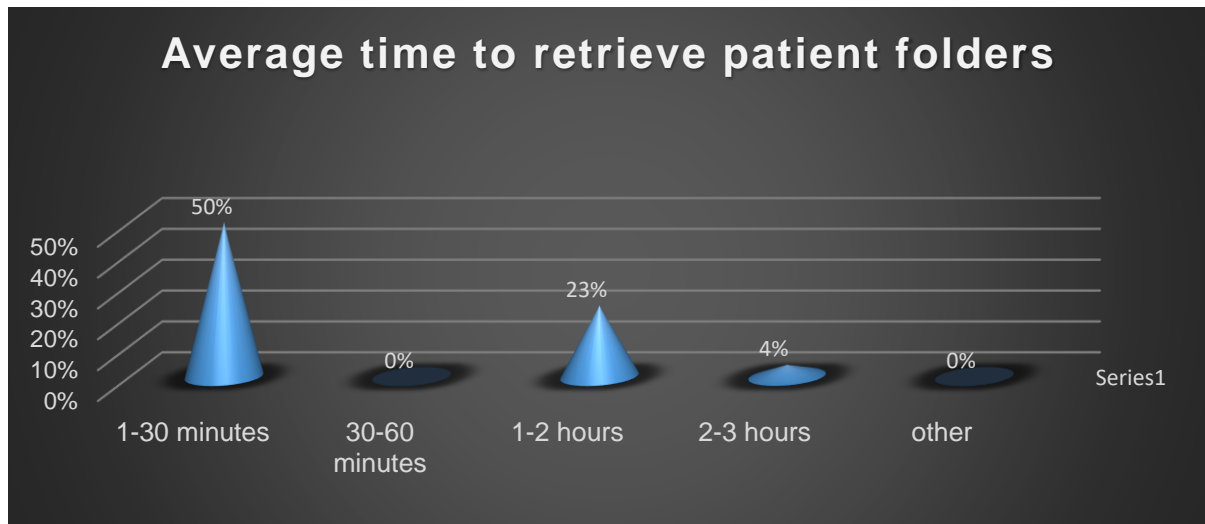
Figure 4 17: *Average timeframe to retrieve patient folders*

4.4.2.8 Time before patients receive folders

Figure 4.18 below, show that 50% of the respondents stated that they normally waited between 1-30 minutes, 8% said that they waited for 30–60 minutes, 4% said 1- 2 hours, 35% mentioned 2–3 hours and none of the respondents said other in this regard.
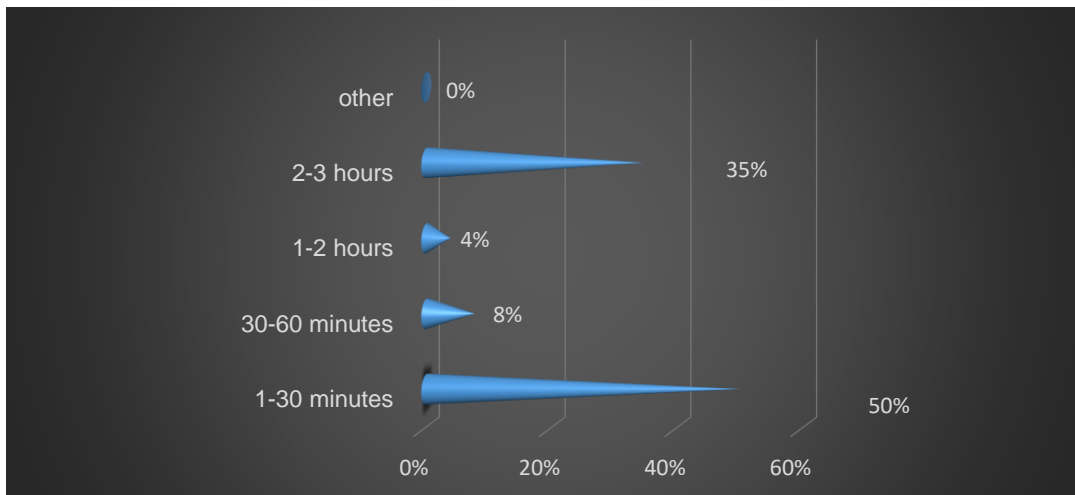
Figure 4 18: *Time before patients receive their folders (medical files)*

4.4.2.9 Problems/ causes of delays for late folder retrievals

The respondents indicated possible factors that cause patients to wait longer than the facility's set timeframe to retrieve patient folders: missing files (20%); staff shortages (30%); high patient folder demand (10%); misfiling (30%); and untidy filing (10%) (Figure 4.19).
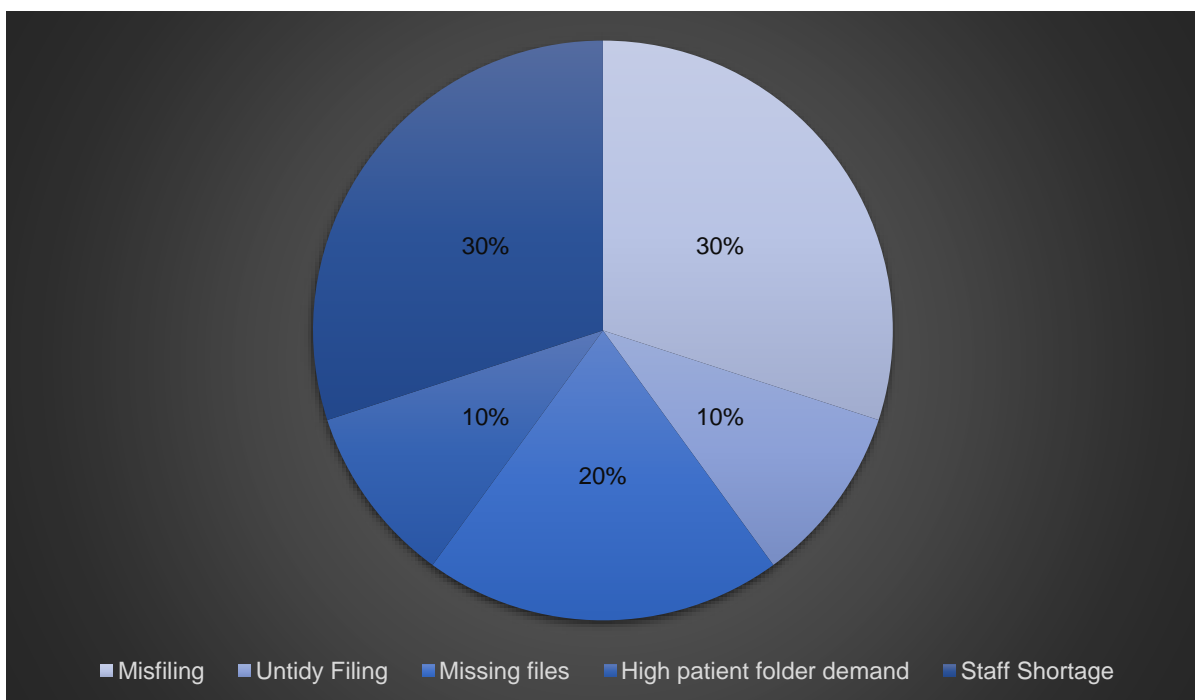
Figure 4 19: *Causes of delays for late folder*

4.4.2.10 Experience with electronic filing

When respondents were asked if they had used electronic filing systems before, all of them said that they had not.
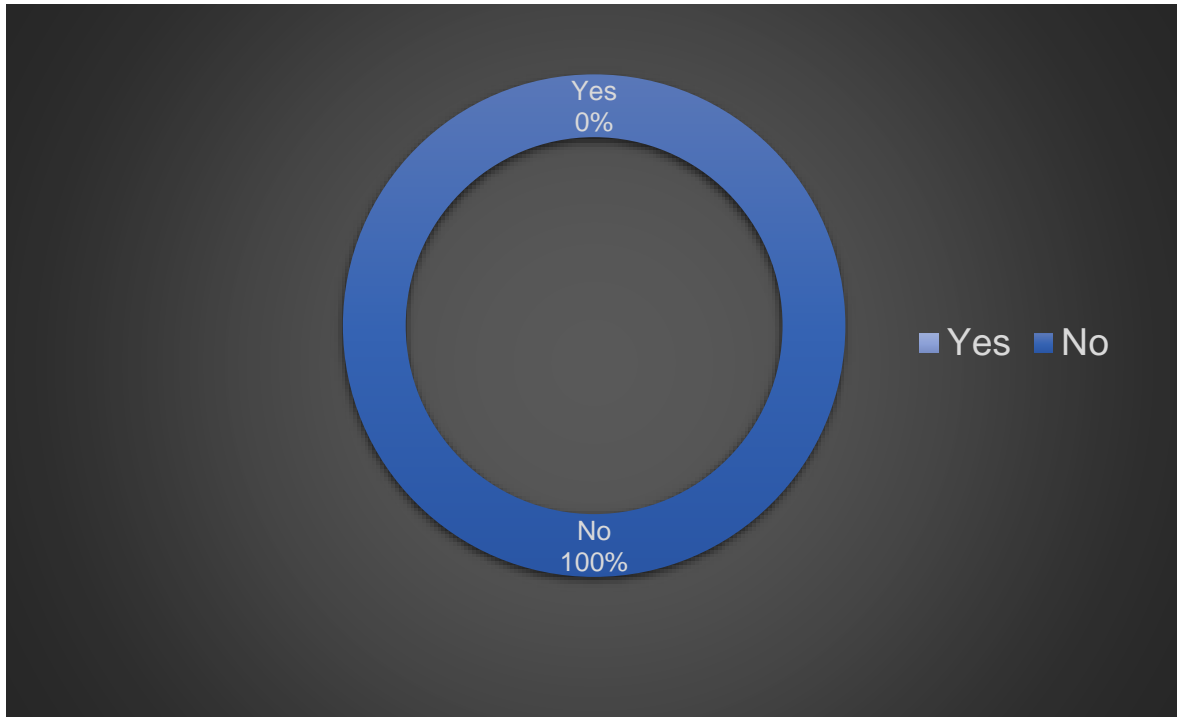
Figure 4 20: *Experience with electronic filing*

4.5 Challenges and benefits

4.5.1 Primary administrative problems in the selected public healthcare facility

(Questionnaire attached as Appendix C)

The following relate to the perceptions of both patients and staff members. The study's participants were asked to select as many as possible options regarding primary administration problems in a chosen public clinic in terms of misfiling, missing files, a lack of resource support, damaged patient folders, as well as a lack of knowledge on the part of staff of the value of patients' records.

In terms of misfiling, Table 4.12, shows that the respondents indicated as follows: 4% - never; 13% - rarely; 74% - sometimes; 32% - almost often; and 24% - always.

Table 4.12 indicates that missing files occurred as follows: 0%: never; 28%: rarely; 70%: sometimes' 28%: almost always; and 24%: always.

As identified by participants in Table 4.12, damage to patient folders occurred as follows: 31%: never; 32%: rarely; 51%: sometimes' 20%: almost always; and 13%: always.

Table 4.12 shows that a lack of support for resources occurred as follows: 48%: never; 13%: rarely; 63%: sometimes; 43%: almost always; and 13%: always.

Furthermore, a lack of awareness of the value of patient records by general staff at a selected public healthcare facility, as illustrated in Table 4.12, was recorded as follows: 67%: never; 16%: rarely;   78%: sometimes; 20%: almost always; and 16%: always

Table 4. 12: *Primary administration problems in a selected public healthcare facility*

	1. Never	2. Rarely	3. Sometimes	4. Almost always	5. Always
Misfiling	4.00%	13.00%	74.00%	32.00%	24.00%
Missing files	00.00%	28.00%	70.00%	28.00%	24.00%
Damage to patient folders	31.00%	32.00%	51.00%	20.00%	13.00%
Lack of support for resources (e.g. insufficient fund, stationery)	48.00%	13.00%	63.00%	43.00%	13.00%
Lack of awareness of the value of patient records by general staff	67.00%	16.00%	78.00%	20.00%	16.00%

4.5.2 Measures that can be adapted to solve the administration problems in a selected healthcare facility

Participants were requested to identify (as many as possible) from the options provided, which measures can be adapted to solve the problems mentioned in Table 4.6. The question revealed the following: 77% of the respondents want to move to electronic filing; 52% indicated more training for staff; 37% said that the facility's management should conduct regular awareness workshops to manage patient information; and 60% mentioned the need for bigger buildings for patient file storage (figure 4.21).
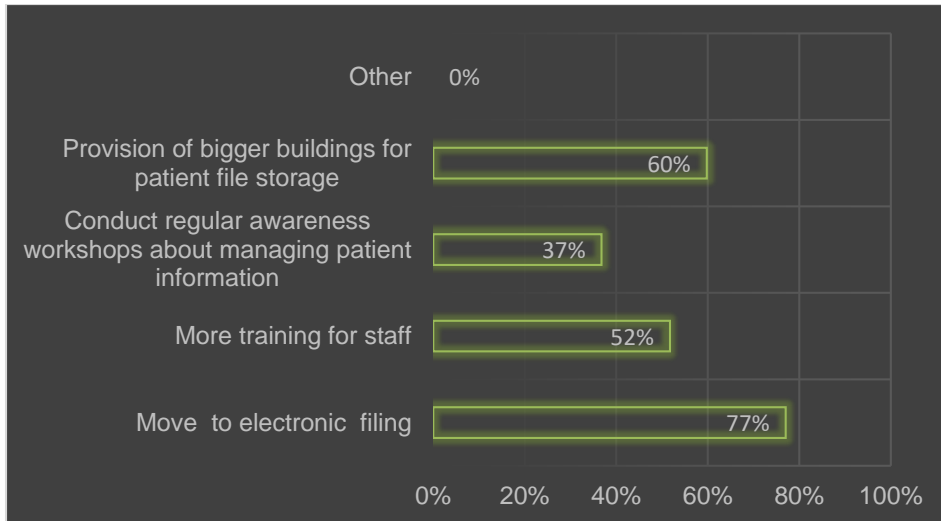
Figure 4 21: *Recommended solutions for problems*

4.5.3 Electronic filing system to help reduce problems in a selected public healthcare facility

The study's participants mentioned various reasons why the facility should implement an electronic filing system (figure 4.22). A total of 68% stated that it would improve retrieval time; 45% said that it would pave the way for a paperless office environment; 53% stated that it would improve filing spaces; 44% said that it would save using stationery; 51% mentioned that it would reduce long queues for patient files; and 8% chose 'other' as a reason.
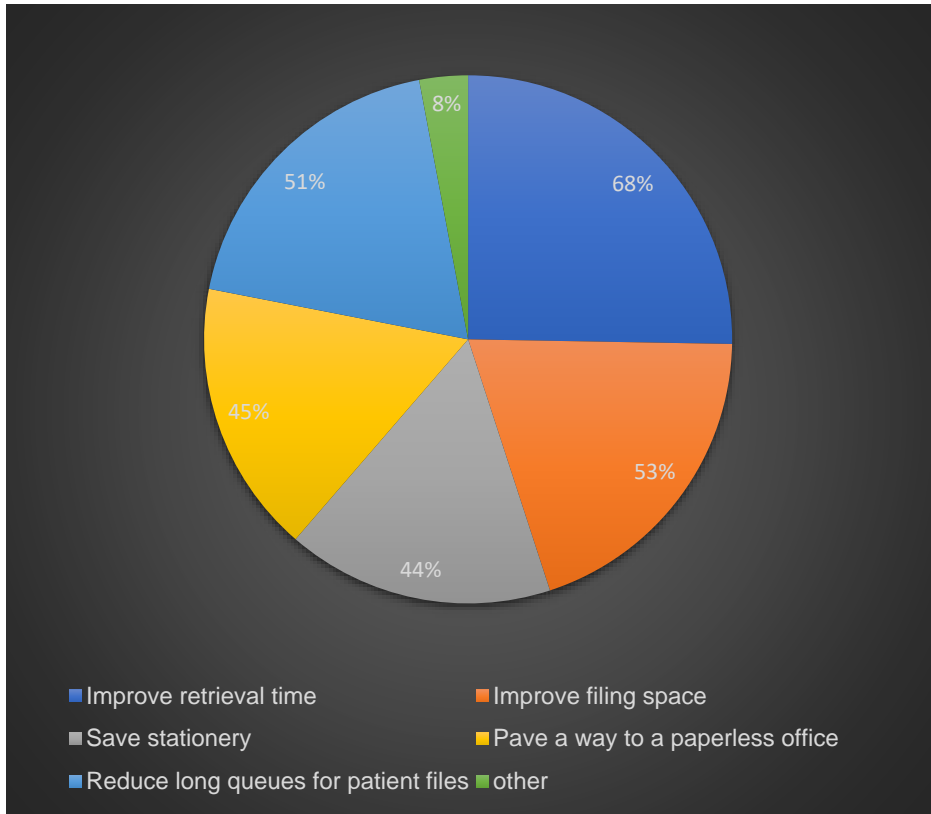
Figure 4 22: *Possible benefits of electronic filing in the selected public healthcare facility*

4.5.4 Disadvantages of an electronic filing system in a selected public healthcare facility

The study's participants were asked about the negative impact that electronic filing might have on the selected facility's daily processes and responded accordingly. A total of 47% of respondents indicated that a lack of users' system skills may have a negative impact on the daily processes of the facility, while 61% said that when the system is offline it could have a significant impact, and 50% mentioned the system responding slowly. A further 35% stated that the system would be difficult to use, while 50% stated a lack of training, and 8% indicated other as having a negative impact on the facility's daily processes (figure 4.23).
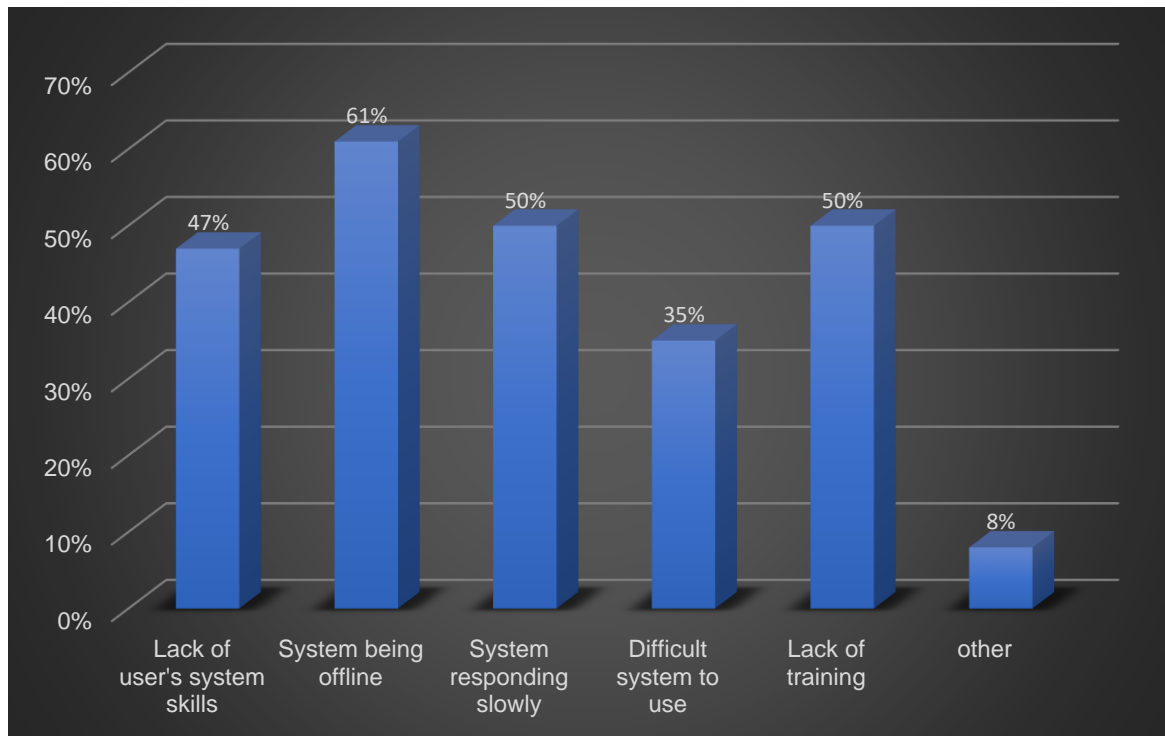
Figure 4 23: *Possible disadvantages for the facility's daily processes*

4.6 Considerations for selected healthcare facility

Ensuring effective and efficient service delivery in a selected healthcare facility.

The following open-ended question was posed to make sense of the respondents' respective responses: "Do you have any suggestions to improve the current daily processing of patient records?" The following outline the study's participants' responses.

4.6.1 Clinical Staff Members Perceptions (Training, confidentiality)

In response to the open-ended question regarding suggestions to improve the current daily processing of patient records in a selected public healthcare facility, clinical staff members' suggestions were as follows:

A) Respondents 3, 5, 9, 11
- "There is a huge need for proper shelving to file patient files properly and orderly";
- "Personnel training is imperative";
- "Proper shelving is required for files, as well as a lockable file room";

B) Respondents 13, 15, 16, 20

- "Confidentiality of patients' information";
- "Confidentiality must be stored in the records place"; and
- "There must be confidentiality for patients' records".

C) Respondents 3, 5, 11

- "Personnel training is imperative";
- "Training for all staff members and support of resources"
- "Training for all staff members should be effective, and they should be provided with the required resources"; and
- "By helping each other all the time to make sure all patients are recorded in time"

4.6.2 Patients Perceptions (electronic filing, storage space, training/ workshops)

In response to the open-ended question regarding suggestions to improve the current daily processing of patient records in a selected public healthcare facility, patients' suggestions were as follows:

A) Respondents 11, 15, 16, 17, 19, 20, 21, 22, 24, 25 27, 28, 30, 34, 35, 73, 80, 84

- "Introduce electronic filing to save time, and reduce the time that patients spend waiting for their respective files";
- "Computerise the filing system for time efficiency";
- "Use computers (improve facilities). To train more workers. To open 24/7 Be open 24/7";
- "My suggestion is to have electronic filing system in place as it will make things easier. They must have plan B for when the system is down"
- "Computerise the workforce".
- "Move to electronic filing to save time and avoid user queues looking for one file"

B) Respondents: 14, 31, 32, 47, 49, 54, 68, 86, 87

- "More building space to store patients' files";

- "Bigger administrative space is required while, staff numbers should be increased";
- "Provision for bigger buildings to store patients' files"; and
- "Due to the increasing number of patients, the building should be enlarged".

C) Respondents 28, 51, 63, 60, 75, 85

- "Provide enough resources";
- "Communicate effectively with patients";
- "Conduct awareness workshops and educate workers on the *Batho Pele* principles. Workers should be taught how to communicate with patients"; and
- "More training workshops for staff to render them more effective".
- "Train more staff to improve their skills when it comes to filing, and to distribute patient folders in a more efficient manner".

D) Respondents 44, 45, 49

- "Hire more staff";
- "Hire more nurses"; and
- "Nurses must be able to help us to avoid the clinic being full without them being helped".

E) Respondents 56, 60, 62, 63, 64, 74

- "Prepare patients' treatment ahead of time, as the clinic treats different illnesses on a weekly basis";
- "Keep a record of all treatments for weekly schedules to enable efficient services";
- "Categorise patients for efficiency purposes, for example, sick people in one section, pregnant women in another, and so on, to avoid chaos and so that they can be treated timeously";
- "Those patients who attend the clinic for various treatments should receive these promptly without having to explain their cases to nurses upon each visit";
- "Patients and staff should work together by being more responsible with their files"; and
- "They should also assist each other to ensure all patients are recorded timeously".

4.7 Discussion of Findings

4.7.1 Demographics

The study's participants were probed about their respective demographics as means to profile them.

Respondents' characteristics

- The research sample consisted of 26 clinical staff members and 87 patients at a selected public healthcare facility in South Africa, and all of them were 18 years and older (Figure 4.5).

- Most respondents had been employed at the selected public healthcare facility for 2- 3 years (see Figure 4.8) and proved to be aware of the clinic's daily processes.

- Most of the participants sampled for this study comprised patients, most of whom visit the clinic once a month (see Figure 4.9). They seemed to be aware of the clinic's operations and suggested ways to improve the clinic's current daily processes (see Section 4.6).

4.7.1.1 Participants' gender

In terms of gender, as shown in Table 4.8, majority of the respondents are females, while a minority are males. The study indicates that the females were more responsive than the males and appeared more supportive too. This analysis/research result in respect of gender correlates with Thompson and Conradie (2011), who mention that women's willingness to participate in community duties is far from politically apathetic, and that their aspirations and instincts as women are to protect and ensure greater socio-economic security and wellbeing, for both their families and themselves.

4.7.1.2 Participants age groups

The highest number of respondents, in terms of age (see Table 4.9), ranged from 18-24 (44%), followed by 25–34 (29%). The conclusion that these respondents are primarily part of two generations, identified as creative thinkers, can be rendered as being specified (Hoekstra, Lashley and Cavagnaro, 2015:108) into the following two categories:

- Generation X: those who aspire to be imaginative, casual, self-reliant and free; and

- Generation Y: those who strive to attain authenticity, incentives and broader experience.

4.7.1.3 Types of position

The selected public healthcare facility's clinical staff occupied positions, ranging from district managers, health area managers, facility managers, professional nurses, enrolled nurse assistants, nutritional advisors, data capturers, and administrative clerks. This study revealed that, amongst the respondents, 8% were administrative clerks, and 4% were administrative officers (see Figure 4.7). Administration is a significant facet in the health care facility's operations, since it is essential and the first point of patient care. It is essential, as those who work within it are usually the first to engage with the patients and acquire data from them. The facility's department comprises administrative clerks and data capturers, whose tasks and responsibilities include managing vast volumes of information, which is used for different purposes across the facility.

Administrative clerks

The administrative clerks capture patient information manually; this is restricted to socio-economic and alternative related fields; however, they do not probe or capture the reason/s for the patients' visits. This makes them an essential source of patient data. The administrative clerks work closely with the data capturers, as they conduct similar tasks; however, data capturers are accountable for the data.

4.8. State of patient records management

In healthcare, time has been considered to be one of the significant measures of service quality, and service quality is the basic and most important factor that impacts customer quality (Alshurideh et al., 2017:151). A source of dissatisfaction among patients can affect the outcomes of patient care, furthermore, waiting time in hospital outpatient clinics affect patient overall satisfaction, access to care, health outcomes, trust, willingness to return and hospital revenue (Sriram & Noochpoung, 2018:2692). This study shows the time that respondents had to wait before receiving

their medical files: 15% of the respondents indicated that they waited for 1-30 minutes, 20% waited for 30-60 minutes, 34% waited for 1-2 hours, and 31% waited for 2-3 hours (figure 4.10). A study done by (Aburayya et al., 2020:1271) on factors affecting patient waiting time in primary healthcare centres, show that:

> a large number of patients at the clinic site were the most contributors to the lengthy waiting time issue, a low number of staff in one shift including physicians together with staff being asked to perform other non-related duties, too many forms to be filled by centres' staff, lack of timely presence of physicians and low speed of the medical staff in handling the patients, poor effective communication system between patients and healthcare centre…

This study indicated possible factors that cause patients to wait longer than the facility's set timeframe to retrieve patient folders: missing files (20%); staff shortages (30%); high patient folder demand (10%); misfiling (30%); and untidy filing (10%) (see Figure 4.19). A key to success in quality improvement efforts in healthcare is the coordination of patient care efforts through better information management. Extending Hospital Health Information Management System (HHIMS) to cover the medical clinic would enable the elimination of delay in retrieval of clinic records (Maduragoda, 2020:282)

The first objective of this study was to determine the status of the management of patient records, and whether this obstructs the provision of healthcare services in a selected community healthcare facility. This section was geared towards establishing the present condition of patient records in a selected clinic. These inquiries included a general rating of the condition of the records, the executives, and the reasons for the present state - whether positive or negative. Participants also rated the turnaround time for patient files' retrieval and patient waiting times. The clinic's state of management of patient files was certainly found wanting. The study revealed that 27% of the participants mentioned that patients' files were managed poorly in their institution, and 15% of participants indicated that it was very poorly managed. In total, 42% of the respondents indicated the poor state that the facility seems to be facing.

The literature reviewed showed some challenges arising from poor record management practices in different countries in Africa. Yaya *et al.* (2015:2) indicate

that poor medical recordkeeping management tends to adversely affect patient care, as the clinical treatment of patients is structured and depends on their case history contained in their respective medical records. A similar challenge was identified in an Ethiopia study, which Wong and Bradley (2009: 254) identified, they found that there were four distinct points of patients' registration, and each point uses its independent patient registration logbook; however, there was no central storage system for medical records. This would at times cause patients to share the same medical record number. They reported that: "the patients' registration numbers were reproduced; there were frequent missing and, in some cases, incomplete medical records, hence patients were allocated new enlistment numbers; clinical data was recorded on scraps of paper; and patients' medical records were filed incorrectly". In the continuum model the stages that the records undergo are recurring and reverberating activities that fall both within archives and record management (Upward, 2000). It further aids in enhancing the record life cycle model by covering the operations in electronic medical records management and paper-based medical records management. For this study, the record continuum model dimensions were not applied for electronic medical records management because only the paper-based medical records are applied fully in the selected community healthcare facility.

According to a study that Ngoepe (2008) conducted, proper records management enables an organisation to control the age and development of records, efficiently retrieve and dispose data. The author further states that proper records management enables an organisation to acclimatize new data technologies, guarantee administrative consistence, limit litigation risks, cut expenses and spare time and efforts doing tasks that would take longer to complete when there is lack of proper records management. One of the key resources required to operate an efficient and effective organisation is information, particularly since well organised records:

- Enable an organisation to find the right information easily and comprehensively;
- Enable an organisation to perform its functions successfully and efficiently, and in an accountable manner;
- Support the business in respect of its legal and accountability requirements;

- Ensure that the business conducts itself in an orderly, efficient and accountable manner;
- Ensure the consistent delivery of services;
- Provide continuity in service delivery when staff leave;
- Support and document policy information and administrative decision-making;
- Provide continuity in the event of a disaster;
- Protect the interests of the organisation and the rights of employees, clients, as well as present and future stakeholders;
- Support and document the organisation's activities, developments and achievements; and
- Provide evidence of business in the context of cultural activity and contribute to the cultural identity and collective memory of the nation (National Archives and Records Service of South Africa, 2007: 1).

4.9 Formal training to manage patient files

The second objective of this study was to identify the main reasons for misplaced folders that hinder delivery of services in the selected community healthcare facility. In this section the researcher needed to ascertain the level of employees' capability, skills, as well as training within the selected public clinic, namely wherever health services are rendered to health users. The queries posed during this section embody staff members' academic levels, fields, job titles, length of labour expertise, and management of patient records training.

The research study revealed that 50% of the respondents received formal training to manage patient files, while the other 50% said that they received no training (see Figure 4.12). In any event, preparation was indeed offered, as expressed by the 50% of respondents that received training. In terms of the competency level of the training, 42% of the respondents claimed that the training offered by the facility was basic (see Figure 4.13). Furthermore, 38% of the respondents affirmed that the training was offered in-house by internal staff (see Figure 4.14), and 46% of respondents likewise expressed that the training was offered in-house by the manager (see Figure 4.15).

Moderating this challenge may include implementing approaches such as arranging training programs for health care workers to keep them updated with developments in the delivery of health care, as indicated by some respondents. Similarly, Khalifa (2013: 133) suggests that to tackle the challenge, it is imperative that the importance of any record system and their application become an integral part of the medical education program. In this context, proper training of health care providers should include equipping them with skills and the ability to manage patient records accordingly, with an outcome of minimised missing patient files. Critical success factors (CSFs) theory determines the essential factors (such as training) that an organization must have to enable success project implementation.Project organizations are vigorously dependent on their deliverables to be creative and innovative and create value (Keeys & Huemann, 2017:1197). Organizations that implement the most advanced technologies and the best techniques to monitor their resources obtain a competitive advantage by assigning resources to the appropriate projects (Martens & Carvalho, 2017:1087).

Chapter 1, part ix of the Training and Education of the Public Service Regulations, 2001, as amended, states that "employees should have ongoing and equitable access to training geared towards achieving an efficient, non-partisan and representative public service. Training should support work performance and career development. It should become increasingly driven by needs, and link strategically to broader human resources management practices and programmes aimed at enhancing employment equity and representativeness" (Republic of South Africa, 2016).

4.10 Average turnaround time for retrieval of patient information/folders

The third objective of this study was to assess if paper filing supports or diminishes the effectiveness of service delivery at a selected public healthcare facility, which the study used. The literature review highlighted that when patients' information is managed properly and filed accordingly, it will render information retrieval much more efficient. Conversely, storing information or patients' files electronically, according to the organisation's preference, or even by using unique numbers, may improve the health workers' morale, especially when they know that they do not have to spend copious amounts of time in filing rooms, as the required information will

merely be a click away. Searching for patient information can be simplified by using search engines, while information can be retrieved easily and timeously. When information is captured without unnecessary mistakes, health workers can use search engines by typing keywords, or other relevant information in respect of their system to access patient information (Wassermann, 2001:16).

As shown in Figure 4.16, 77% of the respondents agreed that the institution has a turnaround timeframe to retrieve patients' folders; however, 23% disagreed with the said question. Of the 77% participants that responded in the affirmative, 50% claimed that the average retrieval turnaround time for the folders ranged from 1–30 minutes, while 23% said that it took at least 1–2 hours, and 4% claimed that it took anywhere from 2-3 hours (see Figure 4.17).According to Figure 4.18, in response to the question relating to how long patients waited to receive their folders, 50% stated that they normally waited for 1-30 minutes, 35% said 2–3 hours, 8% claimed 30–60 minutes, and 4% said 1–2 hours.

However, staff members' perceptions differed in respect of the time that patients had to wait before they received their folders. For instance, when patients (health users) were asked how long they waited before they received their folders (medical files), 15% claimed that they waited for 1-30 minutes, while 20% said 30-60 minutes. Moreover, majority of the respondents, namely 34% said that they had to wait for 1-2 hours, followed by 31% that said 2-3 hours, this means that more than half of the patients had to wait longer than the average patient information retrieval turnaround time of 1–30 minutes, as claimed by 50% of the respondents (clinical staff). This waiting period impacts the extent of patients' fulfilment, since waiting in long queues frequently leads to dissatisfaction and frustration, and can incur excessive expenses, for example, intensifying of one's ailment while waiting.

Reasons for deferrals in retrieving the files might be owing to the following factors:
- Inappropriate documenting frameworks, and backlogs in documenting clinical notes;
- Insufficient shelving, leading to records being placed on floors.
- The absence of control over the creation of records for admission purposes, hence when clinic numbers are apportioned to patients, records

are often incomplete or lost, since only one individual is responsible for them;

- The moderate retrieval procedure can likewise be ascribed to untrained staff, deficiency of recovery devices, and the utilization of manual frameworks;

- Patients who visit and cannot recall their last visit, will necessitate a search through all their medical records, which will involve quite a bit of repetition; and

- The impact of postponing records recovery brings about deferred basic leadership, postponed restorative consideration for patients, and an absence of consideration for patients. Postponing records recovery may likewise prompt trading off the nature of therapeutic consideration offered to patients at the clinic, as specialists will come up short on fundamental data expected for patients' wellbeing (Chikuni & Mnjama, 2010: 25).

Conversely, decent record management will enable any organisation to upgrade its record keeping framework to enhance information retrieval with correspondence improvements in office proficiency and profitability (Ngoepe, 2008: 42).

4.11 Causes of delay in retrieving folders

Major causes of delays in retrieving folders stems from a lack of capacity, as well as aptitude and training on the part of administrators, in addition to a lack of commitment from them. Utilization of manual records, absence of documenting space, a poor foundation, as well as clinical staff members not being acquainted with record keeping, and a further lack of organisational framework are also contributing factors to this dilemma. Deficiency of staff can also impact patients' waiting time, as well as the overall service delivery of any public clinic.

Considering specific causes/reasons why patients would wait longer (to receive their medical folders) than the set timeframe to retrieve patient information, 30% of the respondents indicated that it is because of staff shortages, 30% indicated misfiling, 20% said missing files, 10% said high patient folder demand, and 10% indicated untidy filing (Figure 4.19). Health information management plays a noteworthy role in the health sector. The World Health Organisation (WHO) supports the management

of health systems by guaranteeing that the correct health information is given to the correct individual and at the correct place and time in a secure, electronic form to optimise the quality and proficiency of the delivery of health services. In contrast, Hakes and Whittington (2008: 235), in their studies, indicate that implementing Electronic Medical Records has various impacts, for example, it increases medication and/or documentation task times.

The fourth research objective of this study was to understand the awareness of personnel with regards to information management technology. Stemming from Figure 4.20, when respondents were asked if they had ever used an electronic filing system before, all of them said that they had not. Even though the participants had never used electronic filing before, they envisaged possible benefits that computerised patients' records could introduce, for instance, improve filing space (see Figure 4.22). The researcher perceives that the clinical staff would have to unlearn knowledge of managing paper filing systems to be able to learn new knowledge management when the facility adopts the use of electronic filing systems. If the facility decides to adopt the use of technology to manage patient records, the Critical Success Factors (CFSs) theory by Rocktart (1979) will have to be considered for it determines the essential factors that an organization must have to enable success project implementation.

As far as new system implementation is concerned, knowledge management also plays an important role when it comes to factors that contribute to inefficiencies. Davenport (2000: 163-180) points out that organisations often experience poor systems implementation owing to their ignorance of knowledge management issues such as requiring consultants to transfer knowledge. Bancroft (1996) suggests that effective transfer of knowledge from consultants to consumers is critical for the success of a system's implementation. Nevertheless, the transfer of knowledge from a consultant to a client organization is particularly difficult owing to knowledge embedment (Pan *et al.*, 2001: 321-328).

Furthermore, another obstacle to electronic health/medical record implementation is health care workers' resistance to its adoption, perceiving that this kind of system would hinder their work processes or even lead to job losses owing to their failure to

learn the system (Katurura & Cilliers, 2018: 3). However, the respondents in this study were enthusiastic about the prospect to switch from a paper-based filing system to an electronic one, as majority of the respondents recommended and suggested that the facility should adopt electronic filing, because they envisage that it will improve the delivery of patient care, as well as improve their work (see section 4.6 for respondents' suggestions). Technology Acceptance Model (TAM) suggest/state that the attitude towards accepting a new system is dependent on its perceived ease of use. Moreover, Information technology is a key source of interaction between healthcare providers and patients (Iftikhar & Saqib, 2019:2). In addition, willingness of healthcare professionals to utilise any software/applications of information technology is important for the successful implementation of electronic medical records. The Theory of Reasoned Action (TRA) by Fischbein & Ajzen (1975) shows that technology acceptance is determined by one's intent to use technology (behavior) and the influence of others on using the technology (subjective norm or social influence).

4.12 Challenges and benefits of the paper-based filing system, and electronic filing at the selected public healthcare facility

4.12.1 Primary administrative problems in the selected public healthcare facility

The fifth objective of this study was to identify the benefits and challenges of the paper-based filing system, and electronic filing at the selected public healthcare facility. The literature discussed in Chapter two stresses that the disadvantages of medical records that are handwritten may be difficult to read. Storage is also a disadvantage of using a paper-based filing system, as information can be lost, and files could be destroyed or stolen. An advantage of using paper is that humans do have a greater connection with writing. In addition, in the event that administrative personnel have to complete a great deal of worksheets with patients in session, it is anything but difficult to toss those papers in a document, as opposed to checking and transferring/scanning all you need in the patient's record (Hall, 2016).

Conversely, a disadvantage of an electronic filing system is that when the system crashes over a period of time, it can be devastating. Furthermore, a noteworthy benefit of an electronic filing system is that it improves processing flexibility, and enables simplicity when retrieving patients' records (Bleich & Slack, 2010: 2). Hence, a doctor can prescribe or administer appropriate treatment as indicated by clinical rules, with a lower danger of unfavourable ramifications on patients' wellbeing. Thus, clinicians are helped by producing increasingly precise patient medical reports for their convenience (Sittig & Singh, 2012: 1481).

The study shows that the highest reported challenge that the facility faces is a lack of awareness of the value of patients' records amongst staff, generally, ranking at 78% (see Table 4.12), and it is possible and understandable that a lack of general staff awareness ranked high for this study because not everyone received training in this regard (see Figure 4.12). Training is an organizational intercession planning tool to prepare workers by providing them with fundamental knowledge, skills and abilities to perform their employment. Training is both noteworthy and profitable for the employer and employee, because when an employee obtains modern information and abilities, he/she can carry out proficient obligations, or indeed perform more inventive and complicated tasks. Hence, training could be a great opportunity for consequent proficient advancement and/or career development for employees (Kucherov & Manokhina, 2017:121). Conversely, Bradford, Rutherford and Friend (2017:133) contend that training could be a systematic strategy utilized to construct a person, group and authoritative adequacy.

Furthermore, Ogunyomi and Bruning (2016:612) note that training centres should focus on aptitude improvement, which is accomplished through on the job, as well as off the job strategies. On the job training has been characterized as work enlightening given by the administrator, in which workers learn by watching their peers, in conjunction with working with the resources and offices that form a portion of the job Kang, Shen and Xu (2015:229). Off the job training has been defined as a physical urban locale absent from the work environment where training takes place (Haruna & Marthandan, 2017:168).

A lack of training in administration and/or management of records can be seen as a contributing influence for files that are missing at times. In an institution/ service rendering facility, where the competency and aptitudes of staff members are not developed, and the survival of the institution is not guaranteed. Khalifa (2013:133) suggests that it is important to improve awareness of the importance and benefits of medical records, while their applications/documentations should become an integral part of medical education and training programs as a way of tackling the challenge.

4.12.2 Measures that can be adapted to solve the administration problems in a selected healthcare facility

The clinic's administrative problems such as a lack of awareness of the value of patient records by the general staff, a lack of resource support, damage of patients' folders, missing files, and misfiling, should be addressed accordingly. Participants indicated that certain measures can be adopted to address the above problems (see Figure 4.21). A majority of the respondents (77%) indicated that moving to electronic filing should help to solve problems that the facility faces, while (60%) of the participants indicated that there should be provision for bigger buildings for patients' file storage, 52% indicated that more training is required for staff members, and 37% mentioned that regular awareness workshops should be conducted to manage patients' information.

When organisations experience inefficiency through their current systems, it leads them to opt for a new system; internal and external poor communication has a great impact on efficiency levels, and on implementing new system, while sustained management support is also vital. The Diffusion of Innovation (DOI) theory learning and communication process influence the adoption of innovation. According to Bhagwani (2009:14), sustained management support is important, both at the beginning and at the end because, at the start, senior management must assist with the project's execution, and provide the necessary resources for the project. Hence, there is a need to promote the use of the platform and aid in engaging users.

4.12.3 Electronic filing system to help reduce problems at a community healthcare facility

The sixth research objective of this study was to explore the effects of technology on information management on health workers and patients at the public healthcare facility. It is not easy for the human brain to remember things, yet knowledge of medicine that should be absorbed is expanding geometrically. It is hard for the human brain to retain volumes of data within any given timeframe. With the assistance of technology, particularly personal computers, people can store large amounts of information and can recover it when necessary. Rapid advances in technology and persistent increments in performance lists have made information technology appropriate at all levels in medical services and patient management. It is not easy for doctors to keep up with the rapidly increasing changing conditions of medical knowledge, and to comprehend what these progressions mean for the treatment for individual patients' care. IT-based decision supportive networks could help doctors to continue to learn about new medication. Health Information Technology facilitates comprehensive management of medical information, and safe communication between health workers and health users (Gulavani & Kulkarni, 2010).

The communication of patient data is to provide patients with quality care. At the selected public healthcare facility, correspondence is conducted by using paper-based health records and verbal communication between various stakeholders in the same organisation; nonetheless, these patient records must be seen at a solitary point in time. Van Bekkum and Hilton (2013:1-9) argue that correspondence practices and the role of healthcare workers in this regard, are significant for patients' health outcomes.

As expressed before, paper-based patient records are utilized as a means of correspondence at the selected healthcare facility. This study and literature review showed that paper-based records have various impediments (see section 2.2.2). Compelling communication between medicinal service workers is fundamental to affect the link between patient care and basic leadership. Without compelling correspondence methods in healthcare, serious medicinal mistakes can occur,

prompting mortality cases. Furthermore, Rosen *et al.* (2018:433) state that communication failures are both an autonomous reason for preventable patient mischief and a crosscutting element that lead to other harms. Transitions in treatment in acute care environments (i.e. between care areas or changes in shifts) are leading opportunities for interaction errors that directly cause damage to patients. These situations can result in miscommunication about a patient's status and possible prognosis plans, prompting delays in treatment or improper treatments.

The findings of the study revealed that an electronic filing system could help to improve daily business processes and service delivery in the facility. Technology Acceptance Model (TAM) suggest/state that the attitude towards accepting a new system is dependent on its perceived ease of use. Davis (1989) defines perceived ease of use as "the degree to which a person believes that using the system will be free of mental effort". According to the participants, 68% of the respondents perceived that an "electronic filing system can improve retrieval time", while 53% of the respondents indicated that the reason why they would opt to have an electronic filing system at their facility is because it would improve filing space (see Figure 4.22). More significantly, it was also found that an electronic medical record system could remedy many of the limitations of a paper-based system. Humpage Liuzi (2010:7) concurs that EMR systems have proved to be efficient and value-effective to improve the quality of health services, as they allow large amounts of data to be stored, whilst promoting the rapid recovery of data to reduce time pressure on health workers. EMR structures improve the availability of health records in addition to the health-quality and accuracy of patient data.

4.12.4 Disadvantages of an electronic filing system at the selected public healthcare facility

When participants were asked to tick as many options as possible regarding the perceived negative impact that electronic filing might have on the daily processes of the selected public facility, the option that received the highest number of selections, namely from 61% of the respondents, was the system being offline (see Figure 4.23). Power supply in the selected clinic's location was generally poor or flighty. Internet availability can change the progression of data in the clinic through viable data management systems and correspondence frameworks.

In an era of accelerating the digitalization of patient records, accessing electronic patient folders and creating patient identifiers can be dangerous and/or problematic without constant and reliable power supply (Ardagh, *et al.*, 2012). A further option to preserve and store patients' medical records is the use of a distant server or cloud computing, which also means that the records can be accessed at any time or from any place. One study showed how patients were able to receive prescriptions and booked medication, as arranged, during Hurricane Sandy owing to the advantage of cloud computing (Jan & Lurie, 2012). SanJoaquin, Allain, Molyneux and Benjamin (2013:3) identified a few EMR related difficulties, including incessant power failure. Nonetheless, the issue of delayed power blackouts was tended to by adapting a dependable reinforcement control framework in conjunction with efficient computers. To compensate for the deficient power supply to the clinic ensuing from the nation's insufficient electricity, the clinic may resort to different sources of power such as generators and, alternatively, solar energy.

In addition, as some respondents revealed in this study (35%), the lowest rated perceived negative impact that electronic filing might have on daily processes in a selected public health care facility is that the system may be difficult to use. According to Boonstra and Broekhuis (2010:8), EMR suppliers seem to think little of the degree of PC aptitude required from doctors, while staff members perceive the program to be difficult for them to use in health care practices.

Furthermore, staff members will require an effective degree of typing aptitude to place patients' medical data and prescriptions into the EMRs. Despite the benefits of using EMRs, there is still a low rate of adoption of these systems. Uses of electronic medical records include involvement of certain characteristics of users and programs, and assistance from other and various facilitators of organisation and community. Moreover, the use of electronic medical record is difficult owing to the presence of barriers (Ajami & Bagheri-Tadi, 2013: 133).

4.13 Considerations for enhancing the selected public healthcare facility

The following open-ended question was posed to make sense of the respondents' respective responses: "Do you have any suggestions to improve the current daily

processing of patient records?" The following outline the study's participants' responses.

Table 4. 13: *Commonalities of Patients Perceptions and Clinical Staff Members Perceptions for this study*

Common respondents' perceptions
Both health workers and patients indicated that the facility needs to hire more staff.
Both patients (health users) and staff members (healthcare workers) are concerned with the protection hazard that paper-based records pose – from different perspectives
Both patients (health users) and staff members (healthcare workers) are concerned with the protection hazard that paper-based records pose – from different perspectives.
Participants mentioned that the facility must introduce electronic filing to save time, and reduce time spent waiting for one file.
Participants mentioned that there should be support for enough resources from different perspectives (i.e. patients indicated that sometimes they do not receive all the medication that they need, while staff members mentioned that there is a huge need for proper shelving to file and store patient files).
Participants suggested that the facility should conduct awareness workshops and educated workers on the government's Batho Pele principles
Participants mentioned that patients' records must be treated confidentially.
Participants mentioned that staff training is imperative.
Both patients (health users) and staff members (health workers) mentioned that the facility requires bigger buildings, albeit for different reasons (i.e. patients indicated that there is a need for space owing to the enormous amount of patients that visit the clinic daily, and staff members mentioned that there is a need for bigger buildings for patient file storage, and to increase administrative space).

4.13.1 Ensure effective and efficient service delivery in a selected healthcare facility

The seventh research objective of this study was to investigate what modifications can be done to improve current daily processes at the selected public healthcare facility's current daily processes and operations. The following open-ended question was posed to gauge respondents' perceptions of the following: "Do you have any suggestions to improve the current daily process of patient records?" (see section 4.6 for respondents suggestions).

- *Both health workers and patients indicated that the facility needs to hire more staff.*

Often, when nurses tend to patients, they have to record data on several documents/forms, and the issue of staff deficiency can hence affect record keeping

adversely. A shortage of staff can cause nurses to be exhausted at most times, as they often 'go the extra mile' when engaging with patient-care related tasks, leading poor record-keeping of such exercises and tasks in the patient's folder/record. The facility's staff also reflected that the expanded workflow relates to staff deficiency, as well as an increasing number of patients. Mutshatshi, Mothiba, Mamogobo and Mbombi, (2018:4) indicate that medical attendants are progressively being made privy to the function of clinical records in health care litigation in spite of the dearth that they are encountering. However, medical attendants must guarantee that their notes are "meticulous" from a lawful point of view too, because an activity that is not archived, is considered as not done.

- Both patients (*health users*) and staff members (*healthcare workers*) are concerned with the protection hazard that paper-based records pose – from different perspectives.
- Participants mentioned that the facility must introduce electronic filing to save time, and reduce time spent waiting for one file.

According to Sani *et al.* (2018:160), the use of electronic records is understood to own an efficient impact on health care delivery, as patients do not have to wait long for their medical information to see a doctor and, conversely, the safety/security of their information is guaranteed. Moreover, patients routinely share individual data with health care providers. In the event that the secrecy of this data was not secured, trust in the doctor-patient relationship would be decreased. Creating a trusting environment by regarding patient's security urges the patient to look for care and to be genuine as conceivable amid the course of the health care visit. In case patients feel that their privacy is not protected in any structure, be it either spoken, written, or transferred, it would make them feel awkward, and hence less likely to share any sensitive data with the doctor or nurse, which could adversely affect their care (De Bord, Burke & Dudzinski, 2013:1).

- Participants mentioned that there should be support for enough resources from different perspectives (i.e. patients indicated that sometimes they do not receive all the medication that they need, while staff members mentioned that there is a huge need for proper shelving to file and store patient files).

- Participants suggested that the facility should conduct awareness workshops and educated workers on the government's *Batho Pele* principles.

The reviewed literature highlights that the "Batho Pele principles provide a standard framework about how public services ought to be provided for improving the proficiency of the public service. It further states that adherence to these standards will ensure the arrangement of great administration that address the general population's issues, and expectations, upgrading consumer loyalty, while maintaining the government's guarantee/promise that access to better than average public service is never again a benefit to be appreciated by a few, but the rightful and legitimate expectations for all natives".

- Participants mentioned that patients' records must be treated confidentially.
- Participants mentioned that staff training is imperative.

Confidentiality is a key virtue to build trust in the relationship between physicians and patients. The medical information of the patient is not only what the doctor receives during the objective observations, clinical exams, and test outcomes. In addition, patients also divulge information, often sensitive, about family life, habits and way of life. Inappropriate information disclosure can endanger the credibility, resources and human dignity of the client. Hence, it is necessary to identify the scope of the problem to keep all medical data confidential (Noroozi *et al.*, 2018:875).

- Both patients (*health users*) and staff members (*health workers*) mentioned that the facility requires bigger buildings, albeit for different reasons (i.e. patients indicated that there is a need for space owing to the enormous amount of patients that visit the clinic daily, and staff members mentioned that there is a need for bigger buildings for patient file storage, and to increase administrative space).

4.14 Summary

This chapter presented the research study's inferential statistics as well as the descriptive statistics and covered the process flow of the questionnaire's administration and analysis. The chapter began by presenting the hypotheses of the

study followed by presentation of the research findings in section A. Section B began by discussing the hypotheses of the study followed by the research findings; participants' gender and age distribution, followed by their levels of education and training. The data analysis revealed that study's selected clinic encountered many administrative related difficulties. These difficulties include, but are not limited to, a deficiency of staff, a lack of skills and competencies, a lack of sufficient resources and infrastructure, and an ineffective record system. The chapter included discussion of the views of the patients and clinical staff members regarding steps/suggestions to improve the clinic. The following and final chapter presents the study's conclusions and recommendations.

CHAPTER 5: RECOMMENDATIONS AND CONCLUSIONS

5.1 Introduction

The main problem that prompted this research is the lack of or poor information management systems in public healthcare facilities, which often interferes with the efficiency of healthcare workers such as nurses, with an associated negative effect on patients. This study was conducted to determine whether the current paper-based filing system used at a public clinic in the Northern Cape Province increases or diminishes the efficacy of service delivery in patient care. The previous chapter presented the research study's inferential statistics and descriptive statistics. The data analysis revealed that study's selected clinic encountered many administrative related difficulties. These difficulties include, but are not limited to, a deficiency of staff, a lack of skills and competencies, a lack of sufficient resources and infrastructure, and an ineffective record system. The chapter included discussion of patient perceptions and clinical staff members' perceptions regarding suggestions to improve the selected clinic used for the study. This final chapter concludes the study and makes recommendations on the basis of the study's findings. This chapter is presented as follows: an introduction; a summary of the thesis; the study's research questions; conclusions based on the research hypotheses and research findings; recommendations for the facility; limitations of the study; recommendations for further research; a concluding statement; and a final summary.

5.2 Summary of the thesis

This research's introductory chapter summarized the analysis question posed in this study, and clarified the objectives set as an attempt to address this issue, while certain questions were posed in support of the objectives set. The foundation of an argument from a scientific research viewpoint is that in public healthcare facilities, a lack of or poor information management system often prevent healthcare workers such as nurses from working effectively and efficiently, causing workers not to be able to provide timely and effective health services to patients. The reviewed literature compared paper-based filing system with electronic filing systems, including their advantages and disadvantages. Record management models, life cycle, and issues relating to legislation and regulatory frameworks were also considered in the study. The research goal was, therefore, to understand the extent to which current paper-filing system practices at the research study's selected clinic supports or lessens the effectiveness of service delivery. Chapter Three furnished the reader with a detailed record of the study's research procedures and methodology. This research

was descriptive in nature, and used quantitative methods, using closed-ended questions and one open-ended question as means to collect data. The fourth chapter analysed the questionnaires' responses. The study's results presented in Chapter Four were analysed and discussed. This discussion led to this final, and concluding chapter.

5.3 Revisiting the research questions

The aim of the research study sought to clarify whether current paper-filing system practices at the selected clinic supports or lessens the effectiveness of service delivery. Participants in this study presented their perceptions, comments and suggestions to improve the current daily healthcare practice(s) and processes for patients at the selected public healthcare facility. The results obtained exceeded the researcher's expectations. Sections 4.1 to 4.5 and section 4.14 of this thesis provide more information in this respect. The research questions were:

Table 5 1: *Summary of Research questions and objectives*

Research Questions	Research Objectives	Data Collection Method
How do patient records obstruct the provision of public healthcare service at a selected public healthcare facility?	**Determine** the status of patient management records that obstructs the provision of public healthcare services at the selected public healthcare facility	Questionnaire
What are the main reasons for misplaced patient folders at a selected community healthcare facility?	**Identify** the main reasons for misplaced folders that hinder delivery of services in the selected community healthcare facility	Questionnaire
How would paper filing support or diminish the effectiveness of service delivery at a selected public healthcare facility?	**Assess** if paper filing supports or diminishes the effectiveness of service delivery at a selected public healthcare facility	Questionnaire
How does clinical staff perceive information management technology?	**Understand** the awareness of personnel with regard to information management technology	Questionnaire
What are the benefits and challenges of both paper-based and electronic filing systems?	**Identify** the benefits and challenges of the paper-based filing system, and electronic filing at the selected public healthcare facility;	Questionnaire
How can moving from a paper-based filing system to an electronic filing system improve healthcare work, as well as benefit patients' lives at the healthcare facility?	**Explore** the effects of technology on information management on health workers and patients at the public healthcare facility; and	Questionnaire
What are the required measures to improve daily processes to ensure best management of information, whilst improving efficiency at the public healthcare facility?	**Investigate** what modifications can be done to improve current daily processes at the selected public healthcare facility.	Questionnaire

5.3.1 How do patient records obstruct the provision of public healthcare service at a selected public healthcare facility?

The findings show that the selected public healthcare facility has various administrative problems such as misfiling and poor state of record management as confirmed by

participants of this study. Poor record keeping results in missing files and lost documents and files lead to delayed service to citizens and this could have a poor image of the public service.

5.3.2 What are the main reasons for misplaced patient folders at a selected public healthcare facility?

The findings show that the state of records management in the public healthcare facility was a challenge. The study revealed that 27% of the participants mentioned that patient's files were managed poorly in their facility and 15% of participants indicated that files were very poorly managed. In total, 42% of the respondents indicated the poor state that the facility seems to be facing. The respondents were probed about the training's competency level offered for managing patients' records in the facility and 42% of the respondents indicated that they received training at a basic level. Both Chapter 2 and Chapter 4 stresses that insufficient and/or lack of training in administration and in the management of records can be seen as a contributing influence for files that are misplaced and missing at times.

5.3.3 How would paper filing support or diminish the effectiveness of service delivery at a selected public healthcare facility?

The literature discussed in Chapter two stresses that the disadvantages of medical records that are handwritten may be difficult to read. The findings show the following as the primary administrative problems in the selected public healthcare facility: misfiling, missing files, damage to patient folders, lack of support for resources and lack of awareness of the value of patient records by clinical staff members. Recommendations on how to effectively manage patient records are discussed in section 5.6.

5.3.4 How does clinical staff members perceive information management technology?

The literature in Chapter Two has discussed electronic medical records together with its advantages. In addition, the study shows that majority of respondents (77%) indicated that moving to electronic filing should help to solve the problems that the facility faces.

5.3.5 What are the advantages and disadvantages of paper-based filing systems and electronic filing systems?

Paper based records are still being utilized in the healthcare sector to a great extent owing to several factors, for instance, healthcare workers are acquainted with paper-based filing systems. Secondly, they do not require significant levels of specialized information and

abilities for electronic recordkeeping. Needless to say, the study's literature reviewed and findings on this question revealed that paper-based filing has various impediments; for example, it may be difficult for people to read illegible handwriting, resulting in mistakes thus jeopardizing the quality of patients data.

Electronic Medical Records (EMR) are viewed as an approach to improve the administration of simplifying patient data, proffer increments in profitability, and lower expenses related to the management of medical information. EMR enables doctors to see a greater number of patients through better access to thorough patient history, that incorporate clinical information, which may assist administrators and doctors with investing less energy looking for information and/or studying and reporting on outcomes. Although such a system can provide all these benefits and more, it may also cause havoc in an organisation if it is not managed properly. This question was discussed in detail in the literature review section in Chapter Two.

5.3.6 How can changing from a paper-based filing system to an electronic system improve the work of healthcare, and benefit the lives of patients at the healthcare facility?

Electronic medical records improve the nature of care, provide security by improving administration, decrease mistakes for prescribed medication, decrease unnecessary examinations, and improve correspondence and cooperation among essential healthcare providers, patients, and different providers associated with healthcare. EMRs collect point of care information through quality improvement programs, field– level intercessions, and insightful and useful research that educate and improve care.

Despite some subjective concerns about implementation expenses and time, electronic medical records improve the working lives of doctors. EMRs have been shown to increase efficiencies in workflow by lessening the time required to draw outlines, improve access to accurate patient data, oversee remedies, improve booking of patient arrangements, and provide remote access to patient scheduling.

5.3.7 Which measures should be taken to improve the facility's daily processes to ensure the best management of information, and improve efficiency at the public healthcare facility?

The study's respondents proffered numerous suggestions in this regard (see section 4.6). Despite the fact that the sample from which data was obtained was limited, the researcher concludes that the findings have still provided important discoveries and insight that could be

adopted by the clinic to improve the facility, and offer timely service – see section 5.6 for recommendations.

5.4 Revisiting theoretical framework(s)

It is imperative to revisit how the different theories suitable for this study as discussed in chapter two; the first theory taken into consideration is referred to as the Technology Acceptance Model (TAM) followed by Theory of Reason Action (TRA), then Theory of Planned Behavior (TPB), Critical Success Factors (CSFs) as well as Diffusion of Innovation Theory (DOI) and Record Continuum Model (RCM). These theories were used in the analysis and discussion of findings in explaining user technology adoption because the public healthcare facility in question continues to make use of the manual patient record management system.

From the analysis and the discussion of findings in the previous chapter, evidence suggest that the electronic patient records management systems are still underutilised in South Africa as patient medical records are still being written on paper and kept in filling room. Despite successful methods for managing patients' medical records as recorded in the literature; findings generated for this study however suggest that there is lack of capacity, as well as aptitude and training on the part of administrators. Moderating this challenge may include implementing approaches such as arranging training programs for health care workers to keep them updated with developments in the delivery of health care, as indicated by some respondents. Similarly, Khalifa (2013: 133) suggests that to tackle the challenge, it is imperative that the importance of any record system and their application become an integral part of the medical education program. In this context, proper training of health care providers should include equipping them with skills and the ability to manage patient records accordingly, with an outcome of minimised missing patient files.

Evidence provided in the findings also stresses that absence of documenting space, a poor foundation, as well as clinical staff members not being acquainted with record keeping, and a further lack of organisational framework are also contributing factors to this dilemma. In contrast to the above, other findings of the study also revealed that an electronic filing system could help to improve daily business processes and service delivery in the facility. The relevance of Theory of Reason Action (TRA), then Theory of Planned Behavior (TPB), Critical Success Factors (CSFs) were used to critically

discuss the findings and objectives of the study. The Diffusion of Innovation (DOI) theory and Record Continuum Model (RCM) was used to discuss findings of data analysed and presented in the previous chapter of the study as well as the research hypotheses guiding the study .

5.5 Conclusions

The research findings indicate that the research objectives, as outlined in Chapter One, have been met. The following conclusions are, based on the research hypotheses, the reviewed literature, as well as the study's results.

5.5.1 Research hypotheses

In light of the interpretation of the results of the present research, following are the main findings drawn:

5.5.1.1 The null Hypothesis one accepted

There is independence between patients (health users) and clinical staff members regarding benefits of computerizing patient records at a selected public healthcare facility.

5.5.1.2 The null Hypothesis two is rejected

The null Hypothesis two is rejected in favour of the alternative hypothesis. There is statistically significant difference between the time patients wait before receiving medical folders compared with the time spent by clinical staff members retrieving medical folders.

5.5.2 Retrieval timeframe

The findings showed that the retrieval time for patient folders at a selected public clinic for this study was 1–30 minutes, as indicated by a majority of health care providers (50%). As patients' needs and expectations for convenience and quality continue to rise, the administration time factor becomes significant. Health care patients expect asset accessibility and a minimal waiting period. Conversely, a majority (65%) of the respondents (patients) wait longer than 1-30 minutes, as shown in the study's results. A total of 34% indicated that they wait 1–2 hours, followed by 31% of respondents who indicated that they wait 2–3 hours, respectively. The main reasons cited why administrative personnel take longer when retrieving patients' folders were as follows: 30% said that it was because of staff shortages; and another 30% indicated that it was because of misfiling. The issue of

effective and efficient service delivery is guided by the *Batho Pele* principles, which suggest that patients should be the focal point of healthcare delivery. In addition to *Batho Pele* principles, the quality of service is about responsiveness, consistency, customer direction, and privacy in service delivery.

5.4.3 Administrative problems in the facility

The findings indicate that the current paper-based filing system that the clinic currently uses have numerous problems associated with it such as damage to patient folders, misfiling and missing files. There was also a lack of training that impacted the facility's efficiency levels, as indicated by a majority (50%) of the respondents. In the event that training was indeed offered as expressed by 50% of the respondents, in terms of competency levels of training, 42% of the respondents claimed that the training was basic. Another problem that was apparent was a shortage of staff, as indicated by 30% of the respondents. Given the prospective problems experienced by the public clinic that this research study selected, the researcher concludes that the facility should hire more staff, and that higher levels of training should be conducted as opposed to mere basic training, particularly since the facility deals with large numbers of patients on a daily basis, and because of staff shortages. This will alleviate the challenge of making time to attend training sessions, whilst also attending to numerous patients on a consistent basis.

5.4.4 State of patient records at a selected public healthcare facility

The public clinic selected for research purposes uses a paper filing system. The state of its patients' records was dismal. Generally, it took a long time to retrieve requested records, while the clinic's infrastructure was also inadequate for the patients' files. This is evident from the suggestion made by a few respondents that "*there is (a) huge need for proper shelves in order to file patients' files properly, and that training for personnel is imperative".* The storage should be sufficiently large to accommodate all existing paper files, and the storage room should be secured and taken care of, as medical records contain essential patient data.

5.4.5 Electronic filing system to help reduce problems at a selected public healthcare facility

The reviewed literature indicated the use of EMR in developing countries, showing that these countries' public health institutions have adapted it because of its perceived positive outcomes of improving and enhancing public clinics in all relevant facets. Moreover, the researcher presented some of the advantages and disadvantages of both paper and

electronic filing systems. Furthermore, the findings presented in Chapter four showed that a majority of the participants (68%) perceived that an electronic filing system would improve retrieval time, pave a way to a paperless office (45% of respondents), improve filing space (53% of respondents), save stationery (44% of respondents), reduce long waiting queues (51%), and 8% mentioned that there are 'other' reasons not included in the research options presented. Given the prospective advantages offered by an electronic filing system, the researcher, therefore, concludes that, if effectively adopted, an electronic medical records system can increase efficiencies in the delivery of healthcare services at the research study's selected public healthcare facility.

5.6 Recommendations

The following recommendations are primarily directed towards the healthcare facility used for this study. In view of the research problem, in order for healthcare workers to succeed in providing timely and effective healthcare to health users (patients), the facility will need to strengthen its record management system that is currently in use. For the facility to maintain a fair waiting period prior to the patients seeing a doctor or nurse, the facility should establish an efficient framework to manage its records. The framework must ensure that records are retrieved faster and timeously. Health providers and administrative personnel must render effective health services at all times without any missing or incomplete information in patients' folders, as this kind of poor administration can compromise their wellbeing and impact their diagnosis and hence subsequent prognosis. The facility's current paper-based record management processes must be reduced or eliminated to ensure that administrative personnel and record managers do not waste time searching for lost or incomplete documents, as this is neither efficient nor becoming of any institution.

5.6.1 Address turnaround time

The clinic's management should address its waiting period delays to enable patients to obtain timely services, as most patients who arrive at the clinic early, are forced to wait long periods to receive their folders. Hence, it is necessary to address the availability of staff members at their respective workstations and, where there is a shortage, more staff should be hired, depending on the availability of services to reduce patients' waiting time.

5.6.2 Improve the state of record management

The first approach to improve the condition of record management should be to incorporate a file management plan to enable administrative personnel to find records that they need quicker and hence reduce patients' waiting time. A file management-planning manual should

provide guidelines to manage patients' records at the facility, using the most reliable and cost-effective means available.

Advantages of better file management include quicker data filing and retrieval of patients' files; less misfiles, and higher levels of staff effectiveness, efficiency and productivity. The storage space for patient records should not be close to water pipes, as these may leak, causing damage to the folders. The storage room must have shelves or cabinets, which should not be wooden, as these may emit hazardous vapour and lead to fires. The best option would be to install coated metal instead of wooden shelving.

The second approach to improve the condition of record management will be to introduce electronic filing system. As much as there is a need to improve the state of records management at the facility, certain paper documents would have to be retained for auditing purposes. Therefore, the researcher suggests that an electronic filing system may be adapted, not as an initiative to completely phase out using paper at the facility, but rather to improve its daily processes, and enhance its service delivery.

5.6.3 Training for staff members

As means to maintain good medical record management, training sessions will be required to help staff members understand their roles and responsibilities. When the facility introduces electronic filing, it should improve its training programs to meet the needs of the users, regardless of their background. The training should improve users' skills and increase their confidence to use electronic systems. Any reforms and/or improvements must be sustainable and effective, and without implementation of these new procedures, the healthcare facility is unlikely to succeed. Consequently, adherence to information protocols must be enforced, with guidelines communicated extensively to staff members. This will not only provide the facility with programs and relevant policies but will also ensure its improved services across all its facets.

5.6.4 Develop a policy to manage patients' records

The facility could approach NARSA – National Archives and Record Administration for advice on developing an efficient medical record management program. The facility should always practice the *Batho Pele* principles by placing the needs of patients first and providing them with adequate and timely information when attending to them. A retention policy would be the most efficient way to implement a retention policy, ensuring that there are rules that must be applied for file storage. If required, a person with authority must be able to review the storage period.

5.6.5 Security measures

Good record keeping is important for patients' continued treatment/care and can reduce the risk of adverse events through loss or untraceable records. Either way, it is essential for policies to be designed to protect both manual and electronic records' data.

5.6.5.1 Paper filing system – security measures

Water, moisture and insects can easily damage paper records. Since paper records are indispensable, a risk assessment is a good idea to find ways to protect them. The facility must establish a framework or system to secure paper records in the event of a fire, flood or any other calamity that could potentially cause harm to the records. The facility should implement smoke detector alarms so that they can act quickly in the event of a fire. A water sprinkler system can damage electronics; instead, installing chemical fire extinguishers should be used as a security measure in this respect.

5.6.5.2 Electronic filing system – security measures

Should the facility implement an electronic filing system, there are certain means to safeguard their volumes information. Patient information should be safeguarded by using passwords. Access control is regularly used to protect patient's data. Information resources should be classified according to the rights, while corresponding data access rights should be allocated to users so that information can be used within the legal scope. Furthermore, an electronic signature and data encryption technology can be used as a security mechanism to ensure that patients' privacy is not violated. The use of a digital signature can easily guarantee information security, credibility and non-repudiation of signatures. Data encryption is another way of protecting the privacy of electronic medical records, because it can protect the privacy of high intensity patients.

5.7 Limitations of the research

The research was conducted at a selected healthcare facility in the Northern Cape Province, South Africa. The study's main focus was to gauge whether or not the facility's management of patients' information supported effective and efficient service delivery in the public healthcare sector. The sample size that the study utilized does not allow for the findings to be applied to all public healthcare facilities.

5.8 Recommendations for further research

Since the discoveries from this research study depended on the assessments of patients and clinical staff members, further research should be conducted, which includes the government, as it is a central/main role player in the public healthcare domain. Government's perspective may even oppose those perceptions, which the patients and clinical staff members expressed. From the recognized impediments to the methodology utilized in this research study, it is suggested that further research should embrace both qualitative and quantitative research processes and compare studies to impartially quantify a portion of the reactions exhibited by participants in this research study.

5.9 Concluding statements

The issue that directed the researcher to this research study is that public healthcare facilities' lack of or poor information management systems interfere with healthcare providers such as nurses conducting their daily job tasks effectively and efficiently. As a result, healthcare providers are often not able to provide efficient and effective healthcare services to their respective users. With increasing improvements in data innovations and the progression of medical health frameworks, electronic medical records, as the most important carrier of medicinal and wellbeing data, have been extensively utilized in hospitals owing to their huge storage capacity, and expanded proficiency of analysis and treatment. Electronic medical records have grown to be a trend instead of the continued use of customary paper medical records.

Participants agreed that concerns such as a lack of general staff knowledge of the value of patient records, damage to patient data, missing files, a lack of resource support and misfiling, and inadequate patient file equipment are major challenges that hinder the effectiveness of service delivery in the public healthcare facility that this research study utilized. The participants agreed with the benefits of introducing electronic medical records at the selected public healthcare facility, especially the ability of EMRs to reduce the amount of time that patients have to wait for their medical folders, whilst improving access to patient information and to strengthen the privacy and safety of patient data, as well as enhance service delivery.

However, the possibility of the study's participants to suggest the use of electronic medical records is based on their perceptions of the virtual improvement of EMR systems compared to traditional paper filing systems. Their perceptions of the benefits of using an EMR system is based on their current daily operations in managing patients' records at the selected

healthcare facility. Therefore, the use of information technology is vital, particularly in public health care, since many companies depend on IT to support their electronic processes, as well as vast amounts of information and expertise gathered or reflected in these computer-based IT/systems.

Despite the fact that this study utilised a small sample, limited to one selected public healthcare facility in South Africa, which limited the generalizability of the outcomes of the study, the research offers significant understanding into reasons to establish an EMR framework at the facility. The study likewise indicated the challenges and difficulties that the present traditional paper system imposes, and how potential utilization of innovation/technology in the public health practice could hypothetically help with these challenges.

5.10 Final summary

This chapter summarized and concluded the research study. It condensed the study's findings and reached inferences, dependent on the findings and relevant reviewed literature. This chapter also offered proposals that can, in general, help the selected clinic, specifically to determine or overcome certain difficulties to manage records effectively and efficiently at their facility.

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APPENDICES

Appendix A: Ethical Clearance

Appendix B: Letter of Consent

Appendix C: Questionnaire for patients

Appendix D: Questionnaire for staff members

Appendix E: Grammarian Certificate

Appendix F: Turnitin Report

Appendix A: Ethical Clearance

Cape Peninsula
University of Technology

**P.O. Box 1906 ☐ Bellville 7535 South Africa ☐Tel: +27 21 4603291 ☐
Email: fbmsethics@cput.ac.za Symphony Road Bellville 7535**

Office of the Chairperson Research Ethics Committee	**Faculty: BUSINESS AND MANAGEMENTSCIENCES**

At a meeting of the Faculty's Research Ethics Committee on **19 February 2019**, Ethics **Approval** was granted to **Dimpho Gift Molebatsi (214196321)** for research activities of **M Tech: Business Administration** at Cape Peninsula University of Technology.

Title of dissertation/thesis/project:	**THE UTILISATION OF AN ELECTRONIC FILING SYSTEM TO OPTIMISE PATIENT MANAGEMENT IN A SELECTED PUBLIC HEALTHCARE FACILITY** Lead Researcher/Supervisor: Prof A Slabbert

Comments:

Decision: Approved

	19 February 2019
Signed: Chairperson: Research Ethics Committee	**Date**

Clearance Certificate No | 2019FBRE618

Appendix B: Letter of Consent

<div align="right">

For Patients

</div>

RE: RESEARCH TO COMPLETE MASTER'S THESIS: THE UTILISATION OF AN ELECTRONIC FILING SYSTEM TO OPTIMISE PATIENT MANAGEMENT IN A SELECTED PUBLIC HEALTHCARE FACILITY

You are invited to take part in the research study mentioned above. The purpose of the research is to determine the extent to which the current paper filing system supports or diminishes the effectiveness of service delivery, where patient care is concerned.

You are requested to complete the attached questionnaire, which forms part of a survey to gather information at the public clinic. Please feel free to ask any questions regarding the questionnaire, or any part of the research that you do not fully understand.

Your participation in this research is voluntary. However, you are free to decline to participate or withdraw from the study without any penalties. Your willingness to assist in this study will be appreciated, as your feedback will provide valuable information, which will be used to accomplish the purpose and objectives of this study.

All information provided will be treated in strict confidentiality and anonymity, and will not be used for any purpose other than this study.

I have read and understand the consent form. I agree to participate in this study.

Participant'ssignature_____Date:_____

Thank you for your cooperation. For more information please contact 082 221 6133.

(Ms)DimphoMolebatsi
Researcher
Date: ---------------------------
Professor A Slabbert
Supervisor

RE: RESEARCH TO COMPLETE MASTER'S THESIS: THE UTILISATION OF AN ELECTRONIC FILING SYSTEM TO OPTIMISE PATIENT MANAGEMENT IN A SELECTED PUBLIC HEALTHCARE FACILITY

You are invited to take part in the research study mentioned above. The purpose of the research is to determine the extent to which the current paper filing system supports or diminishes the effectiveness of service delivery, where patient care is concerned.

You are requested to complete the attached questionnaire, which forms part of a survey to gather information at the public clinic. Please feel free to ask any questions regarding the questionnaire, or any part of this research that you do not fully understand.

Your participation in this research is voluntary. However, you are free to decline to participate or withdraw from the study without any penalties. Your willingness to assist in this study will be appreciated, as your feedback will provide valuable information, which will be used to accomplish the purpose and objectives of this study.

All information provided will be treated in strict confidentiality and anonymity, and will not be used for any purpose other than this study.

I have read and understand the consent form. I agree to participate in this study.

Participant'ssignature_____Date:_____

Thank you for your cooperation. For more information, please contact 082 221 6133

(Ms)DimphoMolebatsi
Researcher
Date: ---------------------------
Professor A Slabbert
Supervisor

Appendix C: Questionnaire for patients

Questionnaire (Patients)
PLEASE USE A **BLACK OR BLUE PEN** WHEN COMPLETING THE QUESTIONNAIRE.
PLEASE TICK THE APPROPRIATE BOX, OR WRITE IN BLOCK CAPITAL LETTERS,
WHERE APPLICABLE.

1.   What is your gender?

    A. ☐ Female
    B. ☐ Male

2.   Please select your age range.

    A. ☐ 18–24
    B. ☐ 25–34
    C. ☐ 35–49
    D. ☐ 50–64
    E. ☐>65

3.   How often do you visit the clinic?

    A. ☐ Once a week
    B. ☐ Twice a week
    C. ☐ Once a month
    D. ☐ Once a year
    E. ☐ Other

4.   From your previous visit, how long did you wait before receiving your record/folder
(medical files)? Please choose from the range below.

    A. ☐ 1 – 30 minutes
    B. ☐ 30 minutes – 60 minutes
    C. ☐ 1 – 2 hours
    D. ☐ 2– 3 hours
    E. ☐ Other (specify) ………………

5. From your experience, and by estimation, please indicate how often the following
primary administrative problems occur. Select from the box below.

	Never	Rarely	Sometimes	Almost always	Always
Misfiling					
Missing files					

Damage to patient's folders					
Lack of support for resources (e.g. insufficient funds, stationery)					
Lack of general staff awareness about the importance of patients' records					

6.   What should be done to solve the above problems?
        Please tick as many as possible

     A. ☐ Move to electronic filing
     B. ☐ More training for staff
     C. ☐ Conduct regular awareness workshops on managing patients' information
     D. ☐ Provision of bigger buildings for patient file storage
     E. ☐ Other (specify) ………………

7.   If the institution computerises patients' records, what benefits do you envisage?

  A. ☐ Will save retrieval time
  B. ☐ Will save filing space
  C. ☐ Will save stationery (for example, toner and blank paper)
  D. ☐ Will pave a way to a paperless office
  E. ☐ Will avoid user queues for one file
  F. ☐ Other

   If 'other', specify.

8.   If the institution computerises patients' records, what is the possible impact?

     A. ☐ Lack of users' system skills
     B. ☐ System being offline
     C. ☐ System responding slowly
     D. ☐   Other

If 'other', specify.

9. Do you have any suggestions to improve the current daily process of patients' records?

_____

_____

_____

_____

_____

THANK YOU FOR YOUR ASSISTANCE.

DimphoMolebatsi

Appendix D: Questionnaire for staff members

Questionnaire (Clinic staff)

PLEASE USE A **BLACK OR BLUE PEN** WHEN COMPLETING THE QUESTIONNAIRE. PLEASE TICK THE APPROPRIATE BOX OR WRITE IN BLOCK CAPITAL LETTERS, WHERE APPLICABLE

Section A

1.   What is your gender?

    A. ☐ Female
    B. ☐ Male

2.   Please select your age range.

    A. ☐ 18–24
    B. ☐ 25–34
    C. ☐ 35–49
    D. ☐ 50–64
    E. ☐ >65

3.   What is your highest educational level?
    A. ☐ Doctorate
    B. ☐ Master's
    C. ☐ Honours/BTech
    D. ☐ Degree
    E. ☐ Diploma
    F. ☐ Matric
    G. ☐ Other (specify) ………………

4.   What is your job title (designation)?
    A. ☐ Manager
    B. ☐ Deputy manager
    C. ☐ Senior administrative officer
    D. ☐ Administrative officer
    E. ☐ Administrative clerk
    F. ☐ Other (specify) ………………

Section B

1. How many years of experience do you have in the current field of work specialisation?

    A   ☐ Less than 1 year
    B. ☐ 2 to 3 years

C. ☐ 3 to 4 years
D. ☐ 4 to 5 years
E. ☐ More than 5 years

2. Please rate the state of patient records management in your institution from 1 (very poor) to 5 (very good).

A. ☐ 1 Very poor
B. ☐ 2 Poor
C. ☐ 3 Unsure
D. ☐ 4 Good
E. ☐ 5 Very good

3. Is there any formal training (to manage patient files) offered to staff in your institution?
A. ☐ Yes
B. ☐ No

3.1 If 'yes', at which competency level was the training?

A. ☐ Basic
B. ☐ Intermediate
C. ☐ Advanced
D. ☐ Graduate course

3.2 If 'yes', what kind of training was offered?

A. ☐ In-house training by private trainer
B. ☐ In-house training by internal staff
C. ☐ External institution
D. ☐ Other

3.2.1   If in-house training was provided by internal staff in 3.2, who offered the training?

A. ☐ Manager
B. ☐ Supervisor
C. ☐ Provincial office
D. ☐ Other

If 'other', specify

4. Do you have a turnaround timeframe to retrieve patient records/folders?

    A. ☐ Yes

    B. ☐ No

        4.1 If 'yes', what is the average patient information retrieval turnaround time?

    A. ☐ 1 – 30 minutes

    B. ☐ 30 minutes – 60 minutes

    C. ☐ 1 – 2 hours

    D. ☐ 2 – 3 hours

    E. ☐ Other (specify) ………………

5. How much time do patients normally wait to get their records/folders (medical files)? Please choose from the range below.

    A. ☐ 1 to 30 minutes

    B. ☐ 30 – 60 minutes

    C. ☐ 1 – 2 hours

    D. ☐ 2 – 3 hours

    E. ☐ Other

        5.1 If more than two hours, what might be the problem?

    A. ☐ Misfiling

    B. ☐ Untidy filing

    C. ☐ Missing files

    D. ☐ High patient folder demand

    E. ☐ Staff shortage

    F. ☐ Other

If 'other', specify

---

6. Please tick the primary relevant administrative problems at your institution from the options in the box below.

	Never	Rarely	Sometimes	Almost always	Always
Misfiling					
Missing files					
Damage to patient folders					

Lack of support for resources					
Lack of general staff awareness about the importance of patient records					

7. Have you used an electronic filing system previously?

A. ☐ Yes
B. ☐ No

    7.1 If the institution computerises patient records, what benefit do you envisage?

A. ☐ Will improve retrieval time
B. ☐ Will improve filing space
C. ☐ Will save stationery (for example toner and blank paper)
D. ☐ Will pave a way to a paperless office
E. ☐ Will reduce long queues for patient file
F. ☐ Other

If 'other', specify

_____

8. If the institution computerises patient records, what is the possible impact?

A. ☐ Lack of user system skills
B. ☐ System being offline
C. ☐ System responding slowly
D. ☐ Difficult system to use
E. ☐ Lack of training
F. ☐ Other

If 'other', specify

_____

9. Do you have any suggestions to improve the current daily processing of patients' records?

_____

_____

THANK YOU FOR YOUR ASSISTANCE.

DimphoMolebatsi

Appendix E: Grammarian Certificate

GRAMMARIAN CERTIFICATE

SHAMILA SULAYMAN PROOF READING AND EDITING SERVICES

31 May 2020

Dear Sir / Madam

This confirms that I have proof read and edited the research study proposal entitled: **"THE UTILISATION OF AN ELECTRONIC FILING SYSTEM TO OPTIMISE PATIENT MANAGEMENT IN A SELECTED PUBLIC HEALTHCARE FACILITY"**, and that I have advised the candidate to make the required changes.

Thank you.

Yours faithfully

(Mrs) SHAMILA SULAYMAN

Communication Lecturer: CPUT

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Appendix F: Turnitin Report

THE UTILISATION OF AN ELECTRONIC FILING SYSTEM TO OPTIMISE PATIENT MANAGEMENT IN A SELECTED PUBLIC HEALTHCARE FACILITY