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Capacity building interventions for data capture and analysis in Ekurhuleni Health District.

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A research report submitted to the Faculty of Commerce, Law and Management, University of the Witwatersrand, in partial fulfilment of the requirement for the degree of Master of Management, specialising in monitoring and evaluation.

Declaration

I Radzilani Avhafhati Student no: 2156877, hereby declare that “Capacity building interventions for data capture and analysis in Ekurhuleni Health District” is my own unaided work that has been prepared by me and submitted to the faculty of commerce, law and management, University of the Witwatersrand, in partial fulfilment of the requirement for the degree of Master of Management specialising in monitoring and evaluation. This work has not been submitted before for any other degree at any other institution.



…… 30/06/2025 ……

Avhafhati Radzilani date

Dedication

This dissertation is dedicated to my loving and supportive family who provided encouragement during this study.; my late father, Mavhungu Wilson Radzilani Sithagu, my mother Tshavhungwe Vhulahani Radzilani and my wife NF Baloyi-Radzilani for the encouragement to complete my studies.

Acknowledgement

First and foremost, I would like to thank God for giving me life, courage, and strength to complete this study.

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To my wife Baloyi–Radzilani Ntwanano Fiona, thank you for your support, understanding, and encouragement during this thesis.

To my beautiful sons Thikundwi and Mukona Radzilani for understanding when I needed time to complete my thesis.

Ekurhuleni Health District deserves my gratitude for allowing me to conduct the study.

Finally, my thanks extend to all the data clerks who participated in the study.

Abstract

This study evaluates the effectiveness of capacity building among data clerks in Ekurhuleni health district. The study draws on human capital theory which indicates that humans acquire knowledge through training and education, and the acquired knowledge must ultimately improve or increase their skills on the job to perform better than the untrained employee. Health information systems provide data to various users and serve numerous functions, including producing information that helps decision-makers at all health system levels recognise problems and needs, make informed health policy decisions, and allocate limited resources efficiently.

This research employed an explanatory sequential mixed-method methodology. Data was collected in two phases. In phase one data was collected through a survey questionnaire and, during phase two, data was collected using a semi-structured interview.

The study found that capacity building improves the ability of data captures to capture and analyse data. Training has contributed to building the capacity of data clerks to be able to capture and analyse data in Ekurhuleni health district. However, the age of participants, level of education as well and years of experience play a significant role in conditioning the effectiveness of capacity building. There are also factors that counter the effects of capacity building that need to be addressed to enable capacity building to contribute more fully to building the capacity of data clerks. The study recommends that the training given to the data clerks be more practical than theoretical so that they will be able to apply and internalise it. HIS sub-district managers might better support data clerks, by visiting data clerks in the facility at least once a month and mentoring them in data analysis.

List of abbreviations and acronyms

AGSA	Auditor General of South Africa
AIDS	Acquired Immune Deficiency Syndrome
DHIS	District Health Information System
HAST	HIV AIDS STI TB
HPCSA	Health Professional Council of South Africa
HIS	Health Information System
HISP	Health Information Systems Program
HIV	Human Immune Virus
HR	Human Resource
ICT	Information and Communications Technology
KZN	KwaZulu Natal
NDoH	National Department of Health
NNASA	Neonatal Nurses Association of South Africa
OECD	Organisation for Economic Co-Operation and Development
PHC	Primary Health Care
PMTCT	Prevention of Mother-to-Child Transmission
RHIS	Routine health information system
SANC	South African Nursing Council
TB	Tuberculosis
WHO	World Health Organisation

Table of contents

Declaration i
Dedication ii
Acknowledgement iii
Abstract iv
List of abbreviations and acronyms v
Chapter 1 1
Orientation of the study 1
1.1 Introduction 1
1.2 Background 4
1.3 Problem statement 8
1.4 Research purpose 10
1.5 Research question 11
1.6 Conclusion 11
Chapter 2 12
Literature Review 12
2.1 Introduction 12
2.2 Theoretical framework 12
2.2.1 Human capital theory 12
2.3 Review of literature 14
2.3.1 Capacity building 14
2.3.2 Types of Capacity Building 15
2.3.2.1 Training as a type of capacity-building 16
2.3.2.2 Inservice training as a type of capacity building 19
2.3.2.3 Workshop as a type of capacity building 19
2.3.2.4 Individual benefits for capacity development 20
2.3.2.4.1 Individual performance 20
2.3.2.4.2 Individual contentment 20
2.3.2.4.3 Amplification of Skills 21
2.3.2.4.4 Career contentment 21
2.3.2.4.5 Self-empowerment and credence 21
2.3.2.4.6 Socialising and teamwork 21
2.3.2.5 Institutional benefits for capacity building 22

2.3.2.6 Factors that affect capacity building. 23
2.3.2.6.1 Age of participants 23
2.3.2.6.2 Level of education of participants 23
2.3.2.6.3 Shortages of staff 24
2.3.2.6.4 Supportive supervision 24
2.3.2.6.5 Method of capacity building 25
2.3.2.6.6 Practical sessions 26
2.3.2.6.7 Other factors affecting capacity building. 26
2.4 Conclusion 27
Chapter 3 29
Research design and methodology. 29
3.1 Introduction 29
3.2 Research Methodology 29
3.2.1 Research approach 29
3.2.1.1 Justification for using mixed methodology. 31
3.2.2 Study setting 32
3.3 Research tools and their application 33
3.3.1 Phase One: Survey questionnaire 34
3.3.1.1 Justification for using Questionnaire. 34
3.3.1.2 Sampling 35
3.3.1.3 Process of analysis 36
3.3.2 Phase Two: In-depth semi-structured interviews 37
3.3.2.1 Justification for using interviews. 38
3.3.2.2 Sampling 39
3.3.2.3 Process of analysis 39
3.4 Limitations, feasibility, and positionality 41
3.5 Measure to ensure trustworthiness. 41
3.5.1 Confirmability 41
3.5.2 Reliability 42
3.5.3 Dependability 42
3.6 Ethical consideration 42
3.6.1 Permission to conduct the study. 42
3.6.2 Informed consent 43

3.6.3 Ethical Principles 43
3.6.3.1 Autonomy 43
3.6.3.2 non-maleficence 44
3.6.3.3 Beneficence 44
3.7 Conclusion 44
Chapter 4 45
Presentation of data 45
4.1 Introduction 45
4.2 Quantitative data 45
4.2.1 Demographic data 45
4.2.2 Age of participants 46
4.2.3 Level of education of participants 46
4.2.4 Experience of participants 47
4.2.5 Data capture responsibility 48
4.2.6 Exposure to capacity building 49
4.2.7 Frequency of capacity building 49
4.2.8 Last capacity building in the sub-district 50
4.2.9 Workload of data clerks in the facility 51
4.2.10 The ability of data clerks to capture data on webDHIS. 52
4.2.11 The ability of data clerks to create favourites on webDHIS. 53
4.2.12 Computer skills of participants 54
4.2.13 Quality of training received by participants. 55
4.2.14 Participant's level of understanding of webDHIS 56
4.2.15 Participants' confidence in analysing DHIS data. 57
4.3 Qualitative data 57
4.3.1 Benefits of training 58
4.3.1.1 Improved outcomes 58
4.3.1.2 Understanding of webDHIS 59
4.3.2 Factors that affect training outcomes. 61
4.3.2.1 Mode of training 61
4.3.2.2 Frequency of training 62
4.3.2.3 Workload of participants 63
4.3.2.4 Practical experience of participants 64

4.3.3 Factors that affect data quality. 64
4.3.3.1 Completeness of source documents 64
4.3.4 Supportive supervision 66
4.3.4.1 Facility support visits. 66
4.3.4.2 Provision of feedback on data 68
4.4 Conclusion 69
Chapter 5 70
Discussion of research findings 70
5.1 Introduction 70
5.2 Conditioning factors for capacity building 70
5.2.1 Age of participants 70
5.2.2 Level of education 73
5.2.3 Years of experience 74
5.3 Effects of Capacity Building 75
5.3.1 Analysis of participants who did not receive training. 75
5.3.2 Analysis of participants who have attended training. 76
5.4 Workload of Participants 77
5.5 Completeness of source documents 79
5.6 Supportive supervision 81
5.7 Mode of capacity building 82
5.8 Identified gaps in capacity building in Ekurhuleni health district. 84
5.8.1 Supportive supervision 84
5.8.2 Mode of training 84
5.8.3 Frequency of training 85
5.8.4 Completeness of the source documents 85
5.9 Areas for improvement for capacity building in Ekurhuleni Health District 85
5.9.1 Frequent supportive supervision 86
5.9.2 Mode of training 86
5.9.3 In-service training for clinicians 86
5.9.4 In-service training for data captures 87
5.10 Conclusion 87
Chapter 6 88
Conclusion and recommendations 88

6.1 Introduction 88
6.2 Limitations 90
6.3 Recommendations 90
6.3.1 Mode of training 90
6.3.2 Frequency of training 90
6.3.3 Workload 91
6.3.4 Completeness of source documents 91
6.3.5 Supportive supervision 91
6.4 Conclusion 92
References 94
Annexures 109
Annexure 1. Survey questionnaire 109
Annexure 2: Interview guide 112

List of Figures

Figure 1.A Flow of data from health facilities to DHIS 7
Figure 4.2.1 Demographic data 45
Figure 4.2.2 Participants' age group 45
Figure 4.2.3 Level of education 46
Figure 4.2.4 Participant's year of experience 47
Figure 4.2.5 Data clerks responsibility 48
Figure 4.2.6 Exposure to capacity building 49
Figure 4.2.7 Frequency of capacity building 49
Figure 4.2.8 Last capacity building in the sub district 50
Figure 4.2.9 Participants' workload 50
Figure 4.2.10 Participant's ability to capture on webDHIS 52
Figure 4.2.11 Participants' ability to create favourites 51
Figure 4.2.12 Participant's level of computer skills 54
Figure 4.2.13 Participants rating of training received 55
Figure 4.2.14 Participants' level of understanding of webDHIS 53
Figure 4.2.15 Participants' confidence in data analysis 54

List of tables

Table 4.1 Themes emerging during data analysis 58

Chapter 1

Orientation of the study

1.1 Introduction

Each department needs to improve its performance and customer satisfaction, therefore departments need to come up with strategies that can be utilised to build capacity among employees (Farooq 2011). Capacity building serves to bridge the gap between the skills that the employee has and the desired skills that the employee wishes to acquire (Indira 2017). Capacity building is the cornerstone of ensuring that employees are able to adapt to the latest changes in their field of work (Dehnavieh et al. 2019).

As the world moves towards the 4th industrial revolution, South Africa's health information system (HIS) is moving towards a digital web-based HIS. Jakovljević (2008) describes a health information system (HIS) as a system designed for handling data, information, and knowledge in healthcare settings. It involves a coordinated effort to gather, process, report, and utilise health information and knowledge to impact policy decisions, program activities, and research. Dehnavieh et al. (2019) further indicate that HIS is crucial for generating high-quality data and enhancing the effectiveness and efficiency of health services. The HIS involves collecting, processing, reporting, and utilising information to improve management at all levels within the health system. A robust, integrated health information system in South Africa is essential for an effective national healthcare delivery system (English et al. 2011).

The data clerks who are expected to feed the system with information must be capacitated to have the skills and knowledge to manoeuvre the system. Some of the worldwide capacity-building strategies include training, workshops, and on-the-job training. Capacity building has its roots in many disciplines such as community development, public health and education, and also international aid and development (Crisp et al. 2000: 99). A problem arises, however, when employees are exposed to capacity-building programmes or interventions, but their competency does not improve as expected.

This study seeks to evaluate the effectiveness of capacity building among data clerks in Ekurhuleni health district. The study draws on human capital theory, which indicates that humans acquire knowledge through training and education, and the acquired knowledge must ultimately improve or increase their skills on the job to perform better than the untrained employee (Tan 2014: p. 412). For the department of health to receive returns from its employees, the department must invest in its employees so that employees can provide a positive outcome. The investment can be in the form of education, health or other elements of the employee that will equip them to work and earn better (Blaug 1976; Sweetland 1996: p. 341).

Human capital theory views the knowledge and skills that people acquire through education and training as capital (Nafukho et al. 2004, p. 547). In turn, this capital forms a deliberate act of investment that yields a return in the form of a better-equipped employee. When human capital resources are utilised effectively, the outcomes are profitable for the individual and the organisation (Nafukho et al. 2004, p. 546).

In South Africa, data clerks are important personnel in the HIS as they are expected to capture and verify information either daily, weekly, or monthly on an internet-based district health information system (DHIS). The DHIS is an internet-based software programme used to store aggregated health information for different health program indicators and data elements (DHIS2 2024). In the instances where data clerks lack the skills and knowledge to verify captured information, the information captured becomes unusable or untrustworthy.

Nicol et al. (2017), in a study of perceptions about using data for decision making conducted in KwaZulu Natal and Western Cape provinces, found that data clerks have challenges comprehending what has been learned at the HIS training. They also found that, even though data clerks have been trained, they still face challenges (Nicol et al., 2017). In another study of health information officers' views regarding mental health information utilisation in the Western Cape, it was also indicated that admin clerks, even when trained, still face challenges in analysing and interrogating collected data (Bimerew et al., 2015). Sub-district health information managers also noted that training received by data clerks on the HIS did not translate to the skills needed for them to understand the data elements (Bimerew et al. 2015). Nicol et al (2017) found

that data clerks' level of education was also found to influence whether or not the trainee made use of the skills acquired during the training.

In this study, research was conducted at Ekurhuleni Health District, a metro consisting of urban, peri-urban, and rural areas in Gauteng, South Africa. The study involved conducting a survey questionnaire amongst data clerks who had received training for the HIS, followed by a selection of face-to-face semi-structured interviews to understand the impact of capacity building interventions amongst data clerks in Ekurhuleni health district. A survey conducted by Mate et al. (2009) in KwaZulu Natal indicated significant flaws in the completeness and accuracy of data collection and reporting for Prevention of Mother To Child Transmission (PMTCT) service delivery, and further indicated that the national health systems depend on this data for reports and resource planning, including future financial allocations. Additionally, this data could be used to monitor system processes and outcomes to enhance performance (Mate et al. 2009). A review of studies conducted in South Africa by Roomaney et al. (2017) about health information systems found that the Auditor General of South Africa's (AGSA) information audits have highlighted data quality issues in the HIS at facility, district, and provincial levels.

Podewils et al's (2015) study of the completeness and reliability of the Tuberculosis (TB) surveillance system in Gauteng, KwaZulu Natal and Mpumalanga found that, for patients with a TB record, the completeness and reliability of information in the TB Surveillance System varied between data sources. Existing studies of Mate et al. (2009); Podewils et al. (2015) and Roomaney et al. (2017) indicate that there are challenges with the dependability and quality of health information system data, whilst other studies (Bimerew et al., 2015; Nicol et al., 2013) indicate that training towards supporting staff in the health sector has not yielded the desired outcomes.

For this study, the Ekurhuleni health district was chosen because the researcher observed that there remains a problem in ensuring dependable and quality data within the district (DHIS2 2020). The study therefore seeks to explore whether the results found in the studies by Nicol et al. (2017) and Bimerew et al. (2015) are also observable at the Ekurhuleni health district.

The research aims to add value in two ways. Firstly, it will shed light on the data clerks' lived experiences in relation to capacity building interventions in their workplace. Secondly, it will explore whether capacity building interventions have contributed to building the capacity of data clerks to capture and analyse data in Ekurhuleni health district.

1.2 Background

The DHIS is the District Health Information System. DHIS2 is a worldwide software also used in South Africa for collecting, validating, analysing, and presenting both aggregate and patient-specific statistical data at a district level, mainly suited for health information management (DHIS2 2024). It is a general tool with an open metadata model and a customizable user interface that enables users to design their information system without programming, and is a modular, web-based software built using free and open-source Java frameworks (DHIS2 2024). Health information systems provide data to various users and serve various functions, including producing information that helps decision-makers at all health system levels recognise problems and needs, make informed health policy decisions, and allocate limited resources efficiently (Dehnavieh et al. 2019).

The health information system (HIS) is an umbrella for a system that collects data from the facility level up to the international level through the World Health Organisation (WHO) (Dehnavieh et al. 2019). According to WHO (2008), a health information system provides the underpinnings for decision-making and has four key functions: data generation, compilation, analysis and synthesis, and communication and use. WHO describe an HIS as a system that collects data from the health sector and other relevant sectors, analyses the data and ensures its overall quality, relevance and timeliness, and converts data into information for health-related decision-making (WHO 2008).

HIS can be divided into two primary categories: (i) systems for managing individual data records like electronic medical and electronic health records, and (ii) systems focused on data collection for decision-making and information management, known as health management information systems (Dehnavieh et al. 2019). DHIS fall under category ii. DHIS is a regular system for monitoring health service provision in the

public health sector. DHIS is utilised in various regions globally to compile and present data at the district level (Kiwanuka, Kimaro, and Senyoni 2015). The District Health Information System (DHIS) is an example of a system designed for data collection for decision-making, also known as a health management information system (Dehnavieh et al. 2019). DHIS is a software used in HIS to collect health information from public health establishments. This study will focus on HIS concerning the district health information system.

In South Africa, the district health information system was first introduced between 1996 and 1998 as a pilot project in two districts in the Western Cape (Braa and Hedberg 2002). In 1999, the project was given to the Health Information System Program (HISP). After the 1994 election, the new government sought to standardise the health system across the Republic of South Africa. The pilot was from 1996-1998 and the second phase was from 1999-2001. In the year 2000, the National Department of Health adopted the health information system for it to be rolled out to all provinces in South Africa (Braa and Hedberg 2002).

The enactment of the National Health Act 61 of 2003 in South Africa marked a major achievement in addressing historical inequities by establishing a more standardised and equitable national healthcare system (Katuu 2016). The Act specifically mentions the "coordination of a National Health Information System" in Section 74 and outlines provincial responsibilities regarding health information in Section 75, which both aim at enhancing the health system's capabilities (Government of South Africa 2004).

The aim of the District Health Information Systems (DHIS) is to record data gathered from all public health facilities in South Africa (Dehnavieh et al. 2019). The HIS seeks to optimise resource use and enhance health service performance and community health through the use of DHIS. The system gathers, analyses, and transforms data into actionable information for health system decision-making (Dehnavieh et al. 2019). The data must be dependable, precise, and timely. However, many developing countries such as South Africa struggle to implement these procedures effectively (Garrib et al. 2008). South Africa is one of the countries that makes use of DHIS to collect health information for resource supply and decision-making.

DHIS requires a data clerk to capture information from the clinician's paper-based tick register in order to produce aggregated information regarding services offered in public

health care (Svensson et al. 2000). Prior to the introduction of universal DHIS software, no unified national standards existed for health data collection, analysis and reporting, such as minimum data sets or Data Dictionaries for data elements and indicators in South Africa (Svensson et al. 2000). Instead, provinces and vertical programs had their own uncoordinated standards. This situation led to the need to have a standard reporting system across different levels (Svensson et al. 2000). With the introduction of the HIS, the National Department of Health and the Provincial Department of Health are able to access real-time data on the web for decision-making. When a notifiable medical conditions, such as COVID-19 and Measles are reported, the response team can be dispatched to investigate promptly to respond appropriately.

Data clerks are placed in all public health institutions across South Africa. According to the Gauteng Department of Health (2021), data clerks have four main functions, including: data collection and collating of data and information, data handling, feedback and control of raw data and information, and other responsibilities as delegated. Under data collection and collating of data and information, the data clerks are expected to make sure that data from various sources in the clinic are collected and recorded daily, weekly, and monthly using appropriate reporting tools. According to the Gauteng Department of Health (2021), data clerks ensure that data is received from all sources and provide timely feedback to data reporting points in the clinic about the accuracy, completeness, and timeliness of their data. Data clerks are to collect all data according to the Provincial Department of Health and National Department of Health indicator data set using correct data collection tools and standardised definitions/validation rules. Data clerks are also expected to update and upload data reconciliations on SharePoint. Regularly, data clerks are expected to update registers in manual or electronic formats for accurate record-keeping purposes (Gauteng Department of Health 2021).

Under data handling, data clerks are expected to ensure that data is accurate, complete, and consistent (Gauteng Department of Health, 2021). Data should be reported promptly using specified formats (Tier.net, WebDHIS, or Excel) based on the data flow policy (Gauteng Department of Health, 2021). Data clerks are also expected to: perform validation checks and ensure data integrity; maintain a record of errors

encountered during the collection process and when the errors were resolved at the facility level; and discuss the data with facility staff and facility managers before sending it to the next level (Gauteng Department of Health 2021). Data clerks are to submit the data to the next level within specified deadlines as outlined in the data flow policy (Gauteng Department of Health, 2021).

Lastly, the data clerks are expected to collect data from different systems such as the primary health care (PHC) tick registers, Electronic TB register, Notifiable Medical Conditions System, Client Satisfaction Survey, DHIS, and NTSG as instructed by the Clinic Manager (Gauteng Department of Health 2021). They must create and maintain graphs of important indicators every month for presentations and reports that align with district/provincial strategic plans and local operational plans, and give monthly feedback to staff involved in data collection, through the unit manager, about the quality of the data (Gauteng Department of Health 2021).

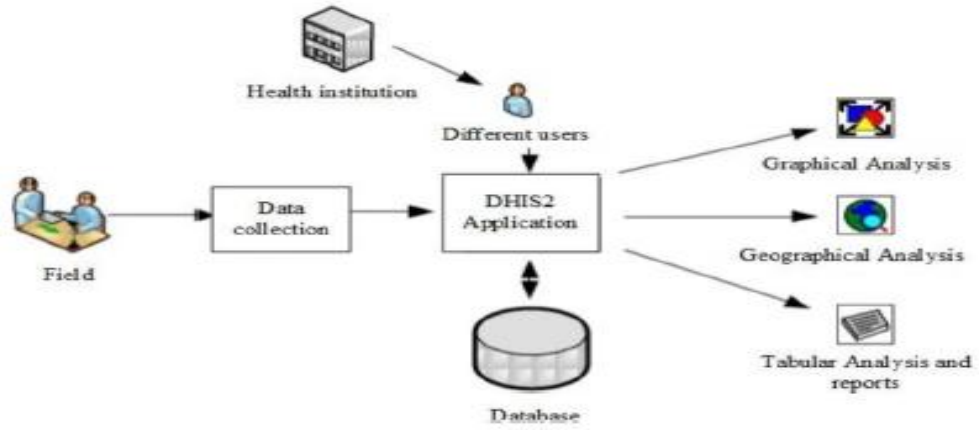


Figure 1.A Flow of data from health facilities to DHIS (Dehnavieh et al. 2019)

The diagram above shows the flow of information from the health facility to DHIS. Data clerks collect data from the various sources in the health facility and are to capture the information into DHIS. In the figure above, after fieldwork or after clients visit the health institution to receive diverse types of services, data clerks are to transfer the information into DHIS. Data clerks therefore interact with the DHIS application. In the figure above data clerks can be identified among the ‘different users.

1.3 Problem statement

Human capital has often been regarded as the secret to why some firms, organisations and departments perform better than others (Crook et al. 2011:443). There is also a shared belief that investing in human capital can yield positive individual as well as organisational level performance outcomes (Crook et al. 2011:443). However, Crook et al. (2011:443) found that regarding the specific impact of human capital on performance, it was found that out of 33 tests examining the human capital-performance relationship in the literature, only 11 (33%) confirmed a positive and significant link between human capital and firm performance.

Gibbs and Coffey (2004) have indicated that regardless of the organisation, discipline, or trade that the employees find themselves in, capacity building is a valuable tool to improve the trade of employees, ranging from cleaners to teachers. Organisations and departments invest in human capital through capacity building to be able to get the most out of their employees (Indira 2017).

Elnaga and Imran (2013) indicate that training is one of the methods to build capacity and assist employees to perform tasks better at work, developing human capital. Obisi (2011), however, indicates that, in some cases, training alone may not be sufficient. His study in Nigeria found that other conditions, such as training aids and support materials, as well as training relevance, needed to be met before capacity building, could make an impact on the employee's performance (Obisi 2011). There are therefore varying findings about the impact of capacity building. As Aragón, Jiménez, and Valle (2014) indicate that although literature generally assumes that training improves performance, this has not always been found to be the case. In a South African study conducted in KwaZulu Natal and Western Cape by Nicol et al. (2013) it was found that, when it comes to health information systems (HIS), training for data clerks has not had the desired outcomes: Although training was offered, the data clerks did not have any improvement in their performance.

A health information system (HIS) is essential for creating high-quality data and is a key component of the health system. A Health Information System integrates the gathering, processing, reporting, and use of data required to boost the effectiveness and efficiency of health services by enhancing management at every sphere of the

health system (English et al. 2011). A robust, unified information system is essential for creating an efficient national healthcare delivery in South Africa (English et al. 2011).

Since 1994, South Africa has made considerable progress in establishing and implementing a Health Information System (HIS). A notable achievement is “the development of the free and open-source District Health Information System (DHIS) for storing aggregated routine health data from various sources” (English et al. 2011:82). Nationally, there has been an increase in information management staff and HIS resources such as data collection tools, hardware, and software. The National Department of Health now receives monthly and quarterly reports based on a standardised reporting system, which has markedly improved data quality (NDoH) (English et al. 2011).

HIS is essential for generating high-quality data and serves as a key component of the health system. It coordinates the collection, processing, reporting, and use of information to improve the effectiveness and efficiency of health services by enhancing management at all levels within the health system (English et al. 2011). In 2011, the South African National Department of Health initiated a program to train 3,535 data capturers for deployment in various public health facilities to handle data entry (English et al. 2011). The course included modules on basic computer skills, DHIS, HIS and the electronic TB register.(English et al. 2011). Evidence suggests that HIS can enhance healthcare quality by boosting guideline adherence, improving disease surveillance, and reducing medication errors (Wright et al. 2017). However, challenges still exist concerning the quality and dependability of HIS data (English et al. 2011).

Adequate health information staff are needed at the sub-district, district, and provincial levels to assist facilities with data reporting and feedback (English et al. 2011). Analysing, interpreting, and presenting data in a useful format for planning and management requires technical skills. It is ideal for managers to possess these skills as well. However, “public health specialists, demographers, epidemiologists, geographic information system practitioners, and statisticians should be available for more detailed and sophisticated work” (English et al. 2011:83). Proper ICT infrastructure is necessary to provide support for HIS to ensure smooth functioning.

Additionally, English et al. (2011) find that a lack of human resources is caused by high turnover rates, poor training, and limited physical resources such as data collection tools, registers, computers, and printers.. Recently, there has also been a challenge with electricity supply with the implementation of loadshedding which is unreliable, and facilities without backup electricity are faced with interrupted electricity supply. Additionally, HIS staff roles and responsibilities lacked standardisation, and they often handle non-HIS tasks such as doing other clerical duties (English et al. 2011). There is minimal HR development planning with no clear HIS career path. Another significant challenge has been the lack of technical support from epidemiologists, statisticians, public health specialists, demographers, and GIS experts (English et al. 2011). Wright et al. (2017) also note in their study of electronic health records in South Africa that other barriers to HIS implementation included high costs, lack of necessary ICT infrastructure like computer equipment and reliable internet connectivity, and insufficient data analysis capacity in the healthcare department.

With the above conflicting findings regarding the role of capacity building in improving employee performance, the researcher will seek to find out how capacity building interventions contributed to building the capacity of data clerks at Ekurhuleni Health District.

1.4 Research purpose

The purpose of the research is to find out how capacity building interventions have contributed to building the capacity of data clerks in Ekurhuleni health district with a view to better understanding the importance of capacity building to data clerks, as well as the factors that impact effective capacity development in Ekurhuleni health district.

The aims of the study are:

- To understand how training has contributed to building the capacity of data clerks in Ekurhuleni health district to enable them to capture and analyse data.
- To identify the factors that have conditioned the effects of capacity building interventions in Ekurhuleni health district.

- To identify whether there are areas for improvement to enhance the capacity of data clerks who use the DHIS in Ekurhuleni.

1.5 Research question

How have capacity building interventions contributed to building the capacity of data clerks at Ekurhuleni Health District?

- How has training contributed to building the capacity of data clerks in Ekurhuleni Health District to enable them to capture and analyse data?
- What factors have conditioned the effects of capacity-building interventions in Ekurhuleni Health District?
- What are the areas for improvement to enhance the capacity of data clerks who use DHIS at Ekurhuleni Health District?

1.6 Conclusion

In this chapter, the researcher introduces the study discusses the problem that the researcher seeks to solve and shares the aims and purpose of the study. In the next chapter, the researcher will discuss the theoretical framework underpinning the study and share what does literature says about capacity building.

Chapter 2

Literature Review

2.1 Introduction

This chapter presents the study's theoretical framework of human capital theory. This is followed by a review of the literature concerning capacity building, including in the context of the health sector and data capture. Furthermore, the chapter discusses the link between human capital theory and capacity building, factors that affect capacity building, and the various types of capacity building that can assist in improving employees' skills.

2.2 Theoretical framework

2.2.1 Human capital theory

Human capital refers to the inherent productive abilities of individuals, which can be enhanced by investing in education, training, and health. It is considered an asset that generates services and can be measured through earnings or other output measures (Eide and Showalter 2010).

The development of human capital theory dates back to the year 1776, and its development highlights the crucial role that education can play in the community (Sweetland 1996b). Blaug, (1976) indicates that human capital theory was introduced by Theodore Schultz in 1960, although it was not until 1962 when it was published in the Journal of Political Economy. Human capital theory offers an approach to understanding personal income distribution. This theory suggests that individual income is influenced by a person's "human capital," which makes employees more productive and leads to higher income: The more an individual is educated, the more he/she must be earning, or the more an individual is educated, the higher the position he/she must attain in the organisation (Fix 2018). It is suggested that through human capital theory, improved job performance leads to higher pay as a result of increased human capital (Hayek et al. 2016). Carneiro et al (2010, p. 255) indicate that, according to human capital theory, education and training are investments that increase an

individual's productivity. This increased productivity leads to higher earnings and greater employability.

Human capital theory posits that education influences labour productivity, which in turn affects earnings. Since the 1960s, it has shaped economic and policy perspectives on the link between education and work. The prevailing belief is that intellectual development is a form of economic capital, higher education prepares individuals for employment, and educational attainment primarily determines career outcomes rather than social background (Marginson 2019). However, human capital theory is also critiqued for lacking realism due to methodological flaws: reliance on a single theoretical perspective and closed system modelling, inappropriate mathematical tools application, and multi-variable analysis of interdependent factors (Marginson 2019). It imposes a linear progression on the complex transition from diverse educational experiences to employment but fails to explain how education boosts productivity, why wage disparities have increased, or the significance of status (Marginson 2019).

The value of skills acquired in school depends on the technology used in the workplace and the overall economic environment. Numeracy and data analysis skills have become more valuable due to technological advancements. This was seen in roles like that of a data capture who is expected to capture data and analyse it. Additionally, social skills are essential now that workers often collaborate in flexible problem-solving teams (Deming 2023). Education imparts a combination of general and specific skills, and their economic worth is determined by supply and demand. Skills can be valuable or worthless depending on the context, and their scarcity or abundance varies across different economies (Deming 2023).

According to Tachibanaki (2001, p. 4186), in human capital theory, education is believed to enhance an individual's productivity and earning ability, as long as wages are aligned with productivity. Education boosts productivity by imparting skills through formal education and job training. This theory emphasises the importance of both formal and informal training in improving an individual's skill level and earning potential in the production process (Tachibanaki 2001).

Human capital theory proposes that people pursue education with the expectation of various advantages (Eide and Showalter 2010). However, most research has concentrated on the financial gains from higher earnings. Typically, this data reveals a

return rate of approximately 10% for each additional year of education, although there may be some differences based on gender and race/ethnicity. Unfortunately, these calculations overlook non-monetary benefits and personal enjoyment derived from education, as well as any wider positive effects it may have (Eide and Showalter 2010:283).

Training helps improve individual employee performance by developing job and company-specific skills, leading to greater productivity. Research shows that training has a significant impact on employee performance in the job; it was also observed in longitudinal studies and studies involving multiple levels of analysis. In addition, training and skill development opportunities have a positive influence on pay due to improved performance (Hayek et al. 2016).

Human capital theory has been chosen for this study because it centres on the role of education and learning in enhancing workers' productivity and efficiency by boosting their cognitive abilities. This capability results from both natural talents and investment in people. Formal education is viewed as an investment in human capital, and an educated population is considered productive and deemed by proponents as equally or more valuable than an investment in physical capital (Almendarez 2013). In the context of this study in Ekurhuleni Health District, human capital theory will assist the researcher in understanding the impact of capacity building interventions.

2.3 Review of literature

2.3.1 Capacity building

Naal et al., (2020) define capacity development as the development of various elements, such as knowledge, skills, commitment, structures, systems, and leadership. These elements are necessary to promote effective health and improve well-being on three levels: enhancing knowledge and skills among practitioners, strengthening support and infrastructure for health promotion within organisations, and fostering collaboration and partnerships for better community health (Naal et al. 2020).

The United Nations, (n.d.) defines capacity-building as the development and enhancement of skills, instincts, abilities, processes, and resources that organisations and communities require to survive, adapt, and flourish in a rapidly changing world.

An important aspect of capacity-building involves creating and maintaining long-term transformation from within. This transformation goes beyond simply completing tasks and involves changing mindsets and attitudes (United Nations n.d.). Capacity building enables individuals and organisations to attain development goals. Capacity building refers to the process of acquiring and enhancing the necessary skills, knowledge, resources, and tools for individuals and organisations to perform their tasks more effectively (Sujata Kumari 2022).

The OECD, (2006) defines capacity as the capability of individuals, groups, and society to handle their activities effectively. OECD, (2006) went further to indicate that capacity development is the ongoing process through which individuals, groups, and society enhance and maintain their capacity. Milèn (2001) defines capacity as the ability of individuals, organisations or systems to perform appropriate functions effectively, efficiently and sustainably. Milèn (2001) further describes capacity building as training to enhance knowledge and skills. However, many current definitions and actions related to capacity building are rooted in the fundamental principles of strategic management. Milèn (2001) further indicates that capacity building is a wide-ranging concept that includes human resource development, strategic management, change management, quality management, organizational re-engineering, knowledge management, and information management.

Capacity-building activities aim to connect the training program with the outcomes, targets, and sustainability mechanisms of the information revolution (Tilahun et al. 2021). The connection between specific areas of improvement and the overall framework can be overlooked in national and global contexts. For this study, the researcher will focus on capacity development for human resource development.

2.3.2 Types of capacity building

The training and development of human resources are crucial to ensuring high-quality education at all levels, from primary to tertiary (Abosede 2015). There are several types of capacity building, which include and are not limited to training, in-service training, workshops, and on-the-job training from peers. For this study, the researcher will focus on training and in-service training as well as workshops. All these initiatives

seek to equip an individual to better perform their tasks and to improve their skills at work.

2.3.2.1 Training as a type of capacity-building

Training is a structured process that helps people acquire knowledge and skills for a specific purpose. It involves teaching and learning activities aimed at helping members of an organisation gain the necessary abilities for a particular job. Training is about enhancing an employee's skills to perform their job effectively (Sujata Kumari 2022). Training is the knowledge and skills that workers acquire after their formal education. It is associated with a specific industry or technological skill.

Training is similar to schooling in that workers have control over how much they invest in it, but it is more complex because they often need help from their employer to make training investments (Acemoglu and Autor 2011). The company also has a responsibility to invest in employee training, as it typically bears a significant portion of the costs. This is especially important considering that training should align with the specific technologies used by the company in the future. Therefore, training is usually a joint investment between companies and workers, which makes its analysis more complicated (Acemoglu and Autor 2011).

Training has long been the most common method for capacity building, with a focus on developing skills. However, a new approach that looks for underlying reasons behind poor performance has raised doubts about the effectiveness of training alone (Milèn 2001). This approach examines not only individual knowledge gaps but also factors within the organisation and broader action environment (Milèn 2001). Training can be divided into two main types: on-the-job training and off-the-job training. Training is commonly used all over the world to enhance healthcare provider performance. Rowe et al. (2021) their study about the effectiveness of training for healthcare providers in low and middle-income countries found that educational outreach visits were generally more effective than in-service training, which was more effective than peer-to-peer training and self-study.

Farooq, (2011) in a study about the impact of training and feedback on employee performance, has identified training as one of the strategies to improve employee performance while Khan et al. (2011) in their study about organisational performance found that training improves the organisation's outcomes. When different categories

of staff are mixed into one training, training will be done to tick a box indicating that it was carried out, but trainees will not learn anything from it. Several studies, such as Farooq (2011), Ika and Donnelly (2017), Katsikas (2000), Khan et al., (2011), Shiferaw et al. (2017), and Shopo et al., (2020), all indicate that capacity development is an effective strategy towards employee growth and development and comes with positive observable outcomes. Some of the observed positive outcomes include high productivity, improved quality of the task, and a shorter turnaround time to complete tasks.

However, studies by Begum et al. (2020), Kumar et al. (2018), Moucheraud et al. (2017), and Thomas (2017) all indicate that, for training to be effective, some prerequisites must first be met, such as providing the trainee with time to practice. Aragón et al. (2014) also indicate that training must be planned and needs to be future orientated for it to be effective and to have an impact on the trainees. The other prerequisite is that training must also include system design, must be relevant for the category of staff that needs to be trained, and the data clerks must have a basic understanding of computers (Aragón et al. 2014).

Rowe et al., (2021) found that in-service training had no measurable effect on lay healthcare providers such as data clerks. In a study conducted in Bangladesh, to assess the perception and experiences of district health information systems in public health institutions by Begum et al. (2020), has found that training must be tailored for different categories of staff, and as such managers must not be trained together with data clerks as their roles and needs are not the same. In the study conducted in Kenya about malaria data indicators, by Githinji et al. (2017), it was found that the human factor plays a central role in capacity development because different people grasp information differently: some are fast learners, whereas others are slow learners and need constant reinforcement. Shiferaw et al. (2017) found that in Ethiopia there were sometimes gaps in the training provided to healthcare workers and support staff for health management information systems. As a result, there was minimal improvement in the quality of data.

Although the employees can be capacitated, as noted by Thomas (2017) in a study investigating contextual factors affecting health information system strengthening in low and middle-income countries, it was found that employees need to get the

opportunity to practice the skills learned. Kumar et al. (2018), reviewing literature for health information systems from low and middle-income countries, find that training must not only focus on imparting data analysis skills but must also focus on the system design so that the user will understand the system comprehensively. Respondents from three countries in Southern Africa think that training of all categories of staff can improve the utilisation and quality of HIS in the health sector (Kumar et al. 2018).

Shopo et al., (2020) when researching the use of HIS by clinicians also noted that training improves clinicians' engagement and understanding of their data. However, the study by Nicol et al. (2013) about human factors affecting the quality of routinely collected health data in South Africa found that even when training was conducted for data clerks, there was still a problem with data quality.

The studies by Shiferaw et al. (2017, p. 7) and Khan et al. (2011, p. 63) have found that the use of routine health information systems was impacted positively by capacity development interventions through training, regular feedback and supervision. In a study about primary health care (PHC) reengineering in KwaZulu Natal, it was found that nurses and ward-based outreach teams who received capacity development found it easy to compile the statistics compared to those who did not receive training (Tshabalala and Taylor 2018).

Nicol et al., (2017), who conducted studies in two provinces of South Africa, KwaZulu Natal, and Western Cape, found that data clerks were having a challenge comprehending what had been learned at the training for HIS as it was found that even though data clerks have been trained, they still faced challenges in capturing and analysing data. Another study by Bimerew, Adejumo, and Korpela (2015) also indicated that data clerks, even when trained, still face challenges in analysing and interrogating collected data. In a study by Bimerew et al., (2015) about health information officers' views of mental health information utilisation in Cape Town, it was found that, although data clerks received constant training about HIS, this did not translate to the skills needed for them to understand the mental health data elements. The level of education was also found to influence whether the trainee could use the skills acquired during the training (Nicol et al., 2017).

2.3.2.2 Inservice training as a type of capacity building

On-the-job training, also known as direct instruction, includes various methods such as apprenticeship, job rotation, internship, observation, mentoring, coaching, learning contracts, orientation, and acquaintanceship (Dunst, Trivette, and Deal 2011). This type of training is cost-effective and allows employees to gain multiple skills through rotation and fast learning (Dunst et al. 2011). However, Dunst et al., (2011) went further to indicate that the effectiveness of in-service training is limited in terms of exposure to external resources and facilities. In-service training is a financial investment that helps maintain the competence of healthcare workers (Dunst et al. 2011). Findings of the study by Dunst et al., (2011) show that on-site and field-based training have more advantages compared to other types of training and that enhanced field-based training is particularly beneficial for participants. Positive outcomes from in-service training are linked to active practitioner involvement occurring multiple times over a while (Dunst et al. 2011). Training provided while on the job is a valuable investment for acquiring and maintaining the necessary skills to ensure optimal public health worldwide (Bluestone et al. 2013).

2.3.2.3 Workshop as a type of capacity building

Off-site training is conducted away from the regular workplace, allowing employees to collaborate with colleagues from different organizations and access external resources. This type of training includes lectures, conferences, case studies, visual training, simulated program instructions, day releases, and short-term and long-term courses (Abosede 2015). Planning and effort are necessary for organising a workshop, and a lack of preparation or funding can cause challenges. If the workshop needs a lot of money, it is important to create a budget and secure enough funds to cover all expenses before committing to running the workshop (Fatumo, Shome, and Macintyre 2014). Workshops offer practical experience in various situations and can be successful because they meet the needs of student members and are therefore relevant and timely. Participants feel more confident in analysing course data with the help of expert facilitators. According to Fatumo et al., (2014) this type of learning is believed to be beneficial for career advancement, as participants often gain more experience than they expected from the workshop descriptions.

2.3.2.4 Individual benefits for capacity development

It is commonly believed in the literature that capacity building can produce employees who can meet human capital needs. Several thorough reviews of employee development research support the value and effectiveness of traditional formal programs in facilitating meaningful employee growth (Dachner et al. 2021). It is further indicated that workers should be proactive in improving their existing skills and acquiring new ones to meet the requirements of their current jobs, get ready for leadership positions, and make sure they remain employable when changing jobs or organizations (Dachner et al. 2021). Organizations must encourage employees to take responsibility for their own development and learning through talent management (Fatumo et al. 2014). The emphasis is on individuals continually improving their knowledge, skills, and competencies throughout their lives to enhance personal, social, and career growth (Dachner et al. 2021).

2.3.2.4.1 Individual performance

In numerous organizations globally, employee training is closely associated with enhanced work performance. An organization that possesses adequately trained and skilled human resources is likely to achieve high productivity and deliver services effectively and efficiently (Muyunda 2023). It is believed that there is a positive link between training and work performance, contributing to achieving organizational objectives. Training involves a learning process where an individual acquires the essential knowledge and skills to perform specific tasks successfully. In many companies, efficient service delivery and staff performance are commonly linked to effective training (Muyunda 2023).

2.3.2.4.2 Individual contentment

Working with companies that invest in their employees is valuable, even if the investment benefits the company largely in the long run as opposed to the immediate term. Research shows that employee training enhances a company's reliability (Muyunda 2023). A conceptual study indicates that businesses providing training and development opportunities have high employee satisfaction and low staff turnover rates. It is further indicated that training increases organizational dependability

because employees recognize their employer's commitment to their future careers (Muyunda 2023).

2.3.2.4.3 Amplification of Skills

Training programs allow employees to refine and enhance their talents. Training equips employees with essential skills for job success, whether in hard skills like communication and problem-solving, soft skills like leadership, or technical abilities. Improving these skills increases their value to the company and boosts their confidence in handling work-related tasks (Muyunda 2023). Employers can gain full cooperation from workers by addressing fundamental needs such as career advancement, job security, and through allowances therefore providing these benefits makes employees feel secure and valued, fostering loyalty and this loyalty leads to higher productivity and better performance in their roles (Muyunda 2023).

2.3.2.4.4 Career contentment

Employees feel valued and respected by their company when given training and development opportunities. These actions show the organization's dedication to progress and success. Consequently, workers experience higher job satisfaction, knowing their employers care about their personal and professional growth (Muyunda 2023). This increased satisfaction leads to greater involvement and commitment to their work.

2.3.2.4.5 Self-empowerment and credence

Training and development initiatives enhance employees' professional skills and personal growth, including time management, stress management, and interpersonal skills (Muyunda 2023). This leads to more confident and well-rounded individuals. Organizations prioritizing employee growth see increased motivation, commitment, performance, corporate loyalty, customer satisfaction, sales, and referrals (Muyunda 2023).

2.3.2.4.6 Socialising and teamwork

Training programs enhance employees' skills, career growth, job satisfaction, adaptability, productivity, and personal development. They facilitate networking and

collaboration by bringing together colleagues from different departments and external professionals (Muyunda 2023). This leads to valuable relationships, expanded professional networks, mentorship opportunities, future collaborations, higher employee engagement and retention rates, and overall organizational success (Muyunda 2023).

2.3.2.5 Institutional benefits for capacity building

The study by Haryono et al., (2020) found that both training and promotion had a positive impact on work motivation. Additionally, Haryono et al's, (2020) the study showed that all three factors - training, promotion, and work motivation - positively influenced job performance. They further found that work motivation did not play a significant role in mediating the effect of training and promotion on job performance (Haryono et al., 2020). Mampuru et al. (2024), in their study about the impact of training and development among academics, find that job promotion has a stronger direct effect on improving employee job performance compared to training. Therefore, providing job promotions to employees in this context is more effective in enhancing their job performance (Haryono et al. 2020).

Organisations benefit from capacity building in terms of performance, productivity, profitability, efficiency, effectiveness, and revenue. They also experience other benefits like improved reputation, lower employee turnover, attracting talented employees, and cost reduction (Rawashdeh and Tamimi 2019). Previous studies show that employees who acknowledge the benefits of training are more committed and motivated to participate. There is also a positive link between perceived training benefits, emotional commitment, and continued commitment (Rawashdeh and Tamimi 2019).

The benefits of capacity building have not always been those anticipated by managers, as found in the study by Hadi (2021). Examining the prioritization of technical and non-technical skills training programs for staff in hospitals in Pakistan, Hadi (2021) found that the hospital management mistakenly believed that these training programs would directly impact employee performance when in reality the outcomes differ. Despite implementing extensive training programs at Shifa Hospital Islamabad, there was no noticeable improvement in performance (Hadi 2021).

2.3.2.6 Factors that affect capacity building.

There are other factors coupled with capacity development that affect whether the employee performs at his/her full potential. According to Longhurst et al's (2019) study, in the United States of America, it was found that an employee who is having burnout, although well trained, will not perform at his/her best. Bakotić, (2016), investigating job satisfaction and organisation performance in Croatia found that the morale of the employee was more important than the experience and training provided to the employee.

Happy employees tend to perform better than disgruntled employees (Bakotić 2016:120). A better-trained employee will have higher morale than an employee who is not trained and who does not know how to tackle a task before him. Although the employee can be capacitated through capacity development, the environment in which one finds himself or herself can negatively affect the skills and knowledge gained through capacity development (Bimerew et al. 2015). Employee performance and training impact can be influenced by various factors such as stress, compassion, self-compassion, anxiety, depression, turnover intention, and job performance (Johnson, Park, and Chaudhuri 2020).

2.3.2.6.1 Age of participants

A study by Kubeck et al. (1996) on training, performance and age found that, in the US, older adults perform poorly compared to younger adults, indicating that older adults complete tasks more slowly and take longer to finish the training program. This implies that older participants may need more time to grasp the content compared to the younger participants.

2.3.2.6.2 Level of education of participants

In Tanzania, Kimaro, (2006) found that inadequate basic education, insufficient training, and a heavy workload have led to insufficient human resource capacity to support the computer-based HMIS at all levels.

Nicol et al., (2017), in their study regarding perceptions about data-informed decisions regarding PMTCT in KwaZulu Natal, found that poor data quality was also attributed to inadequate numeracy skills. They go further to indicate that, although numeracy is

crucial for data collection and analysis, most staff involved in these processes, including data capturers and clinicians were found to lack adequate numeracy expertise (Nicol et al. 2017). Another significant challenge related to expertise was that data capture personnel and support clerks were inadequately capacitated, and even after receiving training, they reportedly continued to perform their tasks incorrectly. (Nicol et al. 2017).

Nicol et al., (2017:86) further indicate that “most trainees were not even qualified to participate in the data training, and it was also found that although data validation is crucial for maintaining high-quality data, the study reveals that district and facility-level staff generally lacked the fundamental skills to perform data validation tasks”. One Facility Manager who participated in the study by Nicol contended that if she was unable to determine whether the data was accurate, no one else in the facility would be able to identify issues with it (Nicol et al. 2017).

2.3.2.6.3 Shortages of staff

In the study by Nicol et al., (2017) manager participants cited work overload and turnover as additional causes of poor data quality. Managers at various levels contended that producing accurate data was very challenging with insufficient staff and emphasised the difficulty posed by a lack of capacity and manpower in an already strained health system (Nicol et al., 2017). Managers also agreed that the most pressing issues were a shortage of staff and inadequate skills for recording and validating data across different levels. Work overload at the facility level was linked to frequent staff rotation, which managers believed impacted data quality (Nicol et al., 2017). In addition, managers complained about high staff turnover at the sub-district and facility levels, leading to training new employees, as well as the fact that data had remained uncaptured for months, since new staff did not possess the necessary skills or experience to handle HIS-related tasks (Nicol et al. 2017).

2.3.2.6.4 Supportive supervision

In a study on HIS in Ethiopia, Tilahun et al., (2021) found that Inadequate HIS infrastructure (including limited Internet access and unreliable power supply), lack of support, low staff commitment, poor data analytics skills, high turnover rates among health information technicians, and minimal use of e-health applications or

digitalisation resulted in poor data quality and low information utilisation. In another study conducted, also in Ethiopia, by Taye (2021:44) several bottlenecks were identified related to HIS capacity, including "limited staff capability in data management and utilisation"; "lack of or weak supervisory, mentoring, and monitoring systems in health facilities"; and "staff shortages".

A case study conducted in Tanzania by Neelima et al., (2024), about factors influencing data utilization and performance of health management information systems found that only 42% of health institutions reported receiving supportive inspections from district office personnel within three months prior to the study. Their case study further notes that most health institutions (53%) indicated that the regional supervisory team required a supervisory checklist during their visit. Conversely, only a small percentage (8%) of healthcare institutions had a specific timetable for district supervisory inspections and a significant portion of facilities (34%) stated that regional teams often conducted unannounced inspections (Neelima et al. 2024:150). Only 54% of participants reported giving feedback on the submission and quality of findings from the regional office to health facility staff, mainly through verbal communication (Neelima et al. 2024:151).

Supervision and feedback can also be significant concerns regarding human error and staff attitude, as observed by Nicol et al. (2017). Participants in their study contended that feedback helps staff recognize where their work requires enhancement. However, despite its importance, feedback is frequently lacking at the facility level (Nicol et al. 2017). The authors also discovered that the frequency and quality of supervisory visits were factors leading to poor-quality data (Nicol et al. 2017). A facility manager voiced concerns about inadequate supervision at the facility level, suggesting that supervisors should engage more actively in their duties instead of merely inspecting a few folders that may not accurately represent the situation at the facility (Nicol et al. 2017). Supportive supervision at the facility is of paramount importance: the different staff in the facilities find it to be valuable and require it for both good and bad feedback.

2.3.2.6.5 Method of capacity building

Nicol et al., (2017) in a study about the perceptions regarding data informed decisions in KwaZulu Natal, Eastern Cape and Western Cape provinces it was found that most participants believed that training for recording and validation was essential for

enhancing data quality, and they recommended that training adheres to adult learning principles by being interactive. Study participants favoured in-service training that is relevant, engaging, and focused on the learner (Nicol et al. 2017). However, district managers were frustrated with staff behaviour during such training sessions (Nicol et al. 2017). This implies that the type of training must be in line with the age of participants.

2.3.2.6.6 Practical sessions

Kimaro's study (2006), conducted in Tanzania, found that despite being trained, health workers lacked the time to use their new skills. This emphasis on training without adequate practice led to wasted resources and no mechanisms for sustainability. The study by Nicol et al. (2017) in KZN and the Western Cape found that most participants (data capturers) believed training for recording and validation of health data was essential for enhancing data quality and they suggested in-service training that is pertinent, engaging, and focused on the learner. However, district managers were frustrated with staff behaviour during the training sessions (Nicol et al. 2017).

2.3.2.6.7 Other factors affecting capacity building.

Tilahun et al's study (2021), in Ethiopia, found that despite improvement, data quality remained a significant issue, and the major gaps identified during the baseline assessment included poor documentation, absence of tally sheets and registers, lack of HMIS guidelines, and insufficient skills. They also indicated that where there is a lack of ownership from the staff, there will be challenges with HIS (Tilahun et al., 2021).

Rudd et al., (2019), conducting research across Tanzania and Namibia, found that health information systems (HIS) are crucial for the enhancement and fortification of global health systems: quality data is vital for disease prevention and treatment, policy creation, resource planning, and accountability. They go further to indicate that reliable, valid, timely, and relevant data require strong HIS tools and skilled personnel to manage and utilize these systems effectively (Rudd et al., 2019).

In the South African context, Mate et al., (2009) evaluated the challenges of health information systems in KwaZulu Natal, suggesting that HIS in developing countries typically fail to deliver adequate data for effective public health management. They

note that common problems revolve around system design, continuous personnel training, and data dissemination (Mate et al., 2009). In Nicol et al's (2017) study, participants (managers and subdistrict managers) were worried about the accuracy of information provided by patients, noting that patients occasionally gave incorrect details to nurses during clinic visits. This implies that although the data clerks can be trained, if the information they receive is wrong it will ultimately affect the whole system. The core problem was that inaccurate data from the source could affect the entire system up to the national level, and validation alone would not fix it (Nicol et al. 2017).

Nicol et al's (2017) findings further indicate that, although data is routinely collected in all South African public health facilities, it is rarely utilized by decision-makers. Several reasons for this underutilisation included the absence of reliable data sources, insufficient skills for interpreting and using data, and issues with the data-collection processes such as poor quality, incomplete, and untimely data (Nicol et al. 2017). The staff's attitude toward routine health information system tasks was highlighted as a barrier to collecting high-quality data (Nicol et al. 2017). Concerns were expressed about the indifferent attitudes of the staff during data collection. Participants reported that some staff deliberately avoided marking relevant data, neglected to fill in registers, and when they did complete them, they often did so incorrectly or failed to follow guidelines (Nicol et al. 2017). This shows that more emphasis is needed for staff to understand the importance of data.

Nicol et al. (2017:33) study indicated that "Human errors, including forgetfulness, absentmindedness, and carelessness related to staff attitudes, were identified as causes of poor data quality at the facility level". Facility managers reported that clinicians often fail to remember to document the care provided and sometimes recorded incorrect values (Nicol et al. 2017)

2.4 Conclusion

This chapter discussed the theoretical framework for the study, which is human capital theory, and different types of training that contribute to building capacity. From the literature review conducted, for capacity building to be effective, it must be planned for the specific category of employee, taking into consideration the level of education as

well as age. When an employee is disgruntled, the employee will not perform at his/her best. Most of the existing studies consulted by the researcher in the context of South Africa were focused on KwaZulu Natal, the Eastern Cape and the Western Cape. It can also be noted that those studies were specifically looking at data quality within the HIS.

The empirical gaps that the researcher has observed from the literature reviewed with regard to the South African public health sector is that the researchers were focusing on the data quality and not on the experiences of the data clerks. The South African public health sector is very diverse, exhibiting considerable differences in resources, infrastructure, and health needs across various provinces and districts. The majority of the studies were conducted in the Western Cape and KwaZulu-Natal, hence, context is important. The existing literature also overlooks the significance of enhancing digital literacy and skills in healthcare professionals.

In this study, the researcher will be focusing on Ekurhuleni Health District, which is a metropolitan municipality in Gauteng Province. The researcher will be seeking to understand how training has contributed to building the capacity of data clerks, as well as to identify factors that contribute to building capacity interventions in Ekurhuleni health district. The next chapter will discuss the research methodology used in this study and how data was collected and analysed.

Chapter 3

Research design and methodology.

3.1 Introduction

In this chapter, the researcher will discuss the methodology that has been used in this study, and detail how data was collected from the participants. The chapter will also provide a detailed analysis of how participants were chosen as well as how data was analysed.

3.2 Research Methodology

Kothari, (2004, p. 7) defines research methodology as the behaviours and tools used to choose and develop research techniques. This research is a mixed-method study. Data has been collected in two phases. In phase one data was collected through a survey questionnaire and, during phase two, data was collected using a semi-structured interview. The target population were data clerks working at Ekurhuleni Health District. Participants were purposively sampled to take part in the study.

3.2.1 Research approach

A mixed-method approach was used to collect qualitative and quantitative data and analysed to address different but related questions (Polit and Beck 2017:735). Gray, Grove and Sutherland (2017, p. 683) define a mixed-method approach as a research methodology in which two research designs are utilised to better represent the truth. Mixed-method research refers to studies that integrate both quantitative and qualitative research within a single investigation (Bryman, 2012) to better understand the phenomenon under study (Leavy 2017:164).

This research was based on the pragmatism paradigm that believes that human thoughts are intrinsically linked to their actions and that there are varying ways of interpreting the world; it can also be said that pragmatism is not a philosophical

position but a set of tools for addressing the problem (Shaw, Connelly, and Zecevic 2010). Pragmatism holds an ontological belief that reality can be negotiated, debated or interpreted and that knowledge can be examined by any tool deemed applicable or best suited to the question (Yvonne Feilzer 2010:8). Pragmatism seeks to bridge the gap by using a qualitative method in one aspect and complementing it with a quantitative methodology.

Pragmatism is associated with mixed-method research and provides a “basis for a stance that has been stated as the dictatorship of the research question” (Gray et al. 2017:310). The methodology is driven by the research question rather than focusing on which methodology to use and rejects the notion that the researcher must choose between the positivist and constructivist paradigm (Polit and Beck 2017). In this case, the researcher seeks to understand how training has contributed to building the capacity of data clerks in Ekurhuleni Health District to enable them to capture and analyse data. The research also seeks to identify the factors that have conditioned the effects of capacity building interventions amongst data clerks. The pragmatism method allowed the researcher to understand the research question from a quantitative as well as qualitative point of view.

The researcher employed a mixed-method research methodology to collect both quantitative and qualitative data. So that the researcher can get a richer understanding of the data, and capture lived experiences about both capacity building and data clerk’s understanding of the data elements with which they work, an understanding of human behaviour, actions, beliefs, and attitudes of the participants is required. Mixed methods research involves combining quantitative and qualitative methods in a single study. Different definitions define it as including at least one method to collect numbers and another to collect words, or as combining both approaches into the research methodology of a single study (Azorin and Cameron 2010). In mixed methods research, the researcher combines quantitative and qualitative techniques, methods, approaches, concepts, or language within a single study. It is a type of research that combines data collection and analysis from both qualitative and quantitative sources (Azorin and Cameron 2010).

3.2.1.1 Justification for using mixed methodology.

Using both quantitative and qualitative approaches together can lead to a better understanding of research problems and complex phenomena compared to using either approach alone. This is because combining the two methods allows for triangulation, which enhances the validity of inferences by comparing and confirming results from different methods (Azorin and Cameron 2010). By offsetting the weaknesses of one method with the strengths of another, mixed-method research offers advantages such as overcoming methodological limitations. Additionally, mixed-method research has other benefits including complementarity (expanding on findings from one method with those from another), development (using results from one method to inform the use of another), initiation (identifying paradoxes or contradictions that reframe research questions), and expansion (using different methods to broaden inquiry) (Azorin and Cameron 2010).

In this study, the researcher used mixed methods as a complementary. The researcher collected quantitative data first and then collected qualitative data which complemented the quantitative data. This allowed the researcher to give the data clerks a voice regarding capacity building (Warfield 2010).

Mixed methods research also allows researchers to address both confirmatory and exploratory questions simultaneously. By combining statistical analysis of quantitative data and field research, case studies, or surveys, researchers can confirm the existence of an effect on a phenomenon and explore the underlying reasons for that effect. Additionally, qualitative methodology can be used to generate theory while quantitative methods are employed to test that theory.

Pole (2007) indicates that this approach of looking at data from multiple perspectives allows for stronger inferences. By providing greater depth or breadth individually and confirming or complementing each other when combined, mixed methods research offers enhanced opportunities to answer research questions effectively and evaluate the validity of the answers obtained (Pole 2007). Mixed methods research therefore, provides researchers with valuable opportunities to enhance their understanding of

intricate issues beyond what can be achieved by solely relying on either quantitative or qualitative data (Halcomb and Hickman 2015).

The approach adopted for this study was an explanatory sequential mixed-methods approach. The explanatory sequential mixed methods approach involves two phases: collecting and analysing quantitative data first, followed by qualitative data collection based on the initial results (Creswell and Creswell 2018) . This design uses qualitative insights to explain the quantitative findings in more detail, often involving purposeful participant selection and question formulation for deeper understanding. A typical process includes gathering survey data initially and conducting interviews subsequently to clarify any unclear or unexpected outcomes from the survey (Creswell and Creswell 2018).

The researcher collected survey data and used the findings from the survey to identify participants for interviews. The survey data recorded the contact email addresses of participants as well as the facility at which they work. The researcher combined the statistical analysis from the survey data with qualitative analysis to address the research question.

3.2.2 Study setting

The study setting refers to the location or locations where data collection occurs. It involves details such as the geographical area, types of facilities, and environmental conditions present during data collection. A study setting can be an academic institution, a healthcare facility, a community centre, or even virtual spaces like online platforms (Brink, Van der Walt, and Van Rensburg 2018; Gray and Grove 2021).

In the case of this research, the study setting was the City of Ekurhuleni Health District. Ekurhuleni is a metropolitan municipality situated in Gauteng. The district is one of five in the province and has an estimated population exceeding 3.3 million people. Figure 1 below depicts the map for Ekurhuleni showing the three regions of which it is comprised: Ekurhuleni East Service Delivery Region, Ekurhuleni North Service Delivery Region, and Ekurhuleni South Service Delivery Region. There are ninety-three (93) primary healthcare facilities within the City of Ekurhuleni, with six hospitals.



Figure 1: Map for the City of Ekurhuleni showing different regions.(City of Ekurhuleni n.d.)

3.3 Research tools and their application

Data collection refers to the methodical collection of information that is important for the research's purpose and specific goals, inquiries, or hypotheses (Gray and Grove 2021:808). According to Brink, Van der Walt, and Van Rensburg (2018:133) data collection refers to the researcher's approach to answering the research question. It includes a clear explanation of how data was gathered, how the results were obtained, and why a specific method was chosen. This process creates an audit trail. The researcher collected primary data from research participants to be able to answer the research question. Data was collected in two phases using two data collection tools: a survey questionnaire and in-depth semi-structured interviews. The survey

questionnaire was conducted to inform and assist in the selection of phase two participants.

3.3.1 Phase One: Survey questionnaire

In phase one, the researcher used a self-administered survey questionnaire to collect data from participants. The researcher first sent out a link for the online survey questionnaire. After observing a low turnout, the researcher sought permission to join the three sub-district meetings where the data clerks held their monthly meetings. The researcher joined the sub-district meetings on three separate dates for the East, South and North sub-districts with a printout of the questionnaire. HIS sub-district managers allowed the researcher to distribute the questionnaire before the meeting commenced. The researcher first explained the purpose and objectives of the study to the prospective participants. This enabled the participants to make an informed decision. It also enabled the participants to answer the questions without difficulty.

HIS managers assisted the researcher in collecting the completed questionnaire forms from participants. Although the manager assisted in collecting the completed questionnaires, the survey questionnaires remained anonymous, and managers collected the forms facing down so that they did not have a view of the content. The survey was conducted anonymously; however, participants were requested to specify the name of their facility. This information would allow the researcher to make follow-ups if necessary, and assisted the researcher to identify a sample of interview participants. Participants were not asked to share their name in the survey questionnaire.

3.3.1.1 Justification for using Questionnaire.

A questionnaire is a data collection instrument with a list of questions that the participant must answer. The questions can either be open-ended or closed-ended (Bertram and Christiansen 2020). A closed-ended questionnaire is a questionnaire that has pre-determined answers that the participants must choose from. An open-ended questionnaire allows participants to answer the questions the way he/she wants. In open-ended questionnaires, the participants can express their views in contrast to

closed-ended questionnaires. The questionnaire distributed to the participants in this study was closed-ended, with three questions that required participants to write the answers. The questionnaire distributed for this research included multiple-choice and Likert scale questions, as well as some that required short text input /small narration. The questionnaire was in English only.

The researcher chose the survey questionnaire because it is an efficient method for gathering information from a large number of individuals. This type of data collection saves time and encourages the participants to provide truthful responses as it tends to make the participants feel anonymous (Bertram and Christiansen 2020). The gathered data also has a consistent structure as participants follow in the survey questions. Survey questionnaires are not without shortcomings: for example, respondents might give socially desirable answers, some questions may go unanswered (this was something experienced in this study), and there may be a low response rate (Bertram and Christiansen 2020). Nonetheless, a survey was conducive to this study and the initial low response rate to the online survey was addressed by instead distributing hard copy questionnaires at a time conducive to participants.

3.3.1.2 Sampling

Sampling is defined as “taking any portion of a population or universe as representative of that population or universe” (De Vos et al. 2011:193). A population is referred to as individuals possessing specific characteristics that the researcher is interested in (De Vos et al. 2011). The target population includes all individuals or elements that meet the criteria for sampling (Gray and Grove 2021:411). The accessible population refers to the part of the target population that the researcher can reasonably reach (Gray and Grove 2021:411). Bertram and Christiansen (2020) indicate that sampling is where the researcher decides on the setting and who to be involved in the study. In this study, the researcher is interested in data clerks working at Ekurhuleni Health District public establishments.

The method chosen to sample the required participants for this study was convenience sampling. Convenience sampling is referred to as a non-probability sampling that chooses the most readily available population to be included in the study (Brink et al.

2018). This is used in qualitative or mixed-method research to ensure a sufficient number of participants are available for better comprehension of the study (Gray and Grove 2021:420). The researcher made use of convenience sampling to sample the required number of participants. For the survey phase of the data collection, the sample was drawn from data clerks working at the Ekurhuleni Health District public health establishments. The researcher collected data from all the data clerks who attended the pre-submission meeting in each of the three sub-districts of Ekurhuleni Health District.

The sample size is referred to as the number of people who participate in a study and has an important factor in the power of analysis as well as the statistical conclusion validity (Polit and Beck 2021:802). Through the approach set out above, the researcher collected survey response data from ninety-eight data clerks working in different public health establishments across Ekurhuleni health district.

3.3.1.3 Process of analysis

Since the research required the creation of a new data collection instrument (the survey questionnaire), this was pre-tested to ensure that it would produce the results that would be required to assist in answering the research question. The questionnaire was pre-tested using sub-district HIS managers. The responses received then assisted in refining the questionnaire. The generated data from the survey questionnaire and semi-structured interviews (part of phase 2, detailed below) were stored in a password-protected file on the computer. The hard copies of the survey questionnaires were stored in a locked cupboard.

The researcher analysed the collected survey data for any errors before trying to make sense of the collected information. This was done by checking for the completeness of data and assessing for outliers. The researcher also cleaned the data for any errors found. Analysis of data involved taking the questionnaires into numbers. The researcher input the collected data into an Excel document. After inputting the data into excel, the researcher converted some of the words into numbers to be able to summarise the data into graphs. The researcher used descriptive statistics on Excel

to summarise the data. The researcher then used graphs available on Excel to make visualisations of the collected data.

This allowed the researcher to generate statistical data and analyse the data. A Descriptive statistic was used to describe and summarise data collected from the survey. Descriptive statistics enabled the researcher to summarise and describe quantitative data (Polit and Beck 2017:373). Salkind (2017, p. 602) defines descriptive statistics as “values that organise and describe the characteristics of a collection of data”. The researcher put the data into graphs for better visualisation.

3.3.2 Phase Two: In-depth semi-structured interviews

In phase two of the data collection, the researcher made use of semi-structured interviews (qualitative data) to collect rich experiences of the data capture with capacity development at Ekurhuleni Health District. The researcher completed a series of semi-structured interviews in which the researcher had a list of questions and there was a scope for the participants to raise issues that the researcher had not anticipated (Braun and Clarke 2013:78). This type of interview allowed the researcher to cover the same topics and ask the same questions of all the participants. The researcher set up appointments with the data clerks on a date and time convenient to them and used a set of questions to guide the interview.

The interview approach was chosen because it provides for in-depth data collection and allows the researcher to both understand how capacity building has impacted data clerks from their point of view and to understand any challenges that the data clerks may still face at their workplace.

The researcher first assessed data from the survey questionnaires. Using the health facility name that participants provided on their survey as well as the demographic information, the researcher identified participants for the interview. The researcher purposefully sampled participants across the board, to include participants who indicated that capacity building had contributed to building their skills; those who indicated that it had not built their skills; and those who indicated that it neither did nor did not build their skills. The researcher then went to the clinic where the participants

work with only the facility name and the target population demographic details. On arrival at the facility, the researcher first met the facility manager for an introduction and then requested permission to talk with the data clerks.

The researcher approached the data clerks and requested to make an appointment or conduct an interview with them if they were comfortable. If the participant agreed, the researcher either set an appointment or conducted an interview. The researcher asked the data clerk to sign a consent form after explaining the study to the data clerk. The researcher requested a room where the interview could take place in a conducive environment. The interviews were conducted in a private room provided by the facility manager. Where there was no room available to use for the interview, the researcher used a car for an interview to avoid distractions during the interview.

Although the data clerks were identifiable to the researcher, their names and other personal identifying information was not recorded or reported in this research report. The interviews were recorded with the participant's consent so that the interview could be transcribed to enable proper analysis.

3.3.2.1 Justification for using interviews.

Bertram and Christiansen (2020:96) describe an interview as a discussion between a researcher and a respondent, while Polit and Beck (2021:790) define it as a way to collect data by asking questions either in person or over the phone. Gray and Grove (2021:814) define an interview as a type of communication where a researcher and subject interact to gather information for a study. It can be structured or unstructured.

The interview was suited for phase two because it enabled the researcher to be present to clarify any questions. It also allowed the researcher to ask follow-up questions to get detailed information. Participants can find interviews easier because they are not required to write long responses. Interviews also provide more detailed and descriptive data compared to survey questionnaires and this allowed the researcher to gather in-depth data from a small group of twenty-one participants. Interviews can be challenging to organise and require time and money to accomplish. Participants might give socially appropriate answers and feel nervous knowing that the

interview is being recorded. The researcher could potentially have misunderstood nonverbal cues from the participants. It was, however, best suited to gathering data for this research.

3.3.2.2 Sampling

In phase two, the researcher employed a purposive sampling, which involves the researcher intentionally selecting certain individuals, groups, or objects for the sample (Bertram and Christiansen 2020:60). In this method, the researcher focuses on a particular group that is not representative of the broader population but is only indicative of itself (Bertram and Christiansen 2020). In this phase, the researcher purposively sampled data clerks based on the responses from the online survey that they shared in phase one. The researcher sampled across the range of responses to better understand how capacity building contributes to building capacity in Ekurhuleni health district. This enabled the researcher to get detailed qualitative information about data clerks' experiences of capacity development at Ekurhuleni Health District. Although participants were purposively selected for phase two, the researcher strived to ensure inclusivity of all groups: those who answered indicating that capacity building had contributed to building their skills; those that indicated that it did not build their skills; and those that were in between. The researcher used the facility name on the questionnaire to locate the participants for the phase two interview. On the survey questionnaire, participants were asked to write in the name of the facility at which they are based so that the researcher could make a follow-up if needed. The researcher, when sampling the participants, made use of the facility name as well as biographical information (such as age and gender) to identify and approach that participant for interview. The sample size of this phase was twenty-one interview participants.

3.3.2.3 Process of analysis

The researcher analysed the findings from phase two using phase one findings. Phase two findings were used to back up the findings from phase one and to offer a detailed understanding as to how capacity-building interventions have contributed to building capacity for data clerks in Ekurhuleni Health District and share insight on how capacity building can be enhanced among data clerks. The data was analysed thematically.

Thematic data analysis is a technique for identifying and interpreting patterns or themes in data, often resulting in new insights and understanding (Naeem et al. 2023).

The researcher made use of the eight steps in the coding process adapted from Creswell (2014:248) as follows:

Step 1: The researcher begins data analysis by transcribing all interviews into verbatim transcripts, and replacing participant names with pseudonyms. The researcher reads all the transcripts carefully, jotting down some of the ideas.

Step 2: The researcher repeatedly reads the transcripts and listens to the recordings to become familiar with the content, starting from the shortest interview to the longest.

Step 3: After reviewing the transcripts, the researcher created a list of topics, and coded relevant text segments. Associated topics are clustered together so that they can make themes.

Step 4: Codes are derived from participants' statements and used to categorize transcript sections. The researcher goes through all the coded information to ascertain if new codes can still emerge.

Step 5: The researcher decides on the wording for the grouped codes to make themes. The researcher linked codes with similar meanings to form a theme, as these serve as the foundation for developing a theme. Here the codes can be used as sub-themes.

Step 6: Descriptive wording is chosen for topics, forming themes, sub-themes, and codes while reducing their number by grouping related codes. In this step the researcher strives to reduce the lengthy list of codes into small manageable codes where similar codes are grouped together to make sub-themes.

Step 7: Themes and sub-themes are presented in a table format for an overview of key findings; each theme is described before further discussion with its sub-themes.

Step 8: Interpretation involves assigning meaning to themes using consulted literature, allowing recommendations based on study results.

3.4 Limitations, feasibility, and positionality

The main limitation of this study is that it was limited to a single district which means that the findings cannot be generalisable to other health districts but only to Ekurhuleni Health District. The findings and the conclusions might not be drawn to the other districts, although they may still be useful for health districts implementing similar capacity-building programmes. Twenty-one participants were interviewed using a semi-structured interview in phase two. The researcher strived to be as objective and neutral as possible. During an interview, the researcher avoided asking leading questions.

Financial implications for collecting data were reduced by collecting survey data at the pre-submission meeting in each of the three sub-districts. The research was conducted as there were no added financial implications that the researcher endured by undertaking this research project. The researcher is an HIV/AIDS, sexually transmitted infections, and Tuberculosis (HAST) coordinator in the northern sub-district of Ekurhuleni and the data clerks do not report to the researcher, although the researcher does interact with data clerks during facility visits. The researcher does not pose any threat to data clerks.

3.5 Measure to ensure trustworthiness.

3.5.1 Confirmability

Confirmability was assured through an audit trail that offered a detailed and comprehensive account of data collection and analysis, enabling any researcher to follow the research process step by step (Shenton 2004).

The participants completed the questionnaire on their own without the researcher present. The questionnaire requested the participant's email address and the facility at which they work in order for the researcher to reach out to them for an interview. The researcher wrote the participant number on the consent form to ensure that the recording was aligned with the participant. The researcher verified that the findings accurately reflected the participants' provided information by using their words from the interview transcripts.

3.5.2 Reliability

The reliability and stability of a research tool in assessing a variable ensures consistent results over time, allowing researchers to trust the data collected and make confident conclusions (Brink et al. 2018:203). The research instrument was pre-tested to ensure that it was valid, reliable, and dependable. This involved the researcher conducting a pilot study with the health and information managers in the sub-district to allow for fine-tuning of the data collection instrument.

3.5.3 Dependability

Dependability refers to the researcher's ability to explain differences in the study or why its findings differ from previous studies (Bertram and Christiansen 2020:226). The researcher ensured that the data collected represented what the participants had answered in the questionnaire. The researcher did not manipulate data to be able to provide an answer that might be beneficial to the researcher. The findings that have been found represented what the participants have shared with the researcher. The methods, design and strategies used in this research project have been detailed to ensure that another researcher can be able to follow through on how the study was conducted.

3.6 Ethical consideration

Ethics in research is defined as “a system of moral values that is concerned with the degree to which research procedures adhere to professional, legal and social obligation to study participants” (Polit and Beck 2021:785). Ethics addresses actions deemed right or wrong and is crucial in research, especially when involving human subjects (Bertram and Christiansen 2020).

3.6.1 Permission to conduct the study.

The researcher submitted the research proposal to the University of Witwatersrand Human Research Ethics Committee (Non-medical) to get ethical clearance to conduct the study. The researcher also submitted a research proposal to the Ekurhuleni Health District Research Committee to get permission to conduct the study. The researcher received ethical clearance from the Wits School of Governance Human Research

Ethics Committee (Ethical clearance number: WSG-2021-38). After receiving ethical clearance, the researcher requested permission to conduct the study from the Ekurhuleni district health research committee, and the permission was granted (ref: GP_202110_003).

After receiving permission, the researcher sent an email to the sub-district HIS manager to request an email for data clerks to send the survey questionnaire. The email included informed consent and explained the aim and objectives of the research project, why data clerks must participate, and the risks and benefits of participating in the study.

3.6.2 Informed consent

Informed consent means participants have sufficient information about the research, understand it, and voluntarily choose to participate or not (Polit and Beck 2021:137). The researcher did not coerce the participants to participate but it was out of their own will to participate. There were no implications for the participants if they decided not to participate in the study. The participants were free to quit at any point in the study. The participants were not offered a reward of any form for participating in this research. The collected data is kept safe in a password-protected file vault in the computer.

3.6.3 Ethical Principles

There are three principles of ethics which are autonomy, non-maleficence, and beneficence. These are the principles that the researcher must observe to ensure that participants or study subjects are not harmed in any way during the study (Gray and Grove 2021:810).

3.6.3.1 Autonomy

The researcher must honour the independence of all participants involved in the study. The researcher obtained informed consent from participants before their participation, ensuring that participation was voluntary and not forced (Bertram and Christiansen 2020:79). Participants had the freedom to withdraw, decline information, and seek clarification about the study's purpose. As a result, the researcher honoured participants' choice to withdraw and avoid pressuring them into participating (Brink et al. 2018:29). However, during the interview, no participant chose to withdraw. For in-

depth interview results, the participants were coded using a pseudonym (Participant 1). The researcher did not record the participant's name when recording the interview.

3.6.3.2 non-maleficence

Non-maleficence refers to avoiding harm to participants. Researchers must consider if their study might cause physical, emotional, social, or any other harm to individuals. Participants should be aware that their information will be made public and assured of the confidentiality of the data they provide. Researchers need to protect the identities of groups and individuals when sharing study results (Bertram and Christiansen 2020:80).

Only the researcher will know the names of the participants, thereby guaranteeing their anonymity. The findings from phase one were used to sample participants for phase two.

3.6.3.3 Beneficence

In order to follow this principle, the researcher must ensure the well-being of participants. Participants have the right to be safeguarded from any form of harm or discomfort, including physical, psychological, emotional, economic, social, or legal. If a research problem involves a potentially harmful intervention, it might need to be abandoned or modified to meet ethical standards. Participants were not harmed from participating in this study. The researcher ensured that there was no harm that the participants might endure for taking part in this research, and this was ensured by not asking sensitive questions.

3.7 Conclusion

In this chapter, the researcher shared a detailed overview of the approach to this research and how data was collected to answer the research question. The researcher went further to share how data was analysed for both phase one and phase two of data collection. In the next chapter, the data from each of the data collection phases is presented.

Chapter 4

Presentation of data

4.1 Introduction

This chapter presents the data collected from both phases of data collection: the survey and the interviews. The quantitative data is first presented in section 4.1 and then the qualitative data in section 4.2.

The researcher used descriptive statistics to arrange quantitative data into charts and graphs. Qualitative data is presented in themes and subthemes, drawing on the inputs and words of the participants. In the survey questionnaire, a total of 99 participants were reached: one participant refused to take part, while 98 participants answered the questionnaire. The researcher then conducted interviews with a total of 21 participants.

4.2 Quantitative data

4.2.1 Demographic data

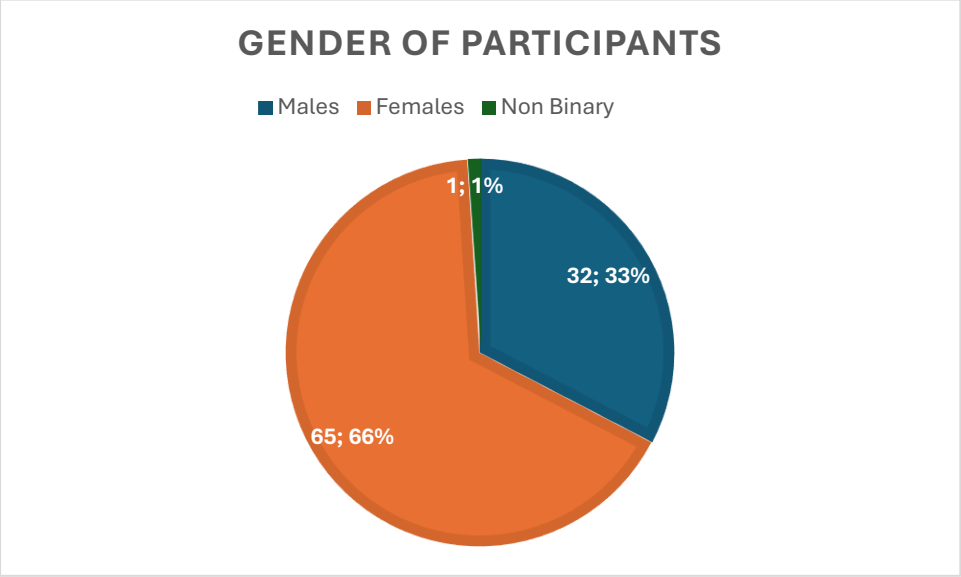


Figure 4.2.1 Demographic data

Data capturer participants were mainly females (66%). Males constituted 33% of participants. There was also 1% who did not identify as either male or female.

4.2.2 Age of participants

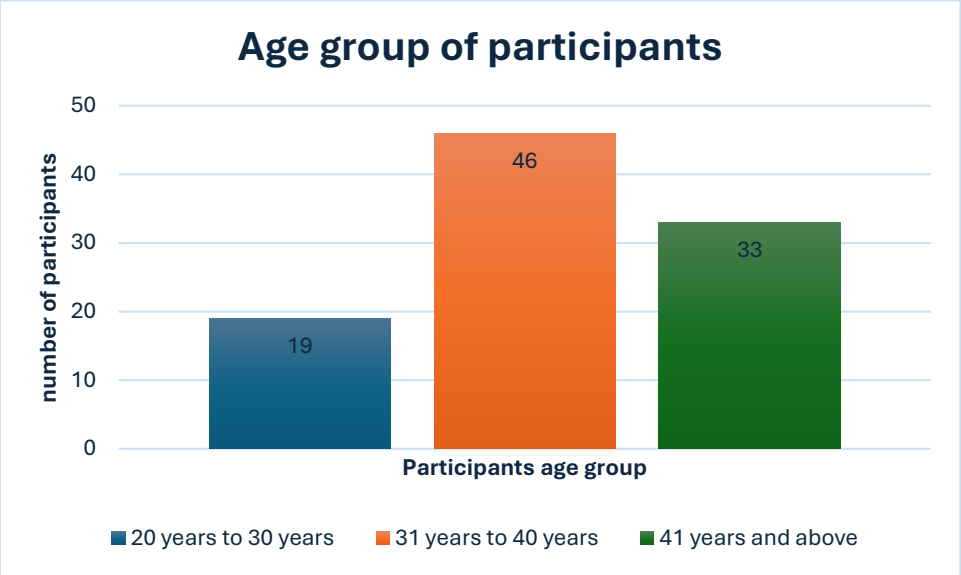


Figure 4.2.2 Participants age group

The age of participants was grouped into three age ranges: 20-30 years, 31-40 years, and 41 years and above. The majority of the participants n=46 (46,9%) fall in the 31-40 age group, followed by n=33 (33,7%) who fall in the 41 years and above age group. The smallest age group were participants of 20-30 years of age, n=19 (19,4%).

4.2.3 Level of education of participants

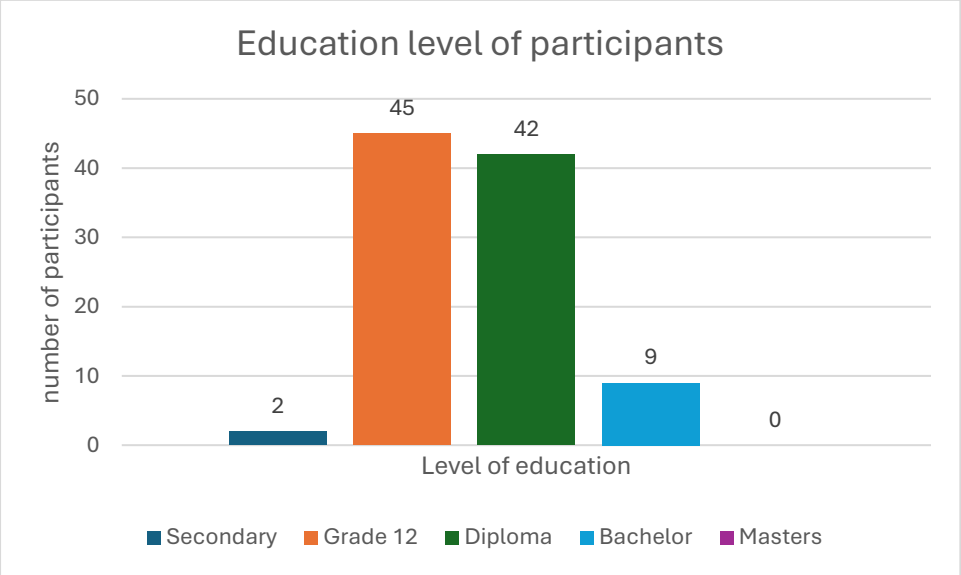


Figure 4.2.3 Level of education

The majority of participants n=45 (45,9%) had grade 12 as the highest level of education, followed by those holding a diploma n=42 (42,9%) and then a bachelor's degree n=9 (9,2%). There was also n=2 (2%) of participants with secondary education (pre-grade 12) as the highest level of education. No participant held a postgraduate qualification.

4.2.4 Experience of participants

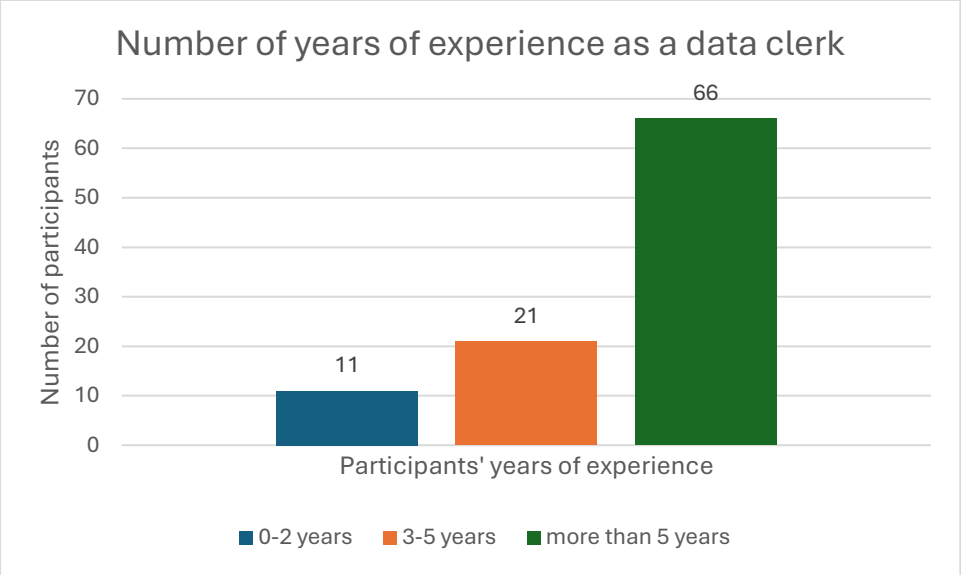


Figure 4.2.4 Participant's year of experience

The majority of participants, n=66 (67,3%) had experience of being a data clerk for more than 5 years, followed by n =21 (21,4%) with 3-5 years' experience. Only n=11 (11,2%) had 0-2 years of experience as a data clerk. Overall, the large majority of participants had several years of experience working with data. This implies that an increased number of participants have been involved with data, providing them an advantage when it comes to data capturing. The participants' years of experience were assessed to ascertain if years of experience is one of the factors that condition the effects of capacity building interventions.

4.2.5 Data capture responsibility

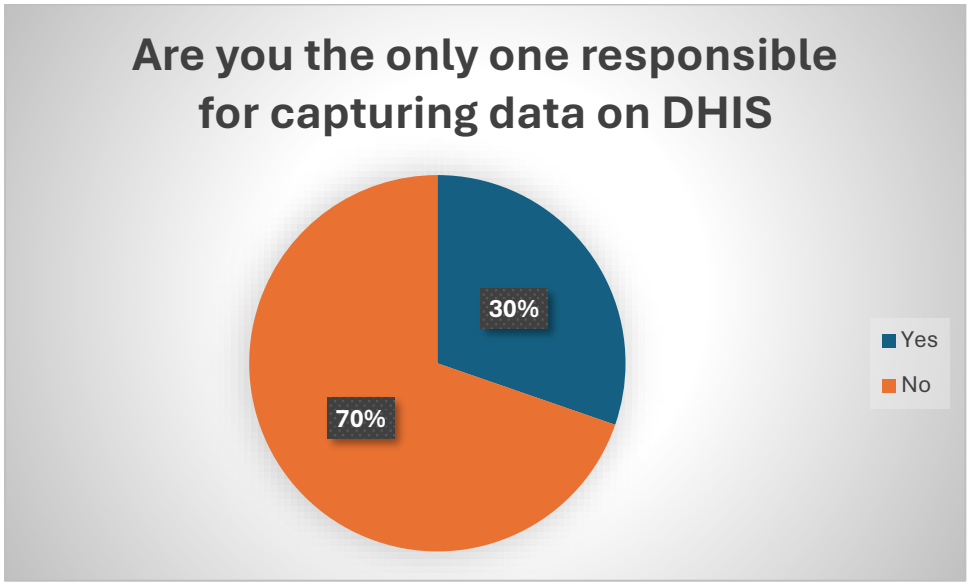


Figure 4.2.5 Data clerks' responsibility

The participants were also asked if they were the only person responsible for capturing data on DHIS. 70% (n=69) of participants indicated that they were not the only person responsible for capturing data on webDHIS, whereas 30% (n=29) of participants indicated that they were the only person responsible for capturing data on webDHIS. The majority of participants are expected to not only focus on DHIS data capturing but also do other clerical duties within the institution. Doing other duties in the facility will, in turn, increase the workload of the data clerks. Here, the researcher wanted to find out whether workload affected the capacity-building interventions in the Ekurhuleni health district.

4.2.6 Exposure to capacity building

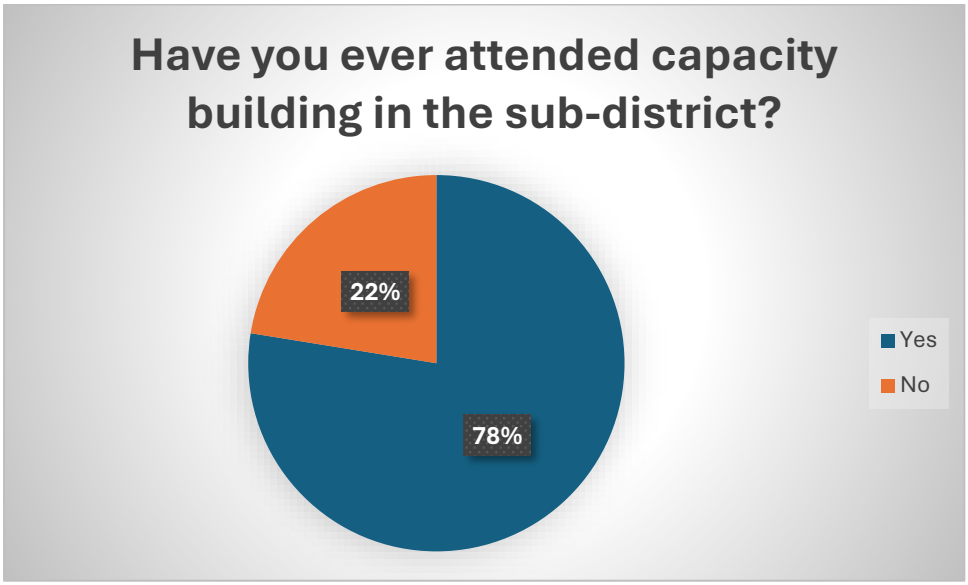


Figure 4.2.6 Exposure to capacity building

Participants were then asked if they were ever exposed to any form of capacity development regarding webDHIS in their sub-district. The majority of participants n= 76 (77,6%) indicated that they had been exposed to capacity development, with n=22 participants (22,4%) indicating that they were never exposed to any form of capacity development. The majority of participants had attended training, meaning they had an opportunity, via a capacity building process, to develop their knowledge in capturing and analysing data.

4.2.7 Frequency of capacity building

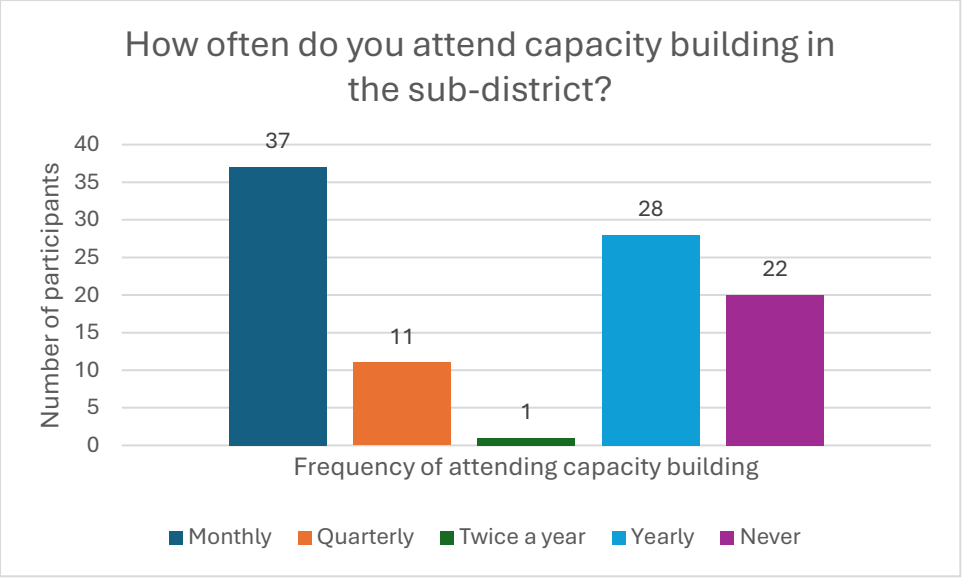


Figure 4.2.7 Frequency of capacity building

The participants were then asked how often they attend capacity building in their sub-district. The majority of the participants n=37 (37,8%) indicated that they attend capacity building monthly, followed by n=28 (28,6%) who indicated that they attended capacity building yearly.

Other participants, n=22 (22.4%) indicated they did not attend any capacity building (indicated in the chart above as 'never'). The least participants n=1 (1%) indicated twice a year attendance of capacity building, followed by n=11 (11,2%) attending quarterly capacity building. Given that 22.4% of the participants indicated that they have not attended any type of capacity building, this would suggest that there may remain gaps in skills development processes and the capacitation of data clerks with regard to DHIS. Here, the researcher aimed to assess whether the frequency of capacity building is one of the factors that affects the capacity building of data clerks in the Ekurhuleni health district. Participants experienced different frequencies of capacity building, with most (n=37) reporting that they received it monthly. Frequency is a factor that affects capacity building.

4.2.8 Last capacity building in the sub-district

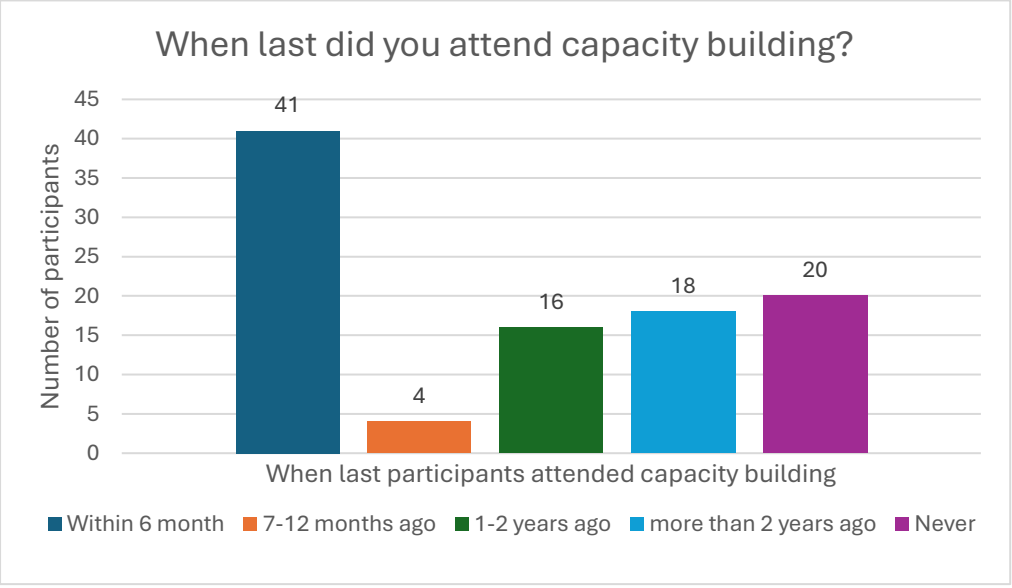


Figure 4.2.8 Last capacity building in the sub-district

Participants were then asked when they last attended any form of capacity building in their sub-district. Most participants n=41 (41,8%) indicated that they had attended capacity building within the last 6 months. This was followed by n=20 (20,4%) (never) who had not attended any form of capacity building. The other participants, n=18

(18,4%), indicated that they attended capacity building more than 2 years ago, followed closely by n=16 (16.3%) who attended capacity building 1-2 years ago. Lastly, n=4 (4.1%) attended capacity building 7-12 months ago. Given that the majority of the participants recently attended training, this should mean they have recent information regarding data capturing and analysis processes.

4.2.9 Workload of data clerks in the facility

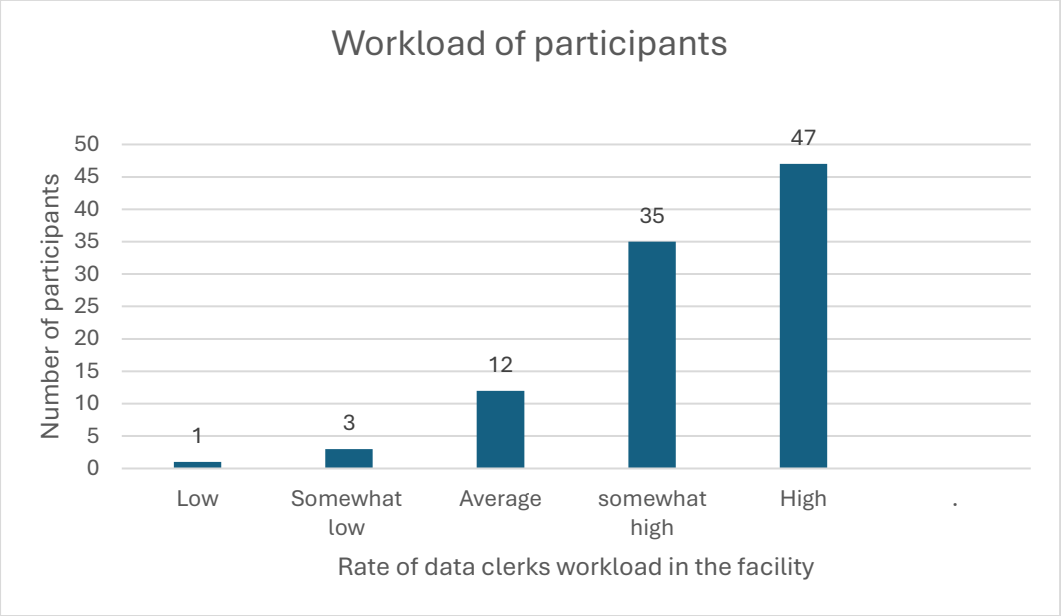


Figure 4.2.9 Participants' workload

Most of the participants, n=47 (47,9%), indicated that they have a high workload, while n=35 (35,7%) indicated that their workload was somewhat high, and n=12 (12,2%) indicated that their workload was average. In total, only 4% of participants n=4 indicated that their workload was low or somewhat low. The majority of the participants are thus experiencing a high workload in their facilities. High workload is one of the factors that negatively affect capacity development.

4.2.10 The ability of data clerks to capture data on webDHIS.

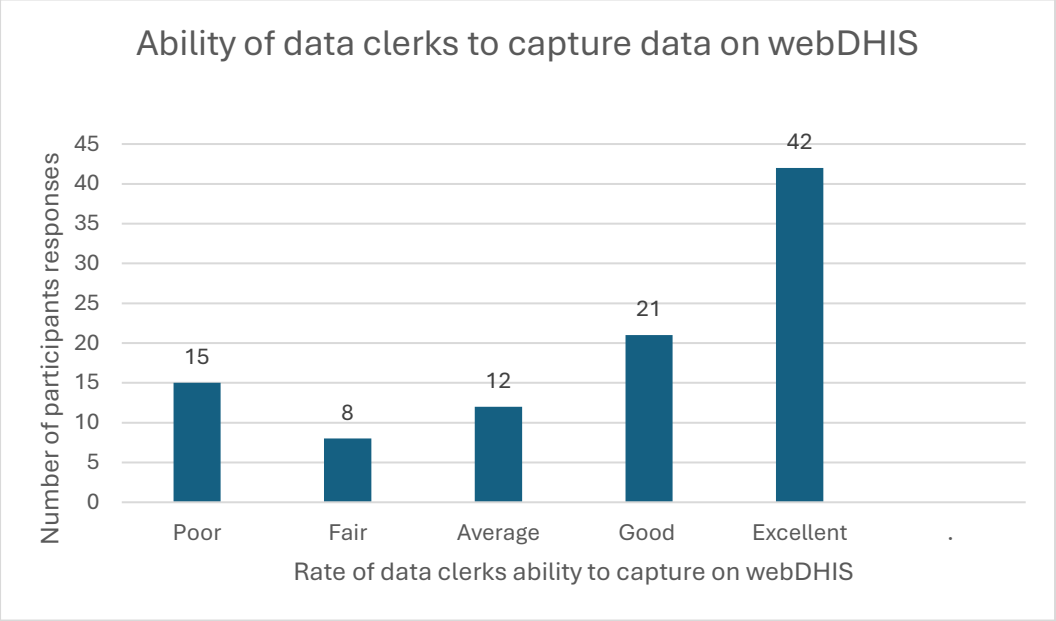


Figure 4.2.10 Participant's ability to capture data on webDHIS.

The data clerks were asked to rate their ability to capture data on webDHIS. The majority of the data clerks n=42, 42,9%) rated their ability to capture data on webDHIS as excellent, while n=21 (21,4%) rated their ability to capture on webDHIS as good. The least number of data clerks, n=8 (8,2%), rated their ability to capture on webDHIS as fair, followed by n=12 (12,2%) who rated their ability to capture on webDHIS as average. Of the participants, n=15 (15,3%) rated their ability to capture on webDHIS as poor. Although most participants indicated that they have the ability to capture data on DHIS without any challenges, responses indicate that for a number of participants, there remain challenges in terms of the ability to capture data.

4.2.11 The ability of data clerks to create favourites on webDHIS.

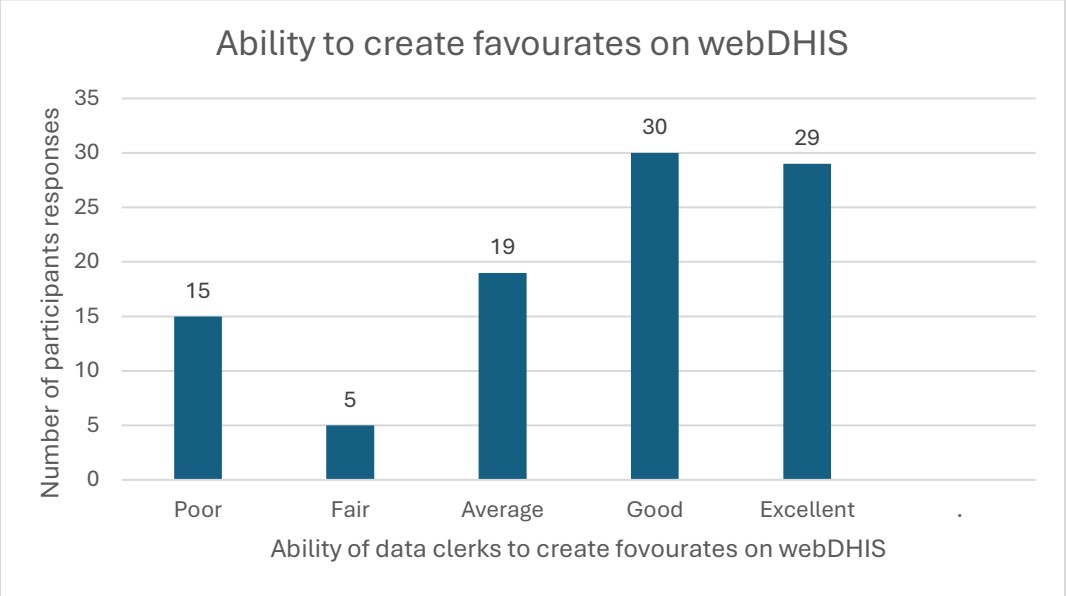


Figure 4.2.11 Participants' ability to create favourites.

The data clerks were asked to rate their ability to create favourites (a data visualiser) on webDHIS. Use of favourites, or the data visualiser, is a functionality available on DHIS where the data capture is able to reflect and assess the data they have captured. This functionality allows the data clerk to analyse data that they have captured.

The majority of participants rated their ability to create favourites on webDHIS n=30 (30,6%) as good, while n=29 (29,6%) rated their ability to create favourites as excellent. The lowest number of participants, n=5 (5,1%), rated their ability to create favourites as fair, followed by n=15 (15,3%) as poor, and n=19 (19,4%) rated their ability to create favourites as average. Although the majority of participants felt able to use the data visualiser on DHIS, 20.4% of participants rated their ability to do this as below average, suggesting further room for capacity building in this area. These findings indicate that the majority of participants (79.6%) are able to analyse data using a data visualiser on DHIS. This implies that capacity building has contributed to data clerks' ability to analyse data on DHIS.

4.2.12 Computer skills of participants

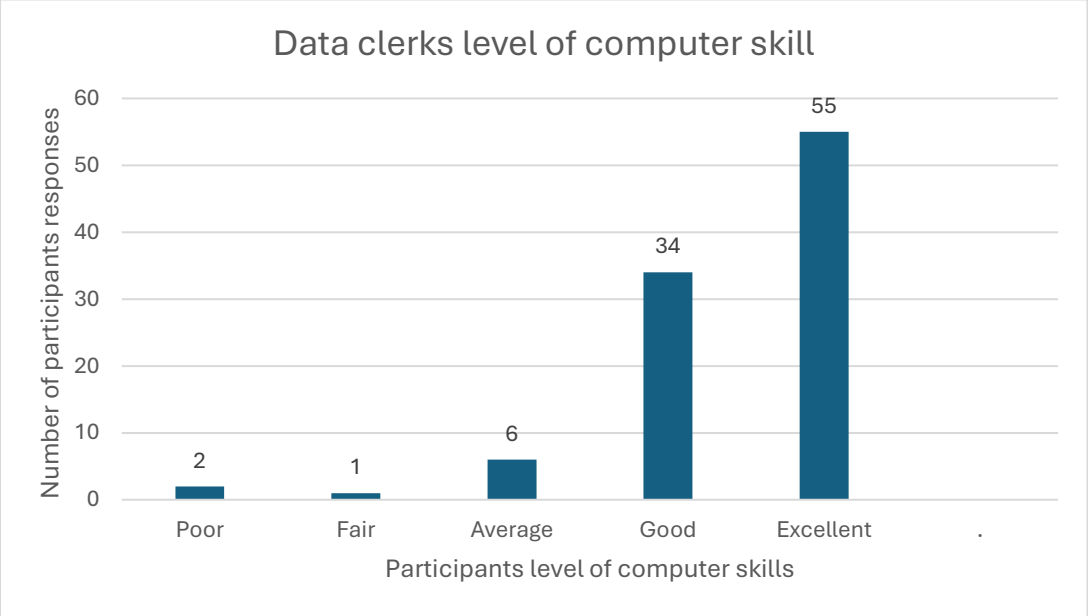


Figure 4.2.12 Participant's level of computer skills.

The participants were also asked to rate their computer skills. The majority of the participants, n=55 (56,1%), rated their computer skills as excellent, followed by n=34 (34,7%) who rated their computer skills as good. The least participants rated their computer skills as fair, n=1 (1%), followed by n=2 (2%) as poor and n=6 (6,1%) as average. Overall, participants felt that they had strong computer skills. This implies that they can engage the computer with ease in terms of the data capturing and analysis process. Here, the researcher wanted to find out if the level of computer skills is a factor that conditions the effect of capacity building, as data capturing is done with the use of a computer.

4.2.13 Quality of training received by participants.

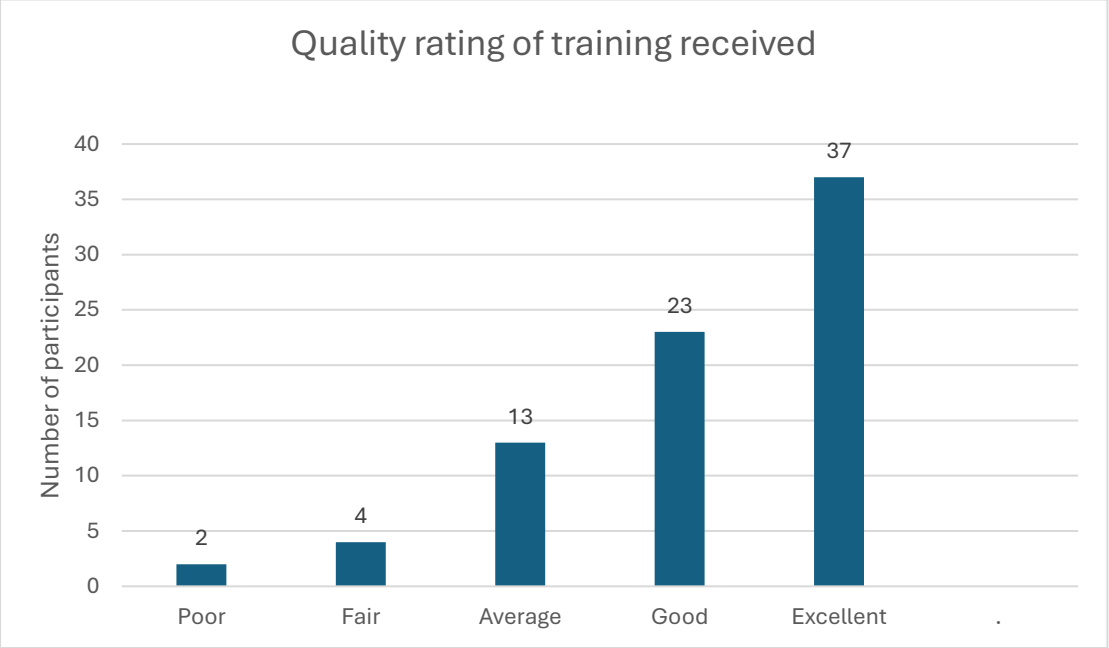


Figure 4.2.13 Participants rating of the quality of training received.

Participants were asked to rate the quality of training they received in their district or sub-district. Most participants rated the training that they received as excellent, n=37 (37.8%), followed by n=23 (23.5%) as good. The least participants rated the training received as poor, n=2 (2%), followed by n=4 (4%), and lastly n=13 (13.3%) who rated the training received as average. The overall training that the participants received, therefore, seems to have been regarded as of good quality. When training is regarded as excellent, one would assume that this has a positive impact on the capacity of data clerks.

4.2.14 Participant's level of understanding of webDHIS

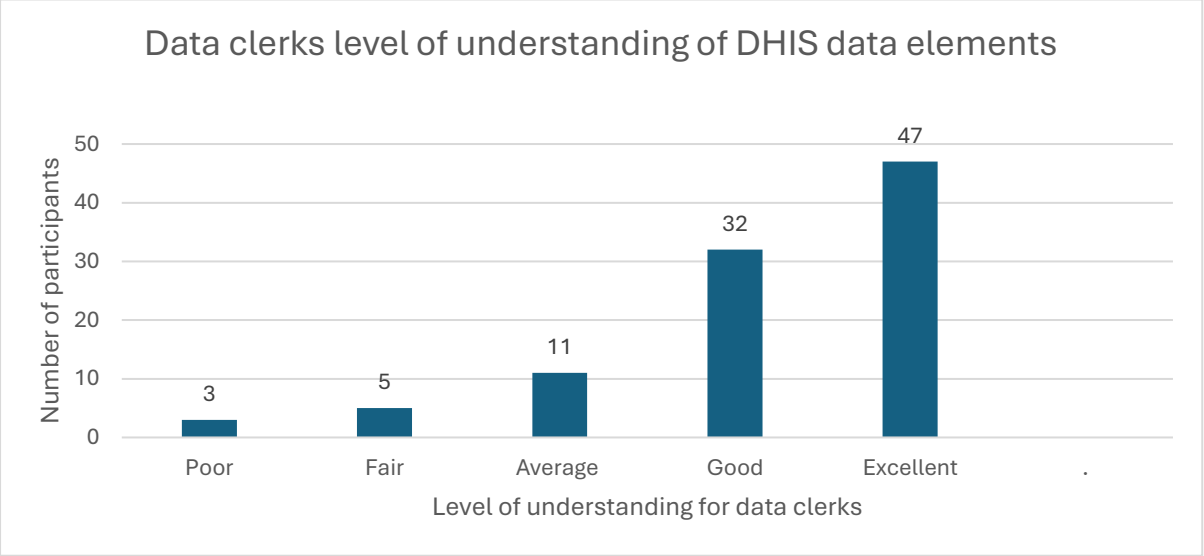


Figure 4.2.14 Participants' level of understanding of webDHIS data elements.

Participants were asked to rate their level of understanding of webDHIS data elements, ranging from poor to excellent. The majority of participants rated their level of understanding of webDHIS as excellent, n=47 (48%), followed by n=32 (32.7%) as good. The least number of participants, n=3 (3.1%), rated their understanding of webDHIS as poor, followed by n=5 (5.1%) as fair, and n=11 (11.2%) participants rated their understanding of webDHIS as average. Overall, the participants had a good understanding of the data elements, which implies that they know their meaning and also the source document used to obtain those data elements. Here from the 76 participants who indicated that they have attended capacity building in the past, only 3 participants rated their understanding of data elements as below average. This might indicate that, indeed, capacity building has contributed to building capacity in the Ekurhuleni health district.

4.2.15 Participants' confidence in analysing DHIS data.

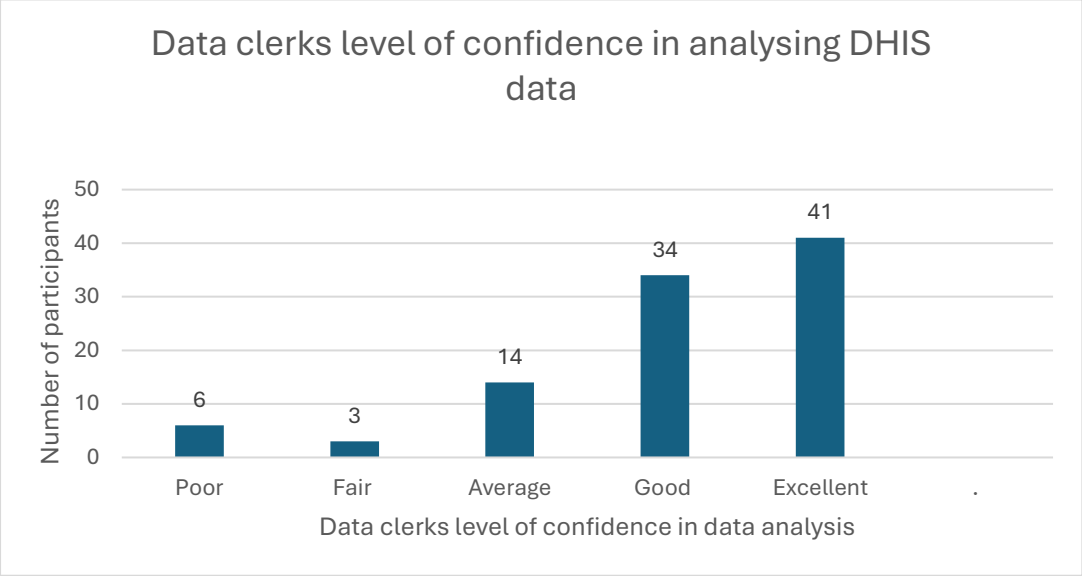


Figure 4.2.15 Participants confidence in data analysis.

Participants were asked to rate their confidence in analysing data on webDHIS. The majority of participants rated their confidence in analysing the data as excellent, n=41 (41.8%), followed by n=34 (34.7%) who rated their confidence as good. The least participants rated their confidence level in analysing data as fair n=3, (3.1%), followed by n=6 (6.1%) who rated their level of confidence in analysing data as poor and lastly, n=14 (14.3%) rated their confidence in analysing data on webDHIS as average. Overall, participants were confident in analysing the data that they captured in the facilities. This implies that they are able to analyse captured data and pick up any gaps that they might have created during capturing. Of the 76 participants who attended capacity building, only 4 participants rated their confidence level as below average. This is also an indication that capacity building has contributed to building the capacity of data clerks in the Ekurhuleni health district, as more data clerks are confident in analysing data.

4.3 Qualitative data

Qualitative data collection through interviews assisted in giving meaning to the survey data that was collected. This allowed the participants to share their experiences and offer different perspectives on the study question. The survey questionnaire provided

a positive response, and the interview provided for exploration of further factors that affect participants' work.

In some instances, the phase two data confirmed what was found in phase one, while in some instances it provided contrary findings. During data analysis of the qualitative (interview) data, the researcher came up with the themes that emerged during data analysis. The researcher listened to the interview recording and noted the common information that participants shared during the interview. The researcher then categorised the common inputs and grouped them into themes and sub-themes (indicated in Table 4.1).

The identified themes seek to answer the research question for the study.

Themes	**Sub-themes**
1. Benefits of training	Improved outcomes Understanding of webDHIS
2. Factors that affect training outcomes	Frequency of training Mode of training Participants workload
3. Factors affecting data quality	Completeness of the source documents
4. Supportive supervision	Facility support visit. Provision of data feedback

Table 4.1 Themes emerging during data analysis.

4.3.1 Benefits of training

Under this theme, the researcher observed two sub-themes which are improved outcomes and understanding of webDHIS. Participants were of the view that training has helped them to do their job efficiently.

4.3.1.1 Improved outcomes

The majority of participants indicated that training had improved their skills and ability to interact with webDHIS. However, a few suggested that training did not assist them that much. The majority of participants (76.5%) were of the view that, if it was not for training, they would not have been able to capture and analyse data on the webDHIS system. They are now better able to create favourites, which assists them in analysing data.

Participants said the following regarding training:

“.. training has helped a lot, yeah, because we didn't understand first. But like since the trainings were provided it's easier to capture. Because we understand what we do, we also understand the services.” (Participant 1)

“..*Training helps us a lot so that if ever maybe you forget something when you keep on training, training. It's also you can minimise your mistakes”* (Participant 2)

“*It made me to do my job very easily. I can manage everything without asking anyone.”* (Participant 4)

“I would not be able to understand what I'm doing at the facility. So, it does help too much.” (Participant 13*)*

“*At training, we were taught about other elements that were new”.* (Participant 6)

“It helped a lot for us to figure out what's happening.” (Participant 14)

“ …going for training when I come back, like, I'm improving” (Participant 10)

“*Even with the textbooks that they gave me, it would have taken more time than what they were doing there by their verbal lessons and stuff, not just giving me a book. So, they do a good job.”* (Participant 14)

“It was fine and understandable, cause some of the things I was not familiar with. But I get to know everything after that training. After that training, there was a huge improvement in me”. (Participant 18)

“So, the training helped me a lot.” (Participant 21)

What the participants indicated above is a testament that indeed, capacity building has contributed to building the capacity of data clerks in the Ekurhuleni health district, and data clerks are more able to do things they were not able to do before undergoing capacity development.

4.3.1.2 Understanding of webDHIS

Participants indicated that the training they have received or participated in has improved their understanding of the webDHIS. The data from in phase 1 (the survey) suggested that 92% of participants understand webDHIS and can analyse data on the

system, with only 8% having challenges. The interview participants' findings, however, painted a different picture with regard to participants' understanding of DHIS, indicating that there is still a gap in participants' understanding of DHIS. Of the 21 interview participants, five (23.8%) indicated that they had challenges. This implies that there is a small proportion of participants indicating that the confidence is not as high as the survey had indicated with regard to creating favourites to analyse data.

A participant said the following regarding understanding of webDHIS:

"*DHIS is very broad, and we only understand basics. So even if I'm asked to do certain things, I guess I won't be able to do certain things unless I'm instructed through a phone, do this and that, press here and there. That is when I will be able to understand." (Participant 13)*

The following participants indicated that they are still battling to understand and analyse data on webDHIS:

"*There are some other things that I'm I'm still learning, so I wouldn't say I am confident to that point because there are still other few things that I'm still learning"* (Participant 20)

"*I think I must attend training more often for me to understand. I make mistakes cause I don't understand the data that much…"* (Participant 10)

"*There are reports of which maybe some of them we don't even know how to do them."* (Participant 21)

"My data capture colleagues are not well equipped with capturing because they do a lot of mistakes." (Participant 2)

"Capturing is easy, the challenge is with analysis at the end of the month" (Participant 1)

This data tells us that some participants still find it challenging to understand and analyse data on DHIS, contrary to how they answered in the survey questionnaire. Three of the interview participants provided an answer in the interview that was contrary to how they had answered in the survey questionnaire. In the interview, they indicated that they experienced challenges in data analysis, whereas in the survey, they indicated that they were confident. Participant 1 indicated that when it comes to

capturing, he finds it easy, but the challenge is when he has to analyse data at the end of the month. This indicates that more effort may need to be directed towards imparting skills to enable data clerks to analyse data.

4.3.2 Factors that affect training outcomes.

Several factors affect the outcomes of the training that the participants have received. Under this theme, the researcher identified four (4) sub-themes: frequency of training, mode of training, practice, and workload.

4.3.2.1 Mode of training

How training was delivered was found to have an impact on the training outcomes. Participants indicated that, before training can be implemented, there must be a needs analysis to find out where there is a gap in data clerks' knowledge or skills, and to focus on that gap. For example, one participant remarked: "*I think they need to check where we are lacking and concentrate on that topic."* (Participant 7)

Other participants indicated that the mode of training they prefer is practical training, where they learn by doing and are able to internalise the skills.

Participants said the following regarding the mode of training:

"*I think if there is a new system starting, they need to train us manually not visually. They must never, ever give us training on visual"* (Participant 12)

"*Train without computers you sometimes you forget, so at least, when you're doing it practically, when you go back to the facility then you remember; you would see I clicked here the last time I was in the training zone."* (Participant 19)

"*I actually prefer practical training. I think it's better that way because I actually learn from doing it straight now, than theory. So, I would prefer that the training that we do in practice. Then I can think when I come back to the facility, I think it will be more effective, but I know how to do it right here."* (Participant 20)

The participants above indicated that they prefer practical training. The training that they received was more of a theory session than a practical session.

By contrast, one participant indicated a preference for a short online training, brief and straight to the point.

"*Online training for a short time, maybe 30 minutes or so, show you whatever needs to show you, and then that will be all."* (Participant 11)

Data here tells us that training needs to lean towards practical sessions to improve outcomes. Before training can be done, there must be an analysis of the gaps that the training seeks to address, and it must be a practical session rather than a theoretical session. When more practical training is conducted, the participants are able to practice and to refine their capturing and analysis skills. The mode of training was therefore identified as a factor that conditions the effects of capacity building.

4.3.2.2 Frequency of training

The majority of the participants indicated that they attend monthly meetings which they refer to as training. The frequency of the training also affects the outcomes of the training. Some participants indicated that they need more frequent training in their sub-district:

"…*if it's done on a monthly basis so that when we have problems, we can raise them*..." (Participant 2)

"*I think they have to train or do refresher training every three months."* (Participant 7)

"*Attending more training like doing more training every month, like more often, that will help me to understand data."* (Participant 10)

"…training is like maybe in a year, but better twice a year, twice." (Participant 15)

One participant wished to receive training before new data elements can be implemented: "*They must put training first before everything, because before they can implement everything, they must train us first."* (Participant 18). This implies that, at times, new data elements are implemented without data capturers being trained in advance.

One participant who, at the moment is only receiving training once a year and wishes that training could be conducted at least twice a year: " …*At training on an annual basis just for yearly care. Because sometimes we forget."* (Participant 19).

Another remarked: "*Increase the time of training. Not like to be trained once"* (Participant 3)

Participants shared different views regarding the frequency of training that they require, their views ranged from monthly training to once-a-year training that must be offered to them, with a participant saying that more time must be allocated for training to be effective. Participants indicated that they want to receive training more frequently than is currently the case. This will empower them to fulfil their tasks by being reminded of how to do certain things. The frequency of training is also one of the conditioning factors that contribute to building the capacity of data clerks. The more the participants receive training, the more they will be able to internalise the content.

4.3.2.3 Workload of participants

The workload of the participants affects how they carry out their day-to-day duties. The majority of the participants indicated that they are not only responsible for capturing data but are expected to do other clerical duties as well.

Some of the participants indicated that they were the only ones expected to do webDHIS duties, impacting their workload. This is what the participants said regarding workload:

“They must be capacitated. With the job, some of them, they don't. That's why I'm having a high workload.” (Participant 2)

“So, the workload when you are alone is. It's too much”. (Participant 4)

“*The workload is heavy, it's heavy. But then since I'm saying that I've worked for a long time. In this place. I've learned to work with the pressure. It doesn't overwhelm me.”* (Participant 14)

“I am overwhelmed because I am counting too many registers, too many registers so the health information officer supervisor must come and support us.” (Participant 15).

Data here tell us that participants are experiencing high workload in their facilities, but some are learning to work under pressure, while some are able to assist each other to relieve the workload. Participant 15 indicated that counting too many registers is overwhelming and requires someone to come and support them. The high workload might affect the quality of data, as participant 15 indicates that they are expected to count many registers, and it might happen that they miss one. If they end up missing one register, the statistics of the clinic will be skewed. As a result, high workload for

some participants negatively affects the ability of data clerks to capture and analyse data on DHIS.

4.3.2.4 Practical experience of participants

When a participant has more years of experience capturing data, the data clerk ends up developing strategies to manage the workload and the pressure that comes with the job. When one has more years of experience, one will know how to manoeuvre the system better than someone without experience. In this study, it was found that 60% of the participants who had experience of more than 5 years and were not trained on DHIS rated their confidence level to capture and analyse data on DHIS as higher than average. This is an indication that experience had assisted the participants in understanding the system.

One participant remarked, *"The thing is, I have been here for a long time ago. I've been able like, over years, work well with these things, been able to work well with the pressure" (Participant 14)*

4.3.3 Factors that affect data quality.

Although the study wanted to understand factors that affect capacity building, the data clerks shared a pivotal factor that affects the quality of data. Although they can be capacitated, there are also external factors that affect the quality of data. Data quality is a team effort, and all parties involved need to play their part.

Under this theme, the researcher identified a subtheme related to the completeness of the source documents. The challenge of completeness of the source document was raised both by participants who indicated that they were able to analyse data, and by those that had challenges with data analysis.

4.3.3.1 Completeness of source documents

Data clerks are expected to collect data from source documents, which might be the tick register that clinicians use or other registers in the facility, and input them into the DHIS. If the source documents have gaps, this will also translate to gaps in the system. As the saying goes, garbage in, garbage out.

Of the 21 Interview participants, 4 participants indicated that if the source documents that they use to capture data are incomplete, they experience challenges in capturing

data into the DHIS. In these cases, they have to go to clinicians and ask them to complete or fix the gaps. When the clinician who was using the register is off, this will cause data quality challenges.

Participants said the following with regard to the completeness of the source documents:

"*The only person that knows the importance of the ticks* [referring to the tick that the clinicians must tick on the register for collecting daily statistics of patients seen by the clinician] *it's me and me alone. The nurses think their job is to say, 'next patient' "* (Participant 11).

"*Yes, they are rendering the services, but they don't tick. …So, they will tick the 1st element, and the second one they won't tick"* (Participant 7)

Participant 7 further indicated that "*they do train us, but they don't. They don't train the clinician"* (Participant 7)

"….ask them to tick where they supposed to tick, others they don't even write the dates..." (Participant 16)

"*Nurses make mistakes, and you have to go back and ask, please fix here. Numbers are not equal from the system and your book. That's the challenge that we have."* (Participant 18)

"*Clinicians would most of the time make mistakes, but it's not all of them. So, I think they need to be reminded on how to Tick and also how to write on the files because we would get mistakes every now and then and when we go and remind them I think they don't understand the importance of doing the right thing for us to be able to capture the correct thing."* (Participant 19)

Participants shared their frustrations with regard to the incompleteness of the registers, which impacts the work of data capture. Participants view clinicians as not having a high regard for quality data. It can be said that clinicians do not understand the importance of ensuring that the source documents are complete. This affects the data capture function of capturing and analysing the statistics.

Participants were also of the view that clinicians do not realise that their own incompletion of the source documents has an impact on facility statistics. The issue of

participants having to always go to the clinicians to remind them to tick the relevant fields also increases the workload of the participants. At the end of the day, data capture involves capturing what they see. If it is not documented, it will mean it was not done. Although the data clerks can be trained, if the source documents are incomplete, they will end up capturing what they see.

4.3.4 Supportive supervision

Post-training, the data clerks in the facilities need to be supported and checked upon if they are practising the correct things. They also need to be mentored post-training to be able to correct any deviation that they might be practising. The research identified two (2) sub-themes in relation to this: facility support visits and the provision of feedback on data.

4.3.4.1 Facility support visits.

Participants indicated that, post-training, facility support is important, and allows the supervisor the opportunity to mentor and clarify any misunderstanding that the data clerks might have. The participants indicated that they require frequent support visits in their facilities to allow them to ask questions and correct any errors promptly.

Participants said the following regarding support visits:

“ *..So, they need to check data maybe weekly, every week, and call me what happened? Are you aware of why is this happening? Are you aware why? Why this, so that I can be able and answer before the final? if there's someone who's supporting me, checking my work every day, that person will make sure what I'm reporting is accurate because he checks on me, maybe weekly or after two weeks, you know.”* (Participant 7)

Participants also indicated that the supervisor needs to have a schedule that they use to visit their facility and be proactive, unlike waiting to be called when there is a problem.

Participants said the following regarding the need for frequent support visits:

"*In training service refresher like you do in the facility, maybe that person who's supporting us, we have to agree with him or her to come. Maybe after a month or just to check whether are we still on track."* (Participant 7)

"We [data captures] are overwhelmed because they are counting too many registers so they [health information officer supervisor] must come and support us." (Participant 15)

"Our *managers, not the facility manager, our managers, they must come and give us the support."* (Participant 16)

"*… most of the time when you need someone to help you, there's no one to help you. Hence, I told you. Would have to call other people other data capturers that know better than you. So, I'm the one who was supposed to seek help for others, from other facilities because when you call people that are above us, they don't pitch."* (Participant 21)

"[we need] *frequent communication by always visiting the facility, and doing some routine checks on the 1st so that we can, if ever maybe I forget something, then I can ask."* (Participant 2)

"Health information officer supervisor must come over to the clinics just to check our challenges every month to come for us and know how to assist us because my manager called them to come and assist us with something. They don't come," (Participant 4)

Although the supervisor might be visiting the facility, they need to spend quality time with the data clerks. They need to invest their time to support the data clerks in their facilities. Some data clerks indicated that they do receive support visits, but supervisors don't spend enough time with them to assist with the challenges they might be having.

One participant said the following regarding quality time with their supervisor.

"*And another challenge is if they come, they will stay 20 minutes. And they'll tell you that they're going to another clinic."* (Participant 4)

Regarding support visits, participants are indicating that they are in need of supervisors to offer support and to remind them how to do certain things or functions

with which they are facing challenges. They require supervisors to spend quality time with them and to check on them frequently. When the supervisor visits the facility, they will guide the data clerk on how to analyse data that they have captured, and how to detect data quality issues. Supportive supervision can enhance the ability of data clerks to analyse data using a data visualiser through guidance from the supervisor. Supportive supervision is also one of the factors that can positively condition the effects of capacity building interventions in Ekurhuleni health district.

4.3.4.2 Provision of feedback on data

According to DHMS policy, facilities must be provided with feedback regarding the data they are producing. Participants also highlighted that they need feedback regarding the data they produce. They indicated that if they are receiving frequent feedback from their supervisor, they will be able to correct any errors that they might have overlooked. This will improve the quality of data.

Participants said the following regarding feedback from their supervisor:

"If there's someone who's supporting me, checking my work every day, that person will be sure what I'm reporting is accurate because of his checking on me, maybe weekly or after two weeks, you know." (Participant 7)

"…After training, maybe you receive like support and we have people who support us to say this is how you do this, please fix this." (Participant 8)

"*They should tell us if there's something on the DHIS that we need to check out."* (Participant 19)

"… because we're using WhatsApp groups most of the time, maybe they send messages and say, 'fix there' or 'can you please send us 123' ". (Participant 21)

Participants indicated that they need their supervisor to frequently check on the data that they capture. When they get frequent feedback, it will ensure that they don't make the same mistake every time. Frequent feedback will also ensure that mistakes are corrected promptly before the end of the month or before data leaves the facility to the district level. This feedback and support would have the impact of improving data quality. Feedback can keep data clerks on their toes when they know that someone is

watching their data. Thus, this is also one of the factors that conditions the effect of capacity building.

4.4 Conclusion

In this chapter, the researcher presented the findings of the study. The findings presented were for both phase one survey data collection and phase two, interview data collection. Phase one findings have been presented using graphs. In the next chapter, the researcher will then discuss the findings for both phases of data collection, comparing them with the available literature, to address the research questions.

Chapter 5

Discussion of research findings

5.1 Introduction

In this chapter, the researcher will analyse the data from phases one and two and present the findings of the study, linking this with the existing literature where appropriate. The chapter seeks to answer the main research question, how have capacity building interventions contributed to building the capacity of data clerks at Ekurhuleni Health District? The other research questions that the chapter addresses include: How has training contributed to building the capacity of data clerks in Ekurhuleni Health District to enable them to capture and analyse data? What factors have conditioned the effects of capacity-building interventions in Ekurhuleni Health District? And, lastly, what are the areas of improvement to enhance the capacity of data clerks who use DHIS at Ekurhuleni Health District?

5.2 Conditioning factors for capacity building

5.2.1 Age of participants

In this study, there were 98 survey participants: 19 participants were between the ages of 20 and 30 years. The findings of this study indicate that capacity building was more beneficial to younger participants. Younger participants who received training rated the quality of the training as excellent. This implies that the training they received was beneficial to them and empowered them with the skills and knowledge they need to fulfil their role as a data clerk. Younger participants were found to be more able to capture and analyse data on DHIS. It can also be indicated that younger participants are perhaps more technologically savvy than older participants. Since capturing and analysing data is done on the computer, younger participants rated their computer skills higher than older participants.

These findings concur with the study by Kubeck et al. (1996), which indicates that younger trainees grasp technical skills better than older trainees. Older trainees need

more time in order to grasp the content compared to their younger counterparts. The findings of this study also support the finding from English et al. (2011) that technical skills are needed for data capturers to be able to analyse data on DHIS.

Another indication that younger participants aged between 20-30 years have benefited from capacity building is that, when they were asked to rate their ability to capture and analyse data on DHIS, almost all of them rated their confidence in capturing and analysing data on DHIS as excellent. In comparison, of the participants aged 41 years and above, only 60.6% rated their confidence in creating favourites to analyse data as excellent. This implies that the training that was provided to the participants enabled them to capture and analyse data with ease. The findings of this study vary from the findings of English et al. (2011), which indicated that poor training was given to the data capturers. Participants in this study rated the training that they received as excellent. From these findings, it can be said that the younger participants experienced a better understanding of DHIS and the ability to manoeuvre the system. The workload did not have any impact, as although the participants rated the workload to be high, they still rated their confidence in capturing and analysing data as excellent.

There were 46 survey participants who fall in the age group 31-40 years. In comparing participants' confidence in capturing and analysing data, the study found that participants' confidence and ability to capture and analyse data was lower compared to the 20-30-year-old age group. However, participants who attended training showed a better understanding of capturing and analysing data on DHIS compared to those who did not attend training. This implies that, even in the 31 – 40 years age group, capacity building did have an impact in building the capacity of data clerks to be able to capture and analyse data on DHIS. Participants who attended training from this age group had a better understanding than those who did not. This aligns with findings from Hidayat and Budiatma, (2018) that training can improve employee performance.

The findings for this study of the ages between 31 and 40 years old also concur with the findings of Rodriguez and Walters, (2017), who indicate that training and development make employees more efficient and productive at work. Training serves as a means to fulfil both personal and organisational job-related requirements and aims to enhance the work culture of groups involved in collective tasks. (Chidambaram

and Ramachandran 2012). An effective training program alters attitudes, enhances skills, and fosters a forward-looking perspective in participants regarding the task (Chidambaram and Ramachandran 2012). Imran et al., (2023) also found that training and development interventions that are well-designed improve employee performance significantly.

Of the survey participants, 33 participants were aged 41 years and above. When it came to the capture and analysis of data on DHIS, this age group rated their confidence level in analysing data lower than the other age group. They also rated their computer skills lower than the other age groups. While this age group reported benefitting from capacity building, the effects were lower compared to the other age groups. Some participants benefited from the training, while for others there was no significant impact: although they received training, they rated the quality of the training as below average.

The majority of participants (81.8%) in the age group 41 years and above have more years of experience and one might expect them to excel better than those with fewer years of experience. However, as Kubeck et al's (1996) study found, older trainees may grasp content and processes more slowly than younger trainees. The findings of this study also indicate that younger participants are better equipped to analyse data on DHIS compared to older participants. This can be observed when only one participant between the ages of 20-30 rated their confidence to analyse data on DHIS as poor. Additionally, there were only two participants of the same age between 20-30 years who rated their confidence in creating favourites as poor. This implies that younger participants did not struggle to analyse data on DHIS. The favourites (data visualiser), provide data clerks with the opportunity to view what they have captured and to make sense of the data. Through favourites, they are able to see if there are gaps and also the pattern of their captured data. Training for data clerks that involves older age groups (e.g. 41 years and above), however, may need to be planned in a way that will incorporates practical modes of learning as older people tend to understand better when they learn by doing (Sen 1966).

5.2.2 Level of education

The level of education also has an effect on how one grasps and internalises what has been learned. Those with higher levels of education, according to Hare (2003), may happen to be open-minded and understand new concepts better.

In this study, it was found that participants with degree qualifications were more likely to have a better understanding of how to capture and analyse data than those with lower educational qualifications. The findings of this study further tell us that education conditioned the effects of capacity building on the data clerks to enable them to capture and analyse data in Ekurhuleni health district. Although participants were trained, those with lower levels of education still experienced challenges with regard to capturing and analysing data. This can be seen when they were asked to rate their confidence in capturing and analysing data, where they rated their confidence lower than those with a higher level of education.

When asked to rate the quality of training they received, it can also be noted that the participants with lower levels of education rated the quality of training they received as lower than those with a higher level of education. This implies that when the training is being planned, there is a need to factor in the level of education of the participants so that they can also benefit from the training provided.

Another way can be to review the level of understanding of the participants before training commences so that the trainer has a baseline of the trainees' level of understanding. Those who have attended training also indicated that they still had challenges capturing and analysing data on DHIS. Ball et al., (2007) in their study found that education had minimal influence on training improvement. However, in this study, education impacted participants' perceived improvements and confidence. It can be said that education combined with training had an impact on the participants' ability to capture and analyse data on DHIS. With regard to data analysis, the study has found that only one (11.1%) participant who had a degree rated the ability to create favourites on DHIS as poor, compared to five participants with a diploma (11.9%) and ten with grade 12 (21.23%). This implies that participants with higher levels of

education were better able to create favourites for purposes of analysis on DHIS compared to those with lower levels of education.

The level of education, coupled with capacity building, positively affects the capacity of data clerks in Ekurhuleni to be able to analyse data using favourites on DHIS. Those with higher levels of education were more able to create favourites and ultimately analyse data. This finding is in line with the human capital theory's claim that the more an employee is educated, the more that employee will ultimately perform (Carneiro et al, 2010). The finding of this study is also supported by Tachibanaki (2001), who indicates that in human capital theory, education boosts productivity and the skills needed for the job.

5.2.3 Years of experience

Experience is an important teacher. When one learns something, one has to practice it, and frequent practice makes one perfect. However, experience alone cannot make one perfect; one first has to be trained. In this study, it was found that experience was identified as one of the factors that conditioned the effects of capacity building of data clerks to be able to capture and analyse data in Ekurhuleni health district. Although there were participants who did not attend training, they were better off if they had more years of experience in capturing data, compared to those with fewer years of experience in capturing data. Johnston (1994) indicated that experience is the best teacher, and this study concurs that indeed, experience has a positive impact on learning. It can be said that experience coupled with training enhances the capacity of an individual to perform at his/her best.

Experience is said to be a factor because participants who have more years of experience rated their confidence in capturing and analysing data higher than those who are less experienced. For participants who had not received training, their rating of confidence in capturing data averaged at 3.6 on a Likert scale of 1-5, while the rating for those who had received training averaged at 4.1 on the Likert scale. Having received training thus provided a better understanding of how to carry out daily activities of data capture. It can also be said that the experience that participants had in dealing with data has taught them to understand and be able to capture data on DHIS. Although some participants did not receive training, they reported being able to

capture data on DHIS as much as those who had been trained. In comparing capture and analysis, 19.7% of participants with more experience rated their ability to create favourites as poor, compared to 18.2% with 0-2 years of experience and 9.5% with 3-5 years. More years of experience did not improve their data analysis ability compared to capturing data using favourites. The findings of this study indicate that more still needs to be done to ensure that data clerks not only understand capturing but also know how to analyse data using favourites. More effort is still needed to capacitate data clerks to be able to analyse the data that they capture.

5.3 Effects of Capacity Building

5.3.1 Analysis of participants who did not receive training.

Human capital theory highlights the significance of both structured and unstructured training in enhancing a person's skills and income potential in the production process (Almendarez 2013). The trained employee has more opportunities than an untrained employee. Although some of the survey participants indicated that they did not receive capacity building, it can be noted that workplace learning did take place as they were somewhat able to capture and analyse data. Traditional workplace learning is still crucial because skills must be acquired through practice (Dornan 2012). It can also be indicated that peer learning also assists participants in understanding data to be able to both capture and analyse. Some participants indicated that, when they experience any challenges regarding capturing of data on DHIS, they call their peers either from the same facility or a neighbouring facility to assist with the challenge they are experiencing.

This shows how participants manage their respective facilities if they encounter any challenges. le Clus (2020) indicates that, in the workplace, continuous learning can happen through both formal training programs and informal learning opportunities integrated into daily work tasks. This implies that, as one carries out activities on a daily basis, learning is also taking place as there is repetition of activities on a daily basis. Although the participants have not attended training, it can be said that they have some understanding of what is expected of them.

5.3.2 Analysis of participants who have attended training.

Findings from the survey data suggest that training did have a positive impact on participants' ability to capture and analyse data on DHIS. When comparing the confidence level of participants who have received training and those who have not received training, it can be said that training has an impact on capacitating participants to do their job efficiently. Training contributes to building the capacity of data clerks in Ekurhuleni health district to enable them to capture and analyse data. Participants who have taken part in capacity building have rated their confidence in capturing and analysing data as excellent compared to those who have not taken part in capacity building.

The interview findings have also reinforced what participants indicated in the survey questionnaire by highlighting that indeed training had helped them to be able to capture and analyse data better than before they took part in capacity building. Participants said the following:

".. Training has helped a lot, yeah, because we didn't understand first. But like since the trainings were provided it's easier to capture. Because we understand what we do, we also understand the services." (Participant 1)

"..*Training helps us a lot so that if ever maybe you forget something when you keep on training, training. It's also you can minimise your mistakes"* (Participant 2)

"*It made me do my job very easily. I can manage everything without asking anyone."* (Participant 4)

From the above participants' interview statements, it is evident that indeed participants have found capacity building to be effective and improved their understanding of data. Elnaga and Imran (2013) suggest that training is a way to enhance capacity and help employees perform tasks more effectively, contributing to human capital development. Indeed, capacity building is a valuable tool to build human capital as participants indicated that they now do their job with ease compared to before they had undergone capacity building. This finding is in line with the assumptions of human capital theory,

which indicates that when an employee is trained, they perform better than those who were not trained. The findings of this study are in line with the findings of Khan et al. (2011) who found that capacity building improves the skills of data clerks to capture and analyse data. The finding also aligns with Eide and Showalter (2010) who found that training improves individual performance by equipping them with the skills needed for the job. Almendarez (2013) supports this notion by indicating that formal education is an investment in human capital due to its contribution to a productive population.

5.4 Workload of Participants

Survey participants indicated that they experience a high workload in their respective facilities, which affects how they carry out their duties. A high workload negatively affects an employee to produce quality work as they are usually pressed for time to complete tasks. They are expected to do more tasks other than capturing on DHIS. 83.7% of survey participants rated their workload as being high in their respective facilities. There was a mixture of results with participants indicating that they had a high workload because they were alone capturing on DHIS, while others indicated that they were not alone but were expected to do other clerical duties, such as opening files for patients and managing the admin area. Most of the survey participants indicated that they are mostly expected to capture on DHIS as well as capture on tier.net (an electronic register for HIV and TB). Survey participants shared the following regarding their workload.

"Capturing on tier.net, registering patients, retrieving files, and filing them back" (Survey Participant 73)

"Capturing on tier.net, collecting stats and sending reports" (Survey participant 23)

The above survey participants are two of many who indicated that they are not only focusing on DHIS on a daily basis but are also expected to do other activities, such as capturing on tier.net and also registering patients and retrieving their files and filing those patients' files back when they have completed their clinic visit.

The interview participants also shared the same sentiment indicated in the surveys regarding the high workload that they experience on a daily basis within their facilities. Below is what the interview participants said about the high workload:

“I am the only one who is capturing on DHIS. We must be two or three as we go on leave.” (Participant 1)

“So, the workload when you are alone is. It's too much”. (Participant 4)

The workload is heavy, it's heavy.” (Participant 14)

I’m expected to capture on tier.net, file patient results in the file, do reports for the facility, such as ambulance report, Patient waiting time, Momconnect report and TB report and e-health functionality” (Participant 9).

In a study conducted in the Free State by Malakoane et al. (2020), it was found that information management was having a problem within the districts as data clerks in facilities were expected to perform administrative tasks, such as assisting with the creation of new patient files. This study's findings concur with the results of Malakoane et al’s (2020) study as data clerks in Ekurhuleni are also expected to perform administrative duties. When an employee is fatigued, they don’t perform at their best, they are prone to make errors and end up completing tasks to adhere to the time limits. Although one participant has indicated that, although the workload is high, he has learned to work under pressure and is managing adequately. It can be said that not all participants are able to work under pressure.

Increased workload negatively impacts employee performance, meaning higher workloads decrease potential performance, while reduced workloads boost it (Adi and Ali 2022). When there is more than one data clerk, teamwork is essential in order to assist one another to complete tasks on time and to maintain the quality of data. When they work as a team, if one has made an error, the other one can be able to pick it up and correct it promptly before the data leaves the facility. However, when one is working alone, a colleague is not able to recheck the captured data on DHIS. One interview participant indicated that they assist each other in their facility as they are

two: “*We don't have that much of a workload, we assist each other. It's only the two of us doing webDHIS”* (Participant 19).

This finding is in line with that of Nicol et al (2017) who found that work overload negatively affects the data clerk’s ability to do their task diligently. When pressed for time, they end up producing poor quality data. Although one might be experiencing a high workload, according to human capital theory, it is expected that an employee will be highly productive if they have received training and can finish more tasks with little effort (Carneiro et al, 2010)

5.5 Completeness of source documents

On a daily basis, data clerks are expected to capture data from the clinician’s tick registers, headcount book and other registers in the facility that must feed DHIS. The primary health care tick registers are the registers that clinicians use when they consult clients on a daily basis in the consulting room. The completion of the record is of pivotal importance because they are the source for DHIS: They are official documents that are used for audit by the Auditor General of South Africa and also provide information on how the facility is performing against the set targets. When there are litigations brought against the clinician or facility, these records will be the first point of contact.

This study found that data capturers are struggling with incomplete source documents which affects their work and the quality of the data that they capture. When the records are incomplete, data clerks are faced with challenges on what to capture and how to capture incomplete records. When the records are incomplete, it harms the quality of the data and causes gaps in the system. The completeness of the source document is a factor that hinders the capacity of data clerks in Ekurhuleni health district. This is identified as an area that needs improvement to enhance the capacity of data clerks to capture and analyse effectively.

In this study, interview participants indicated that incomplete records are negatively affecting how they do their work. Participants complained that clinicians make their work difficult as they must follow them up to ask them to close the gaps in their registers: “*The only person that knows the importance of the ticks, it's me and me*

alone. The nurses think their job is to say next patient." (Participant 11). According to the South African National Department of Health (2012) DHMIS policy, clinicians are expected to ensure that the tick register is complete and there are daily summaries. However, participants indicated that clinicians tend to forget about the documentation of the registers. As one participant remarked:

"*Clinicians would most of the time make mistakes, but it's not all of them, so I think they need to be reminded on how to Tick and also how to write on the files because we would get mistakes every now and then and when we go and remind them I think they don't understand the importance of them doing the right thing for us to be able to capture the correct thing."* (Participant 19).

The findings of this study are in line with the findings of Asah's (2021) study in KwaZulu Natal, where it was found that during data compilation, data clerks struggled to extract information from the tick registers due to nurses' illegible handwriting. Verifying and validating the data was time-consuming, as data clerks had to spend additional time seeking clarification from nurses about their recorded values (Asah 2021).

According to the Health Professional Council of South Africa (2023), the records must be complete, concise and consistent. The South African Nursing Council (1985) indicates that professional nurses must maintain precise and accurate records of all actions taken related to a patient and that failure to do so will be regarded as negligent or an omission. The Neonatal Nurses Association of South Africa (2023) indicates that common errors that nurses make include unreadable handwriting, absence of dates, times, and incomplete or missing records, subjective entries instead of factual ones, use of abbreviations, and recording information on the incorrect chart. These types of error affect the quality of data in the facility. In the study by Nicol et al (2017), it was also found that incomplete data affects data quality. Clinicians often forget to fill in the registers, which then affects the collection and reporting of data. However, according to human capital theory, the data clerks must possess the numeracy and data analysis skills needed for their job to be able to solve problems (Deming 2023).

5.6 Supportive supervision

In this study, it was found that supportive supervision was sometimes lacking, which consequently affects the effects of capacity building interventions in Ekurhuleni health district. Supportive supervision is one of the conditions that enhance the effects of capacity building, as stated by Obisi (2011). Supportive supervision offers data clerks the opportunity to ask questions and request feedback on data-related matters. If one is encountering a challenge at the facility, when the supervisor visits the facility, the data clerk can be able to ask questions, and the supervisor can even demonstrate practically how to do certain things. In Tanzania, feedback was identified as a key component in order to improve data quality and promote data usage in health information systems. (Sandstad 2023). In South Sudan, it was found that continuous supervision is essential for ensuring the proper skills needed for data quality. (Morris et al. 2024).

The study by Moloko and Ramukumba (2022) in Tshwane district found that clinicians receive less feedback from health information officers since they visit at least once a quarter, and that the visit includes checking family planning data quality and discussing performance measures based on the routine health information system (RHIS). Only a small percentage of clinicians reported that health information officers allowed them to discuss health information challenges (Moloko and Ramukumba 2022). This indicates that not only does data capture benefit from supportive supervision, but clinicians also benefit when they receive feedback from health information officers. When supportive supervision takes place, the facility will be aware of its gaps through feedback and will then be able to draw up a quality improvement plan for the facility. The interview participants said the following regarding the lack of supportive supervision.

“Our managers, not the facility manager, our managers, they must come and give us the support.” (Participant 16)

“*Come over to the clinics just to check our challenges every month to come for us and know how to assist us.” “My manager called them to come and assist us with something. They don't come,”* (Participant 4)

“…After training, maybe you receive like support and we can have people who come to support us to say this is how you do this, please fix this.” (Participant 8)

“*They should tell us if there's something on the DHIS that we need to check out.”* (Participant 19)

The above participant's statements were a testament that feedback coupled with support visits does condition the effects of capacity building. At training, one might not fully understand certain elements, but when it's one-on-one, such a misunderstanding can be addressed and corrected in the future. Although training is effective in building capacity, supportive supervision coupled with feedback is needed to ensure that one is capable and that any confusion that might be present can be cleared before more errors are made.

The findings of this study are in line with the findings from Nicol et al., (2017), who contend that feedback helps staff recognise where their work requires enhancement, but feedback was frequently lacking at the facility level. They further found that the frequency and quality of supervisory visits were identified as factors contributing to poor-quality data (Nicol et al., (2017). This study similarly found that supportive supervision was lacking in the experience of data clerks in Ekurhuleni. Since more participants are better able to capture data, supportive supervision can come in handy to assist data clerks to be able to create favourites and analyse data. When the supervisor is in the facility, the supervisor can guide the data clerks on how to create favourites and how to use favourites to analyse the captured monthly statistics. Supportive supervision can reinforce what was learned at training and ultimately allow data clerks to perform at their best (Nicol et al, 2017). It can remind them of what was learned at the training. Supportive supervision can be part of an informal education, which human capital theory indicates it an important tool to pass skills to employees (Tachibanaki 2001).

5.7 Mode of capacity building

The mode of training can either affect the trainee positively or negatively. How capacity building is delivered can have an impact on the trainee's ability to grasp what they

have learned. In this study, more participants preferred practical rather than theoretical sessions as they indicated that they could grasp more and internalise what they had learned. Both survey participants and interview participants shared the same sentiment about the mode of training that is best for them. The mode of training was identified as a factor that conditions the effects of capacity building interventions in Ekurhuleni health district for data clerks. It can also be indicated that the mode of training is one of the areas that has been identified as an area for improvement to enhance the capacity of data clerks to be able to capture and analyse data on DHIS. Interviewed participants said the following concerning the mode of training:

"*Train without computers you sometimes forget, so at least when you're doing it practically when you go back to the facility then you remember you would see I clicked here the last time I was in the training zone."* (Participant 19). This participant indicates that when they trained with computers, they would easily internalise what they had learned. They will not forget, as they would have learned by doing. The study by Nicol et al., (2017) also found that participants preferred a participatory type of training rather than a training where one sits and listens.

Most participants indicated that practical training is best suited for them. They also indicated that, in the training, there must be computers so that they can learn by doing. This is an indication that, for training to be effective, the training must be well-suited to the trainees. Because capturing involves doing things practically on the computer, there is a need to ensure that computers are available, and that trainees are afforded the opportunity to learn by doing. This might allow them to internalise what they would have learned. Survey participants said the following.

"Everyone to be on the computer while training is on", Survey participant 78.

"After training, we need to practice", Survey Participant 27

"Computer lab for practical and data elements champions" Survey participants 35

The study findings from both phases of data collection provide the same findings, indicating that the mode of capacity building can either hinder or condition the effects

of capacity building. Participants received theoretical training but expressed a preference for practical training instead. Practical training offers the opportunity for the data clerks to practice how to analyse data by using dashboards embedded in the DHIS such as using data visualiser. This means that, while at the training, they can learn and experiment with how to analyse data rather than writing notes, which they can easily forget. The findings of this study align with those of Nicol et al (2017), who indicate that in-service training is the most preferred method of capacity building as it is engaging and practical. According to Tachibanaki (2001), in human capital theory, both formal and informal types of education are important to impart the skills needed for employees to carry out their tasks.

5.8 Identified gaps in capacity building in Ekurhuleni health district.

The study has identified some areas for improvement to enhance the impact of capacity-building interventions, related to: supportive supervision, mode of training, frequency of training, and completeness of the source documents.

5.8.1 Supportive supervision

The supportive supervision that the data captures receive in their facilities was identified as a gap that needs improvement. The data captures were not receiving supportive supervision as needed, and they were also not receiving feedback promptly. Feedback assists data clerks to improve in capturing and provide quality data. Through feedback, they will know where they are making mistakes and improve on them. Feedback was found to be lacking, together with supportive supervision.

5.8.2 Mode of training

Regarding the mode of training that the participants received, the majority indicated that it was a theoretical kind of training without practical. The study has identified the mode of training as a gap, as more participants opted for a practical type of training,

with computers, where they would be able to practice and remember what they did at the training.

5.8.3 Frequency of training

At the moment, the participants have indicated that the frequency of training is not what they wish for as the training is usually annually. The participants indicated a preference for training at least quarterly. When trainings are conducted more frequently, more people will be trained and those who have been trained previously can get refresher training.

5.8.4 Completeness of the source documents

This study has identified incompleteness of the source documents as a challenge for data clerks in capture and analysis. Source documents are completed by clinicians when they consult the clients in the facility, and they are the documents that feed the DHIS. The same systems are used by the Auditor General of South Africa (AGSA). When the source documents are incomplete, it means that, even in the system, there will be gaps. Although the data clerks can be trained to capture and analyse data, incomplete clinical records will affect the quality of data captured. This in turn, impacts analysis. However, training might assist them to be able to identify gaps in the data collected.

5.9 Areas for improvement for capacity building in Ekurhuleni Health District

The above gaps have been identified and give rise to several areas for improvement to enhance the capacity building of data clerks in Ekurhuleni Health District. Drawing on the data, the following areas of improvement have been identified: frequent supportive supervision, practical training, in-service training for clinicians and in-service training for data capture.

5.9.1 Frequent supportive supervision

Supportive supervision has been identified as lacking at some facilities, as participants indicated that when they call the supervisor to assist them, the turnaround time is very slow. However, a participant indicated that, even if a supervisor does come to support them, they hardly spend 30 minutes in the facility to support them in areas where they might be lacking. The data capture supervisors need to support the data clerks at their facilities to be able to guide them and solve any challenges that they might be experiencing. When the supervisor visits the facility and provides feedback to the facility manager or the whole facility, it gives the data capture and the facility staff as a whole a sense that their data is being checked frequently and that they need to improve in any areas identified.

5.9.2 Mode of training

Both survey participants and interview participants indicated that they need practical training as a mode of capacity building where there will be computers to enable them to learn by doing. Future training needs to incorporate practical sessions, using computers, to enable data capturers to internalise what they are practising. When they learn by doing, they will be able to remember how data was captured during the training, compared to just sitting and listening to the facilitator. Practical sessions will maximise the outcome of the training for trainees.

5.9.3 In-service training for clinicians

Participating data captures indicated that there is a disjuncture between clinicians' inputs and the data required. There is a need to bring the clinicians on board to understand that their input on forms, and the ticking of required data fields, has a bearing on the quality of data for the facility. When they don’t complete the required fields, it means that what will be reflected in their monthly statistics is not a true reflection of what has transpired in the facility.

Although the data clerks are being trained, the clinicians are the ones who collect data when they interact with the clients. They need to be trained on data quality. They must

also be inducted to the DHMIS policy. Training to enhance understanding of their responsibilities concerning data. They will also know that they must do data verification before data can be sent to the next level.

5.9.4 In-service training for data captures

The data clerks indicated that they need frequent in-service training to be able to be reminded how to capture or analyse data, as, due to the workload, they may end up doing the basics only and forget other things. The data clerks indicated that they require at least quarterly in-service training to be reminded of DHIS functions and tasks.

5.10 Conclusion

In this chapter, the researcher has discussed the findings of the data collected in both phase one and phase two. Findings suggest that training has contributed positively to building the capacity of data clerks in Ekurhuleni health district to enable them to capture and analyse data. Other factors that have conditioned the effects of capacity are the age of participants, level of education as well and years of experience. When supportive supervision is provided, it serves as an enabling factor that enhances the effects of capacity building. This study's findings suggest that education enhances productivity by providing skills through formal schooling and job training. The study also found that there are factors that limit the effectiveness of capacity building which include participants' workload, completeness of the source documents and the mode of capacity building. The mode of capacity building can be both a limiting and an enabling factor. In the next chapter, the researcher will discuss the recommendations of the study.

Chapter 6

Conclusion and recommendations

6.1 Introduction

In this chapter, the researcher shares the study's key conclusions and highlights recommendations for improving capacity building effectiveness for data clerks in Ekurhuleni Health District. The study aimed to understand how training has contributed to building the capacity of data clerks in Ekurhuleni Health District to capture and analyse data. Another aim of the study was to identify the factors that have conditioned the effects of capacity building interventions in Ekurhuleni Health District and lastly to identify whether there are areas for improvement to enhance the capacity of data clerks who use the DHIS in Ekurhuleni Health District.

The research questions posed in the study were: 1. How has training contributed to building the capacity of data clerks in Ekurhuleni Health District to enable them to capture and analyse data? 2. What factors have conditioned the effects of capacity-building interventions in Ekurhuleni Health District? 3. What are the areas for improvement to enhance the capacity of data clerks who use DHIS at Ekurhuleni Health District?

The study found that data clerks are being capacitated, and they have indicated that capacity building has improved their skills to better capture and analyse data. They are better able to capture and analyse data than before they received the training. There were some discrepancies in capacity building, where some data clerks needed more reinforcement than others. The factors that contributed to the discrepancies were age, level of education, supportive supervision, high workload, and the type of capacity building.

Overall, participants preferred a practical and interactive type of capacity building compared to a theoretical type of capacity building. There is also a need for capacity building for clinicians in the facility, as their tasks directly impact the activities of the

data clerks and the quality of data captured. Data quality can only improve if all those involved in data are trained on the DHIMS policy.

The findings of this study suggest that training interventions enhanced data clerks' potential, adaptability, efficiency, and effectiveness in data capture and analysis. Capacity building empowered data clerks with the skills they need to be able to capture and analyse data. The study identified some enabling factors for capacity building, including the age of participants, their level of education and their years of experience. Age was found to be an enabling factor for younger participants, as opposed to older participants, in their ability to adapt and learn new skills to capture and analyse data.

A higher level of education was also an enabling factor in both capturing and analysing data. Those with a higher level of education have a better understanding and are also better placed to understand new concepts. Years of experience were an enabling factor with regard to capturing only. More years of experience meant that clerks are able to capture data with ease. It also meant that they are doing one thing repeatedly over time and thus become more familiar with their daily duties.

More years of experience was not an enabling factor for data analysis, however. Those with more years of experience had difficulty analysing data compared to those with fewer years of experience. The reason for this finding might be because the majority of those with more than 5 years of experience fall in the age category of 41 years and above. This age group are not tech-savvy like the younger age group. Of those aged over 41 years, the highest level of education amongst the majority was a diploma, followed by matric, with only one holding a degree.

The study has found that, overall, capacity building enables the data clerks to better capture and analyse data. However, other limiting factors affect capacity building. Capacity building alone was not sufficient to capacitate data clerks to capture and analyse data proficiently. The study identified several factors that negatively impact capacity building, including lack of supportive supervision; incompleteness of the source documents; high workload; infrequency of training; and the mode of training, which tends to be theoretical rather than practical. If these factors can be addressed, capacity building can be able to reach the desired goals.

6.2 Limitations

The main limitation of this study is that it was limited to a single district, which means that the findings cannot be generalisable to other health districts but only to Ekurhuleni Health District. The findings and the conclusions might not be drawn to the other districts, although they may still be useful for health districts implementing similar capacity-building programmes.

However, although the research was only conducted in a single district, the research has managed to shed light on issues that affect data quality in the public health sector and have been identified in other studies across South Africa (Manesen et al. 2021; Nicol et al. 2013; Roomaney et al. 2017). This indicates that more still needs to be done to ensure that the data being reported is of high quality and can be dependable.

Below are some of the strategies that can be used to improve the gaps identified in chapter five to enhance capacity-building effectiveness.

6.3 Recommendations

6.3.1 Mode of training

The mode of training has a bearing on the treatment outcomes. Before training can be implemented, there is a need to analyse and identify the gap that the training seeks to address. When training is done without planning and needs identification, training might take place just to tick a box. From this study, the participants preferred practical training sessions where trainees would be learning by doing. Currently, the training that is being implemented is more theoretical than practical. The study recommends that the training given to the data clerks be more practical so that they are able to apply and internalise it.

6.3.2 Frequency of training

The frequency of training offers the trainee the ability to ask questions and clarify where they might be experiencing challenges. When training is done frequently, trainees are able to revive their skills. Refresher training allows the trainees to refresh skills and be reminded of how to capture or analyse data. In this study, the participants indicated that they usually attend training once a year. The study recommends that

training must be done as and when there is a need, such as when there is an introduction of new data elements. It is also recommended that, in the monthly meetings, data analysis be introduced to better equip data clerks in data analysis.

6.3.3 Workload

Employee performance can be affected positively or negatively by workload on a daily basis. A high workload means that an employee has to make more effort in order to meet the demands of their work. Participants in this study indicated that they have a high workload, and it affects how they carry out their duties. They are expected to capture data on DHIS as well as manage the reception area. Other participants indicated that they are alone in the responsibility to capture data on DHIS as well as on tier.net. The study recommends that there be at least two data clerks in a facility who are able to capture data on DHIS and provide support to one another.

6.3.4 Completeness of source documents

The completeness of source documents affects the quality of data that clerks capture on the system. Participants indicated that when training is done, it is only done for the data capturers and does not include clinicians. This results in clinicians perhaps not understanding how incomplete registers affect the data quality. The study recommends that clinicians also be in-service on the importance of completing the register for accurate data capture.

6.3.5 Supportive supervision

Supportive supervision offers data clerks the opportunity to be guided on how to capture and analyse data at the facility. Supportive supervision offers managers the ability to guide and also give feedback to data clerks and to the facility as a whole to point out areas of improvement. When the manager visits the facility frequently, they are able to pick up the challenges that the data clerk is experiencing and guide them promptly. Participants in this study indicated that they hardly receive support from their managers, either in the facility or through monitoring of their data in the system. HIS sub-district managers might better support data clerks, at least once a month. The study also recommends that HIS sub-district managers monitor facility data on DHIS and provide feedback on data capture and the facility as a whole, at least monthly. By

doing so, they will be able to correct any wrongdoing before the stats leave the sub-district.

6.4 Conclusion

The purpose of the study was to find out how capacity building interventions have contributed to building the capacity of data clerks in Ekurhuleni health district. The study aimed to understand how training has contributed to building the capacity of data clerks in Ekurhuleni health district to enable them to capture and analyse data. Another aim was to identify the factors that have conditioned the effects of capacity building interventions, and to identify whether there are areas for improvement to enhance the capacity of data clerks who use the DHIS in Ekurhuleni.

Data was collected in phases; phase one was a survey, and phase two was an interview. The study found that capacity building does improve the ability of data captures to capture and analyse data. Training has contributed to building the capacity of data clerks to be able to capture and analyse data for the purposes of the HIS in Ekurhuleni health district. However, there are factors that can counter the effects of capacity building and need to be taken into consideration when planning and designing capacity-building interventions. These include the age of participants, their level of education and their years of experience. Each of these plays a significant role in conditioning the effectiveness of capacity building. Data clerks' workload, the completeness of the source documents, supportive supervision, frequency of training, and mode of training were also identified as critical areas where adjustments or changes can be made to enhance the effects of capacity building for data clerks in Ekurhuleni health district.

Capacity building is an important tool to ensure that employees acquire the skills needed to accomplish a task. Although data clerks can be trained, there are external factors that affect data quality. Data clerks alone cannot turn around the data quality issue. The completeness and reliability of the captured data doesn't solely rely on the data clerks but on all the team members in the facility.

The data clerks in Ekurhuleni indicated that capacity building has contributed to building their skills. The study findings, however, indicate that capacity building alone is not enough. Data clerks require supportive supervision in the facility to reinforce

what they have learned during training. The other stakeholders, such as the nurses and the facility manager, must champion the data quality in the facility. The study also shows that data quality is not a one-man show, but a team effort. If all stakeholders involved in the collection and reporting of data come together and work together, the data that gets reported will be of high quality and will be dependable.

Although there were limitations to this study, it provides information on issues that affect capacity building in the public health sector more broadly. The data clerks must possess the numeracy skills to enable them to interrogate the data that they work with. The facilities must be adequately staffed and with the required tools to ensure that data clerks can carry out their tasks efficiently. This requires having the time to both capture data and analyse what they have captured on a daily basis.

Capacity building must also include all the people involved in data in the facility, and not only the data clerks. The facility manager, as the accounting officer in the facility must be capacitated to interrogate the data before it is reported. Supportive supervision must be conducted at least monthly in the facilities to ensure that the data is of high quality and can be used for decision making. When capacity building is conducted, it must be more practical rather than theoretical to ensure that the trainees can internalise the training content. Future studies need to assess clinicians' level of understanding with regard to data quality.

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Annexures

Annexure 1. Survey questionnaire

Thank you for agreeing to take part in this online self-administered questionnaire. My name is Radzilani Avhafhati, I am a student at the University of the Witwatersrand in Johannesburg. I am doing a master's degree in management (Monitoring and Evaluation). How have capacity building interventions contributed to building the capacity of data clerks at Ekurhuleni Health District. The questionnaire will be seeking understanding as to how capacity building has contributed to building the capacity of data clerks in the Ekurhuleni health district.

You have been selected to participate in this study because you are a data clerk in your clinic. You are assured that all the information gathered by this online questionnaire will be kept confidential and your identity will not be divulged.

Please answer the following questions:

Which of the following age group best describes yourself?

Less than 20yrs	20–30yrs	31–40yrs	41yrs and above

Which gender do you relate to?

Male	Female	Unisex

What is the highest qualification that you have completed?

Secondary	Grade 12	Diploma	Degree	Postgraduate

How many years of experience do you have working as a data clerks?

0-2 years	3-5 years	5 years and above

Which facility do you work at?

……

Are you only responsible for capturing and collating data on webDHIS?

Yes	No

If you said no above what other activities are you expected to do in the facility?

……..

Are you the only one who is expected to collate and capture data into webDHIS?

Yes	No

How would you rate the workload at this facility on a scale of 1 to 5 where 1 being simple and 5 being very busy?

1 2 3 4 5

How can you rate your ability to manoeuvre webDHIS on a scale of 1 to 5 where 5 is easy and 1 being hard?

1 2 3 4 5

How do you rate your computer skills on a scale of 1 to 5 where 1 is poor and 5 being excellent?

1 2 3 4 5

Have you ever attended any form of capacity building such as training and workshop for DHIS?

Yes	No

If yes which type of capacity building did you attend?

……

How often do you attend capacity building in your sub-district?

Monthly	Quarterly	Twice a year	Once a year

When last did you attend any form of capacity building?

Within 6months	7-12 months	1-2years	➢ 2 years

How can you rate the form of capacity building that you have received? on a scale from 1–5? (1 being the least effective and 10 meaning very effective)

1 2 3 4 5

How well do you understand DHIS data elements? On a scale of 1–5 (1 being the least and 5 indicating you understand elements well)

1 2 3 4 5

How confident are you in analysing DHIS data? On a scale of 1–5 (1 being least confident and 5 indicating very confident)

1 2 3 4 5

How can the training be improved?

How can your skills and understanding of data elements be improved?

What do you do when you meet a problem about data elements during capturing?

Annexure 2: Interview guide

Thank you for agreeing to take part in this second phase of data collection in the form of an interview. My name is Radzilani Avhafhati, I am a student at University of the Witwatersrand in Johannesburg. I am doing a master's degree in management (Monitoring and Evaluation). The study sought to understand How have capacity building interventions contributed to building the capacity of data clerks at Ekurhuleni Health District?

1. When was the last time you attended capacity building?
2. Did capacity building contributed to building your capacity (yes/no)
3. Why do you say so?
4. How did capacity building contributed to building your capacity as a data capture?
5. What is it that could have been done differently to ensure that capacity building contributed to building your capacity as a data clerk?
6. What are the strategies that the district can come up with to support the data clerks during capacity building?
7. What are the recommendations that can be implemented by the district to enhance capacity building?