

RESEARCH REPORT

**ANTIRETROVIRAL THERAPY AVAILABILITY AND EQUITY OF VIRAL LOAD TESTING
FOR TREATMENT FOLLOW-UP AT EISLEBEN CLINIC, LIMPOPO PROVINCE**

By

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MINI-DISSERTATION

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DECLARATION

I declare that Antiretroviral therapy availability and equity of viral load testing for treatment follow-up at Eisleben clinic, Limpopo Province is my own work and that all the sources that are used or quoted have been indicated and acknowledged using complete references and that this work has not been submitted before for any other degree at any other institution.

Declaration by

MOKGEHLE BELINDA MOKGADI

Student number



Signature

DEDICATION

Having noticed that clinics in rural areas have challenge in the availability of viral load testing, this study is dedicated to all the primary healthcare facilities who have directly or indirectly experience challenges in Viral load testing for patients who are on ART programme.

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For the success of this study, I would like to thank GOD OF MOUNT ZION who gave me life, wisdom, strength, understanding and guidance throughout my academic life. I acknowledge that without GOD, I cannot do anything.

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ABSTRACT

Background: Many studies have investigated patient-level causes of poor treatment outcomes, data on the effect of health systems on ART outcomes are scarce. Globally, ascending access to Human Immunodeficiency Virus (HIV) viral load testing for individuals living with HIV undergoing antiretroviral therapy in poor settings is a health priority. The global roll-out of HIV treatment has saved millions of lives: an estimated 16.5 million AIDS-related deaths have been averted since 2001. Literatures indicates that there has been a rapid scale up in the provision of Antiretroviral therapy (ART) in Sub Saharan Africa in the last decade with more than 7.5 million people receiving treatment by the end of 2012. In South Africa, HIV care is provided by both the private and public sectors. Notwithstanding that majority of public hospitals in South Africa have poor service delivery. The aim of the study is to determine Antiretroviral Therapy Availability and Equity of viral load testing for treatment follow-up at Eisleben clinic, Limpopo Province.

Methodology: The study was qualitative in nature and used exploratory and descriptive design. The sampling of the study was purposive and involved nine (9) participants who met the criteria of the study: participants who are on antiretroviral therapy, 18years and above, both males and females. The study was conducted in Eisleben clinic, Capricorn district, Limpopo Province South Africa. Data collection was done through face to face interviews and analyzed using Thematic Content Analysis (TCA) to gain in-depth experience in the patients who are on treatment.

Results and conclusion: The study found that barriers to access viral load testing were identified at all levels, health system, community level and patient level. This study shows that there is lack of sufficient knowledge on the factors that controls viral load suppression on patient who are taking ART. Some highlighted that the clinicians who are offering the treatment in the clinics need to explain and teach them to increase knowledge of the factors that controls the viral load suppression. It has been observed that shortage of staff in Eisleben clinic contributes to lack of health education to inform the patients about their health status. Amongst adult patients in the region, various barriers to ART adherence have been identified: fear of HIV status disclosure, HIV-related stigma, alcohol use and drug abuse, forgetfulness, complicated ART regimens, pill burden, side effects, transportation costs, and financial constraints.

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LIST OF ACRONYMS

AIDS – Acquired Immuno-Deficiency Syndrome

ANC – Antenatal Care

ART- Antiretroviral Therapy

HIV – Human Immunodeficiency Virus

MEDLINE – Medical Literature Analysis and Retrieval System Online

PUBMED – Public/Publisher MEDLINE (NLM journal articles database)

LFT – Liver Function Test

PMTCT – Prevention of Mother to Child Transmission

SA – South Africa

UNAIDS – United Nations Programme on HIV/AIDS

UNICEF – United Nations Childrens Fund

UTT – Universal Test and Treat

WHO – World Health Organization

DEFINITION OF CONCEPTS

Antiretroviral therapy

The Joint United Nations Programme on HIV/AIDS (2014) defines antiretroviral therapy as HIV treatment that utilises a combination of two or more drugs. In the context of the study, the definition by the Joint United Nations Programme on HIV/AIDS (2014) will be adopted for the current study.

Availability

Availability refers to the quality of being able to be used or obtained (UNAIDS, 2014). In the context of this study, the word availability will be used to refer to the obtainability of ARV for patients living with HIV.

Equity

UNAIDS (2014) defines equity as the quality of being fair and impartial. In the context of the study, equity is used to refer to the effectiveness of the viral load testing among patients living with HIV at Eisleben Clinic in Limpopo province.

Treatment Follow-ups

Treatment follow-ups refer to care given to a patient over time after taking treatment for a disease (Avert, 2020). Follow-up care involves or includes regular medical check-ups, which may include a physical exam, blood tests, and imaging tests. Follow-up care checks for health problems that may occur months or years after treatment ends, including the development of other types of diseases like HIV/AIDS. The above definition will be adopted as described above in this study.

Viral Load Testing

A viral load testing measures the number of HIV viral particles per milliliter of blood (UNAIDS, 2014). A low viral load indicates that treatment is effective. A high viral load in a person on treatment indicates either that the medication is not being taken properly or that the virus is becoming resistant to the medication. This definition will be adopted in this study.

CHAPTER 1: GENERAL ORIENTATION OF THE STUDY

1.1. INTRODUCTION AND BACKGROUND

Globally, ascending access to Human Immunodeficiency Virus (HIV) viral load testing for individuals living with HIV undergoing antiretroviral therapy in poor settings is a health priority. Research emphasises by showing the benefits of repressed viral load of individuals and extended to the whole population (UNAIDS, 2014; The World Health Organization, 2016; Peter, Ellenberger, Kim, Boeras, Messele & Roberts *et al.*, 2017). History has taught people that the large-scale diagnostic test implementation has been slow and incomplete due to service delivery and other challenges, particularly in African countries. The Joint United Nations Programme on HIV and AIDS 90-90-90 strategy present great challenges to donors, national governments and technical partners and bring desired focus to the need to expand access to diagnostic tests (Kitchen, Bärnighausen, Dube, Mnisi, Dlamini-Nqeketo & Johnson, 2020).

Continently, the expansion of HIV testing in African countries have increased stakeholder perspectives on reaching the first 90-90-90 strategy (Gupta & Shah, 2015). The researcher in the study undertaken argues that there's an urgent need for the introduction of routine viral load monitoring within large-scale ART programmes even to the most disadvantaged areas such as the one in which the study is undertaken. The World Health Organization (WHO) guidance advocates for early antiretroviral therapy (ART) at higher CD4 counts to improve survival and reduce HIV transmission (Maddali, Dowdy, Gupta & Shah, 2015). As of 2019, a total of 7.6 million people were living with HIV in South Africa – 4.8 million women, 2.5 million men and 300 000 children (Johnson, Dorrington, & Moolla, 2017). According to the World Health Organization (2014) guidelines before people start ART, health care providers should begin to discuss in detail the patient's willingness to start ART. The researcher is of the view that regardless of preparedness of the client by the health worker, antiretroviral drugs treatment plan, dosage, schedule, potential benefits, possible and adverse reactions they need follow-up processes. Children living with HIV counselling should directly involve the caregiver and include a discussion about the disclosure of HIV status

and also to be monitored if they do follow the treatment plan (Bezabhe, Chalmers, Bereznicki, Peterson, Bimirew & Kassie, 2014).

The WHO guidelines recommend that all HIV-infected persons be retested before starting ART to ensure that HIV infection is correctly diagnosed. ART start-up should always consider nutritional status, any comorbidities, and other medications being taken to assess possible interactions, contraindications, and dose adjustments. The researcher's motivation to conduct this study is because of the widely documented success of ART, however, stakeholders continue to face the challenges of poor HIV treatment outcomes. While many studies have investigated patient-level causes of poor treatment outcomes, data on the effect of health systems on ART outcomes are scarce (Moyo, Chasela, Brennan, Ebrahim, Sanne & Long, 2016). Most importantly, In South Africa, HIV care is provided by both the private and public sectors. Notwithstanding that majority of public hospitals in South Africa have poor service delivery (Luthuli & Kalusopa, 2017). Therefore, there is a need for HIV viral load testing for individuals living with HIV undergoing antiretroviral therapy in poor settings and as well disadvantage areas affected by poor service delivery.

Viral load testing has been a global priority for monitoring the ART effectiveness (CDCP, 2021). WHO recommended viral load testing as the preferred monitoring tool for diagnosing and confirming antiretroviral failure on the patients follow-up (UNAIDS, 2016).

1.2. PROBLEM STATEMENT

The majority of people in low-resourced areas and poor backgrounds do not have access to viral load testing. As of 2019, a total of 7.6 million people were living with HIV in South Africa – 4.8 million women, 2.5 million men and 300 000 children (Johnson, Dorrington, & Moolla, 2017). There is a need for viral load testing for the follow-up clients at Eisleben clinic, Limpopo Province. Majority of people living with HIV who are being treated at different clinics are not aware of their viral load (UNAIDS, 2014). A study conducted Peter et al. (2017) recommended that studies should be undertaken to investigate the access of viral load testing in low-resourced areas like Eisleben clinic.

The World Health Organization (2016) recommended guidelines of national treatment programmes to be implemented in 2016, for example, immediate HIV treatment not just for sick patients, but then for all HIV-infected individuals. They estimated that the need for viral load testing globally will grow to as much as 30 million tests per year by the academic year 2020, with an increase in test demand of up to 35% annually.

There are challenges to the attainment of desired treatment outcomes, some unique to either sector. Health system factors include clinical mismanagement, poor quality of HIV care, lack of standardization, and poor regulation of services (UNAIDS, 2014). There are concerns of poor monitoring of HIV care and desired treatment outcomes in both sectors, particularly in public clinics under the care of the Department of Health and Eisleben clinic is not immune to the above-mentioned concerns. These factors have a negative impact on treatment, leading to poorer treatment outcomes like mortality, and increased risk of loss to follow-up (LTF). Eisleben clinic is located at a low-resourced area still find challenges in implementing viral load testing due to underdeveloped infrastructures and a lack of laboratories. A study conducted by Peter et al. (2017) found that “previous experiences with the introduction of new diagnostic tests in low-resource settings suggest that implementation challenges might slow scale-up”. Nonetheless, viral load test access has increased modestly between 2013 and 2015, despite the target of 90% access by 2020.

1.3. LITERATURE REVIEW

The foundation of conducting research is based on existing knowledge which is more about conducting literature review defined as a more or less systematic way of collecting and synthesizing information related to previous research (Snyder, H., 2019). In the current study, literature review focused in aspects of the roll out of ART which is grouped into global continent and local; the knowledge of patients living with HIV about the importance of viral load testing, the understanding of ART patients on their role in treatment follow-up, the barriers to access viral load testing and the international advocacy to reduce the cost of treatment. All these aspects are discussed in details in Chapter 2 of this report.

1.4. PURPOSE OF THE STUDY

The study aims to explore the Antiretroviral Therapy Availability and Equity of viral load testing for treatment follow-up at Eisleben clinic, Limpopo Province.

1.4.1. Research objectives

- To assess the knowledge of patients living with HIV about the importance of viral load testing and their role in treatment follow-up at Eisleben clinic, Limpopo Province.
- To describe the perceptions of patients about the success of viral load testing in poor remote areas like Eisleben clinic.
- To determine contributory factors to delayed access to viral load testing and antiretroviral therapy (ART).

1.5. RESEARCH QUESTIONS

- What are the perceptions of patients about the success of viral load testing in poor remote areas like Eisleben clinic?
- What are the contributory factors to delayed access to viral load testing and antiretroviral therapy (ART)?
- What are the knowledge of patients on the availability of viral load testing and ARVs availability at Eisleben clinic?

1.6. RESEARCH METHODOLOGY

The methodology employed in the current study followed a qualitative research approach which was deemed fit for the study since the researcher wanted to explore Antiretroviral Therapy Availability and Equity of viral load testing for treatment follow-up at Eisleben clinic, Limpopo Province. Creswell (2013) states “that qualitative research methods are designed to help the researcher get a better understanding through first-hand experience, truthful reporting and quotations of actual conversations”. A more detailed approach to the study methodology is described further in Chapter three which focuses on research design; study site; population and sampling; data collection; data analysis; reliability and validity; and lastly how to minimise bias.

1.7. ETHICAL CONSIDERATIONS

As stipulated by De Vos *et al.*, (2011), all studies should be guided by acceptance, agreements, promises, mutual trust, cooperation and well-accepted prospects between all parties involved. Having done so the researcher shall have accordingly complied with the relevant ethical considerations. Ethics has to do with behaviour that is considered right or wrong. Ethics is an important consideration in research, particularly which involves humans and animals (Bertram & Christiansen 2014). Detailed ethical considerations for this study will be presented in Chapter three.

1.8. SIGNIFINACE OF THE STUDY

This study might assist generate data and comprehensive information on antiretroviral therapy availability and equity of viral load testing for treatment follow-up at Eisleben clinic, Limpopo Province. This study might also help in identifying the problems associated with viral load testing and the foundation for further studies, planning and interventions that are aimed at improving the quality of life of the people living with HIV. Therefore, the findings of this study might assist in providing information to manage the challenges associated with the availability and viral load testing. This study will also benefit the policymakers in the department of health.

CHAPTER 2: LITERATURE REVIEW

1.9. Antiretroviral therapy availability and equity of viral load testing for treatment follow up

The previous dealt with the introduction of the study. This chapter will review literature in line with the objectives of the study. Literature is reviewed from international, continental, regional and as well as local. De Vos, Strydom, Fouche and Delpont (2011) describe the purpose of literature is to provide to date understanding of the subject and identifying significant issues that can lead to further research especially where there is a gap in current knowledge. This means identifying gaps in existing knowledge and practice, articulating the weakness of the arguments of a particular approach or previous studies. This study explored the relevant literature on antiretroviral therapy availability and equity of viral load testing for treatment follow-up. The following databases were used for the review of literature: PubMed, Ovid. MEDLINE (Via Ovid), Web of Science, Science Direct, ProQuest, Scopus, Cochrane Library and Google Scholar. The topics reviewed in the study will be discussed in detail below. The following subheadings are discussed briefly below:

1.10. Global roll-out of antiretroviral therapy

The global emergency of HIV/AIDS has prompted unprecedented international attention and commitment to enhance access to HIV care, antiretroviral therapy (ART) rollout, and prevention (Jani, Abimiku, Ford & Katz, 2017). Many developing nations are presently establishing and scaling up extensive HIV care and antiretroviral therapy (ART) programs in order to preserve and enhance the lives of those infected and afflicted by the disease, as well as to minimize HIV transmission (WHO, 2018). In this environment, governments' ability to deliver and sustain effective long-term HIV care, including antiretroviral therapy (ART) and prevention, is important. Moreover, this necessitates a patient monitoring system that is integrated with the health facility's care, prevention, and treatment.

Measurement of important indicators and timely monitoring of the programme to be successful, critical indicators must be measured and rapidly fed back to

improve program activities. UNAIDS, (2014) posit that governments, international, bilateral, and non-governmental organizations have made a significant commitment to providing access to ART, which necessitates the development of clinical teams at numerous HIV care/ART sites. Creating a structure to support this care, both administratively and through training, supervision, clinical mentorship, and other quality assurance inputs following training, is equally vital (Roberts, Cohn, Bonner & Hargreaves, 2016). Therefore, the backbone of clinical care, treatment, and prevention is a patient monitoring system.

The 90–90–90 targets, agreed by the United Nations General Assembly in 2016, called for the vast majority of people living with HIV to be tested, start treatment and have the HIV within their bodies reduced to undetectable levels by 2020 (WHO, 2020). However, UNAIDS, (2014) states that achieving these targets means that a minimum of 73% of people living with HIV have suppressed viral loads, which helps to keep them healthy and prevents the further spread of the virus. Moreover, at the end of 2020, 84% of people living with HIV knew their HIV status, 73% were accessing antiretroviral therapy and 66% were virally suppressed (Jani, Abimiku, Ford & Katz, 2017). Among the 37.7 million people living with HIV globally in 2020, an estimated 27.5 million people living with HIV were on treatment—a number that has more than tripled since 2010, but that is still short of the 2020 target of 30 million (WHO, 2020). The global roll-out of HIV treatment has saved millions of lives: an estimated 16.5 million AIDS-related deaths have been averted since 2001. In 2020, there were 680 000 deaths from AIDS-related causes, a decline of 58% from 2001 to 2020 (WHO, 2020). At least 40 countries are on track to achieve a 90% reduction in AIDS-related mortality by 2030, including nine countries in eastern and southern Africa (UNAIDS, 2014).

Literatures indicates that there has been a rapid scale up in the provision of Antiretroviral therapy (ART) in Sub Saharan Africa in the last decade with more than 7.5 million people receiving treatment by the end of 2012 (UNAIDS, 2014; Roberts, Cohn, Bonner, Hargreaves, 2016 & World Health Organization, 2020), this comes hand in hand with increased access to HIV testing and therefore knowledge of HIV status. A large proportion of those with HIV in sub-Saharan

Africa are women of reproductive age who are routinely tested for HIV at antenatal care clinics (ANC) in order to try to prevent mother to child transmission and those testing positive are referred to clinics for treatment (WHO, 2020). According to Nel et al., (2020) postulate that the official estimates of national HIV prevalence by UNAIDS are currently based on trends observed in antenatal clinic surveillance and far more ANC data are becoming available due to routine reports from PMTCT programs. The researcher argues that ANC prevalence trends are then adjusted to match prevalence levels estimated from national population surveys. Part of this adjustment accounts for the reduced fertility of HIV positive women. However increased access to care and treatment services and uptake of antiretroviral therapy may impact on the fertility of HIV positive women for biological and behavioural reasons, implying a need to re-estimate the adjustment factors used in these calculations (WHO, 2020).

A scholar such as Cordie, and Esmat, (2020) argues that there have been no longitudinal studies in Sub-Saharan Africa that have looked at the population level impact of ART on fertility. However, a few studies have measured fertility or incidence of pregnancy in women on ART (Gaolathe, Wirth, Holme, Makhema, Moyo & Chakalisa., et al., 2016) but these lack suitable comparators (HIV negative women in the same community) and may not be representative of all HIV positive women (SeyedAlinaghi, Ghadimi, Hajiabdolbaghi, Rasoolinejad, Abbasian & Nezhad ., et al., 2020). A cross sectional comparison using Malawian Demographic and Health Survey data (DHS) found an increased probability of giving birth for HIV positive women relative to HIV negative women between 2004 and 2010 (World Health Organization, 2020) which is attributed to the increase in access to mother to child transmission and ART services in Malawi.

1.10.1. International advocacy to reduce the costs of treatment

The early reluctance to support ART for developing countries was driven by both public health caution and treatment cost (Ooms, & Hanefeld, 2019). The fact that antiretroviral medicines were priced beyond the reach of most people who needed them in Africa had long been an international concern: at the International AIDS Conference in Stockholm in 1988 there was debate about how to ensure people in the developing world could access the treatment of that

time - zidovudine monotherapy - which was marketed at a price of US\$8000 per year (WHO, 2020). Triple therapy, available in developed countries since late 1996, was considered far too expensive for resource-limited settings, and UN agencies (Forsythe, McGreevey, Whiteside, Shah, Cohen & Hecht., et al., 2019), academics and major donors alike all argued against providing treatment in favour of focusing funding on prevention (UNAIDS, 2014). As a consequence, many high-prevalence countries were slow to adopt national treatment plans.

The World Health Organization (2020) states that civil society groups, and in particular people living with HIV/AIDS, were crucial to breaking the deadlock. Patient groups in Thailand, Brazil, South Africa, India, Kenya, Uganda, and other high-burden countries formed alliances with health providers, non-governmental organizations, and health groups in developed countries to argue the case that the cost of treatment was too high (Ooms & Hanefeld, 2019). Activist demonstrations took place across the world from New York to Bangkok to raise attention about the global inequities in access to treatment (Forsythe et al., 2019). In 2002, a landmark legal case was to change the landscape. In South Africa, home to the largest number of people living with HIV/AIDS, the government fought (and arguably won) a court case against a consortium of 39 pharmaceutical companies over a law that would allow the government to source more affordable antiretrovirals from neighbouring countries (WHO, 2020). Thailand and Brazil also played a critical part. Both countries established public capacity to produce medicines at a fraction of the price demanded by multinational pharmaceutical companies (Forsythe et al., 2019).

Widespread access to affordable antiretrovirals became feasible after the announcement by an Indian generics' manufacturer in early 2001 that triple therapy could be manufactured for less than a dollar a day (UNAIDS, 2014). This established a dynamic of global market competition that in 10 years has brought down the price of standard triple therapy from \$US 10,000 per patient/year to almost \$US50 (Dutta, Barker, & Kallarakal, 2015). Today, over 80% of ART used in low-income and middle-income countries is purchased from Indian generics companies (World Health Organization, 2020). The dramatic reduction in the cost of treatment was essential to shifting the cost-effectiveness

equation, and from 2003 several international funding streams were established to support ART scale up, notably the Global Fund to Fight AIDS, Tuberculosis and Malaria and the US President's Emergency Plan for AIDS Relief (UNAIDS, 2014; Dore, Martinello, Alavi, & Grebely, 2020).

1.11. The roll-out of antiretroviral therapy in Africa

The World Health Organization, (2018) suggests that Sub-Saharan Africa remains the region worst affected by the HIV epidemic, accounting for more than two-thirds of the global HIV burden. Despite this, the region has seen substantial gains in the fight against HIV in recent years with the expansion of ART eligibility, and subsequent adoption of the World Health Organisation (WHO) recommended universal-test-and-treat (UTT) policy (UNAIDS, 2014; Abimiku, Ford & Katz, 2017). However, many health systems across Sub-Saharan Africa remain weak, under-resourced and overburdened (Roberts, Cohn, Bonner, & Hargreaves, 2016). Furthermore, The WHO, (2018) posit that many countries in the region faced challenges in meeting UNAIDS 90-90-90 HIV targets and fully realising the benefits of the UTT policy due to persistent health system deficiencies. South Africa (SA) bears the largest HIV burden in the region, with nearly eight million individuals living with HIV, and over four and a half million of these receiving ART in 2019. However, despite considerable efforts to scale-up access to treatment, an additional three million individuals need to start ART to reach 95% of HIV diagnosed patient on ART by 2030.

Since 2001, the international effort to scale up antiretroviral therapy (ART) in the developing world has been one of the most important programmes in global health (Saag et al., 2018). Initially, there was considerable reluctance to provide ART in developing countries, due to concerns that treatment was too expensive, too complex, and that drug resistance would be promoted by inadequate programmes (Calvaruso, Petta, & Craxi, 2018). It was argued that ART was not cost-effective and that prevention interventions should be prioritized (Eagle, Venter, & Rees, 2018). Despite these concerns, treatment programmes began to deliver ART at scale, and in less than a decade, more than five million people were successfully started on treatment. This remarkable progress was supported by a global coalition of doctors, patients, civil society actors, governments, and

non-governmental organizations, who refused to accept that millions of people could be consigned to an early death from a disease that in developed countries had been transformed into a chronic, manageable condition.

1.12. The roll-out of antiretroviral therapy in South Africa

South Africa's antiretroviral therapy (ART) program for the treatment of HIV infections was launched in 2004. At that time, 4.1 million adults had been living with HIV for 15 years and in a decade another 2.2 million adults had been infected with the virus. Treat patients and provide better care and treatment services. Since then, the ART program in South Africa has grown to become the largest in the world, with an estimated 4.2 million adults receiving ART in 2017. When the ART program in South Africa began, adults with ART counts CD4 <200 cells / mm³ had the right to initiate treatment (Takarinda et al., 2020). The CD4 limit was increased to 350 cells / mm³ in August 2011 and from January 2015 to 500 cells / mm³ (Dorward, et al. 2018). However, despite the expansion of eligibility criteria for ART, South Africa faced challenges in meeting the second target 90-90-90, which is to provide ART for 90% of HIV diagnoses, with only 56.9% of adults diagnosed with HIV nationwide in mid-2015. Level of ART received. In September 2016, the National Department of Health (NDoH) introduced Universal Test and Treat (UTT), which allowed all adults to start ART regardless of CD4 count (Kaplan, et al 2018) but ART coverage for adults only increased in 2017 at least 61% (Takarinda et al., 2020).

1.13. Knowledge of patients living with HIV about the importance of viral load testing

Report also calls for increased efforts to reach the 9.4 million people living with HIV who are not aware that they are living with the virus and the estimated 19.4 million people living with HIV who do not have a suppressed viral load (Msimango, Gibbs, Shoji, Ngobese, Humphries, Drain, Garrett & Dorward, 2020). The report, Knowledge is power, reveals that although the number of people living with HIV who are virally suppressed has risen by around 10 percentage points in the past three years, reaching 47% in 2017, 19.4 million people living with HIV still do not have a suppressed viral load (Takarinda, et al., 2020). To remain healthy and to prevent transmission, the virus needs to be

suppressed to undetectable or very low levels through sustained antiretroviral therapy. And to effectively monitor viral load, people living with HIV need access to viral load testing every 12 months. “Viral load testing is the gold standard in HIV treatment monitoring,” said Michel Sidibé, Executive Director of UNAIDS. “It shows that treatment is working, keeping people alive and well and keeping the virus firmly under control.” The report outlines that access to viral load testing is mixed. In some parts of the world, getting a viral load test is easy and is fully integrated into a person’s HIV treatment regime, but in other places there may be only one viral load machine for the entire country (Takarinda, et al. 2020).

Viral load testing is far more sensitive than CD4 tests: it is more likely to detect treatment failure early, providing an opportunity to undergo enhanced adherence support and conserve first-line regimens, or, if adherence problems are ruled out, to ensure prompt and correct switching to second- and third-line treatment regimens (WHO, 2021). Viral load testing is superior in diagnosing treatment failure, preventing unnecessary switching to more expensive second- or third-line treatments. A study conducted in six African countries found that almost half of patients who changed to a second-line regimen on the basis of only clinical or CD4 monitoring were switched unnecessarily (UNAIDS, 2014). A multi-country study conducted by Medicines Sans Frontières found that only 30% of people suspected of treatment failure had an elevated viral load, meaning that 70% might have been switched to second-line treatment unnecessarily if viral load was not used to confirm treatment failure (WHO, 2020).

1.14. The understanding of ART patients on their role in treatment follow-up

Taking HIV medicines keeps people with HIV healthy and prevents HIV transmission (Ford & Katz, 2017). Patients understanding of ART and their role in treatment follow-up is very crucial. Taking HIV medicines every day and exactly as prescribed (called medication adherence) also reduces the risk of drug resistance (Takarinda, et al., 2020). As HIV treatment continues to improve, people are less likely to have side effects from their HIV medicines (Roberts, Cohn, Bonner & Hargreaves, 2016). HIV medicines can interact with other HIV medicines in an HIV regimen or with other medicines a person is taking. Health

care providers carefully consider potential drug interactions before recommending an HIV regimen and support patients to know their role in treatment follow-ups (Johnson, Dorrington & Moolla, 2017).

Antiretroviral therapy (ART) is recommended for all people living with HIV, regardless of CD4 cell count, to consistently suppress viral load, maintain high CD4 cell counts, prevent AIDS, prolong survival, and reduce risk of transmitting HIV to others (Reif, Abrams, Arpadi, Elul, McNairy, Fitzgerald, & Kuhn, 2020). Research demonstrates that the success of ART, however, depends on the extent to which a patient takes his or her treatment according to the prescribed doses, dosing intervals, and other medication instructions (Algarin, et al., 2020 & Angelo, Alemayehu, 2021). Several studies have shown that health care providers can positively impact medication-taking behaviours among HIV-infected patients by engaging in regular, ongoing discussions at every office visit that describe the benefits of ART adherence; track clinical measures that are influenced by adherence, such as a viral load; identify barriers to adherence; offer adherence support services; and provide information on other interventions that can improve adherence and reduce the risk of HIV transmission to others (UNAIDS, 2014; Algarin, et al., 2020 & Angelo, Alemayehu, 2021).

Establishing ongoing brief conversations with patients in a supportive and non-judgmental way encourages trust and facilitates opportunities to identify teachable moments in which HIV care providers can better help patients achieve sustained viral suppression (UNAIDS, 2014; Algarin, et al., 2020 & Angelo, Alemayehu, 2021). For example, HIV care providers can communicate the benefits of adherence by explaining that with ART medications, patients can now expect to live longer lives if they adhere to their ART regimen exactly as prescribed. Patients entering care should also understand the potential negative consequences of non-adherence such as increased mortality and morbidity, drug resistance, and risk of transmitting HIV to others. Recent findings show that assessing a patient's ART readiness is the first step to successful ART adherence. 6 Patients starting ART should be willing and able to commit to treatment and understand the benefits and risks of therapy and the importance of adherence (UNAIDS, 2014; Algarin, et al., 2020 & Angelo, Alemayehu, 2021).

Before patients begin ART, health care providers can evaluate patient readiness to help identify predictors of suboptimal adherence (WHO, 2020).

Barriers to ART adherence may arise from a patient's personal or cultural beliefs, cognitive abilities, or health status, including comorbidities. A patient's capacity for treatment competence or regimen-specific barriers also may impact adherence, as well as psychosocial or structural issues such as poor mental health, drug use, or even lack of housing or health insurance. Brief conversations with patients can help HIV care providers identify and utilize teachable moments. Numerous studies show that through open discussion, HIV care providers and patients can uncover barriers, identify strategies, and set behavioural goals to improve adherence.

1.15. Barriers to access viral load testing

Previous research on barriers to retention to care has predominantly focused on barriers at the individual level that stems from both socioeconomic and psychosocial factors (Gesese, Ward, Woldemichael, & Mwanri, 2020). However, several factors also reflect individuals' life challenges and circumstances including among others food insecurity, low health literacy, homelessness, low education and poor dietary factors have been identified as major barriers to receive adequate treatment or care for HIV. Furthermore, the researcher is of the view that at the individual level, the negative impact of psychosocial barriers on HIV-related health outcomes has been evident in previous research, including factors as substance use mental illness, anxiety, perceived stress, depression hopelessness, avoidant coping and personality traits (Joseph et al, 2018).

Riley et al. (2019) posits that while viral load testing could prime to ultimate cost savings based on improved patient treatment outcomes, reductions in unnecessary regimen switches, and reduced transmission, budget planning for increased investment in the short term will be necessary to ensure that these costs do not become barriers to testing scale-up. Additionally, increased efforts to improve access to viral load testing should be accompanied by efforts to improve access to effective and affordable second line and third-line routines. The South

African Government should understand the full costs of integrating viral load testing into existing ART programmes to inform appropriate amounts of resource allocation towards not only testing supplies, but also strengthening of the supportive laboratory and clinical systems, and demand-generation initiatives, including patient and clinician education.

CHAPTER 3: RESEARCH METHODOLOGY

1.16. INTRODUCTION

The study adopted the qualitative research approach. The qualitative approach is used to seek understanding on the perspective or situation by looking at first-hand experience to provide meaningful in-depth data from a natural setting (Creswell & Poth 2016). This chapter will put emphasis on the research design, study site, population, inclusion and exclusion criteria, sampling, data collection, data analysis, reliability, bias and ethical considerations.

1.17. RESEARCH DESIGN

The study used qualitative approach and was guided by the exploratory and descriptive research design. Rubin and Babbie (2014) denote that exploratory research design is appropriate when undertaking studies where there is minimum research on the subject matter complemented by high levels of uncertainty, ignorance, and lack of adequate understanding. The approach was selected and deemed fit for the study since the researcher wanted to explore Antiretroviral Therapy Availability and Equity of viral load testing for treatment follow-up at Eisleben clinic, Limpopo Province. Creswell (2013) states “that qualitative research methods are designed to help the researcher get a better understanding through first-hand experience, truthful reporting and quotations of actual conversations”. Descriptive research design is that participants are observed in their natural setting where their natural environment is unchanged (Merriam & Grenier 2019). The study is descriptive, because it described the experiences and understanding and describe the views of the respondents with regard to their experiences of what are the determinants of immunological and virological failure whilst on ARVs. Key informant interviews are interviews that are conducted with people who have a special position in the target population and possess special knowledge that can shed more light on the problem that is being investigated (Creswell & Poth, 2016).

1.18. STUDY SITE

This study was conducted in Eisleben Clinic, in the Capricorn District under the Molemole municipality, Limpopo Province. Sepedi is the dominant language in the area and used by almost all the community members. Study setting refers to

the place and condition or circumstances where and within which the research study takes place (Pilot & Beck, 2012). This clinic it is under the care of the Department of Health.

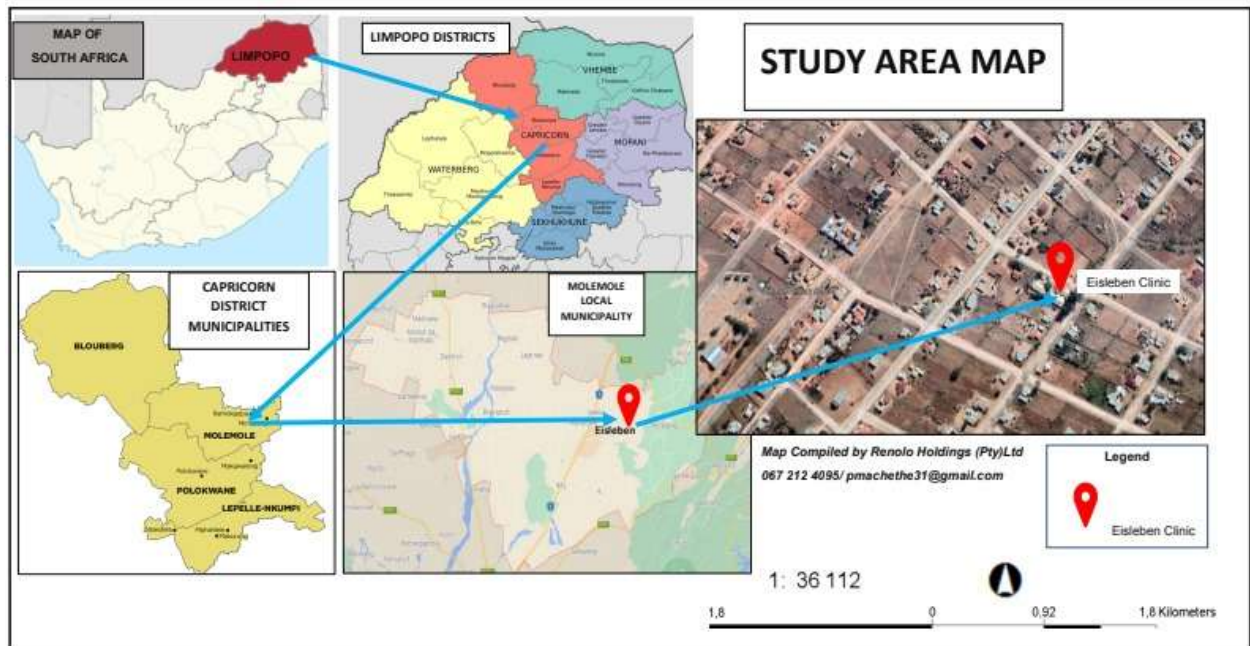


Figure 1: Maps showing Eisleben Clinic in Limpopo Province.

1.19. STUDY POPULATION AND SAMPLING

1.19.1. Population

The study population is a subset of the target population from which the sample is actually selected from (Creswell & Poth, 2016). According to Census (2018) population was estimated to be 18 485 people residing in the villages of Eisleben and Ramakgopa. The accessible population is composed of cases from the target population that are accessible to the researcher as study participants. It refers to the population as an aggregate or totality of all the objectives, or members that conform to a set of specifications (Polit & Beck, 2013). The population of this study include all patients who are on Antiretroviral Therapy and who access viral load testing at Eisleben clinic.

1.19.2. Sampling technique and sample size

Sampling is the process of selecting the subset or portion of the population to represent the identified population. (Clark, & Creswell, 2014). Sampling is the process of selecting a portion of the population to represent the entire population. A sample is a subset of the population element. A convenience,

purposive sampling method was adopted to select the participants. A purposive sampling of 20 participants was constituted.

1.19.3. Sampling of participants

Sampling method is the process of taking a portion of a universe or population as representative of that universe or population. Qualitative research requires smaller study samples, because information gathered may reach a point of saturation and not all participants may participate (Flick 2018). In the current study, participants were selected using a non-probability sampling method which is purposive sampling (Creswell & Poth, 2016) based on the nature of the study and the researcher judgement guided by the objectives of the study. The study focus was on participants who are on antiretroviral therapy and who are 18 years and above irrespective of gender. Purposive sampling allows the selection of participants according to the needs of the study aimed at clearly bringing out the phenomena under study based on the researcher's decision (Rubin & Babbie, 2014).

1.19.4. Sampling size determination

The researcher intended to interview 11 participants and data saturation was reached on the participant number nine (9), and no new information was coming from the participants therefore, the researcher stopped interviewing participants.

1.19.5. Inclusion Criteria

Nine (9) participants who were on antiretroviral therapy programme at Eisleben clinic, Limpopo Province, age 18 years and above during the conduct of the study were included to participate in the current study.

1.19.6. Exclusion Criteria

Participants who did not give consent to participate in the current study were excluded and those who were not mentally fit were also excluded to take part in the current study.

1.20. Data collection

Data collection refers to the gathering of information needed to address a research problem (Pilot & Beck 2004). Face to face interviews were used as the main data collection technique in the current study. The use of open-ended and flexible questions allowed interviews to provide rich detailed and in-depth information, developed rapport and trust, verbal and non-verbal data generated consistent quantifiable data (Flick, 2014). The researcher chose this method because interviews limit bias and ensure that participants understand the nature and content of the questions and are therefore able to give relevant and appropriate information that was useful to the researcher. Since the topic related to viral load testing and is largely viewed as sensitive and private, the physical presence of the interviewer combined with a safe environment such as a boardroom had a positive effect on promoting the accuracy of the data obtained. This data collection method was most suited for this study because it propagated reliable results due to transferability and conformability by not manipulating the study instruments, keeping them the same while conducting the study in its natural settings (Patton, 2002). A recording device and field notes were used to ensure that all data was recorded and safe for analysis.

3.5.1 Data collection tool

Face to face interviews were used as the main data collection technique in the current study. The use of open-ended and flexible questions allowed interviews to provide rich detailed and in-depth information, developed rapport and trust, verbal and non-verbal data generated consistent quantifiable data (Flick, 2014).

3.6. Data analysis

The Thematic Content Analysis (TCA) was used for data analysis purposes. According to Flick (2018) thematic content analysis is the most common form of analysis in qualitative research, which emphasizes pinpointing, examining and recording of patterns or themes within data. In this study, the researcher was guided by the thematic data analysis phases outlined by Friese, Sorata and Pires (2018). Based on this, the data analysis phases were done as follows:

- Step 1: Becoming familiar with the data

The researcher collected data, transcribed audio, read through the text and take initial notes,

- Step 2: Generation of initial codes

The researcher highlighted sections of our text such as phrases and sentences,

- Step 3: Searching for themes

The researcher looked for connections between emerging themes and grouped them together according to conceptual similarities, providing each cluster with a descriptive label,

- Step 4: Reviewing the themes

The researcher made sure that the themes are useful and accurate representations of the data,

- Step 5: Defining and naming themes

The researcher formulated exactly what they meant by each theme and figured out how it helps understand the data,

- Step 6: Producing the report

The results or findings section addresses each theme in return. Second coder was solicited to find out if they also arrive at the same findings and to identify places where codes were not sufficiently defined.

3.7. Measures to ensure trustworthiness

Trustworthiness refers to the extent to which a research study is worth giving attention to and worth taking note of. It also refers to the degree to which others are convinced that the findings are to be trusted (Creswell & Poth 2016). In this study the use of the second coder was used to ensure trustworthiness. Mohajan (2018) denotes that trustworthiness in research has four epistemological standards attached to it, namely credibility, transferability, dependability and conformability.

3.7.1. Credibility

Credibility refers to the extent to which those who read a research report can believe and accept the research findings to be true. According to Creswell and Poth (2016) prolonged engagement with the subject matter is essential in establishing credibility, since it builds trust and a rapport with the participants where rich information can be obtained. The researcher ensured credibility through engaging participants during the 45 min in-depth interviews and key informant interviews.

3.7.2. Conformability

Rubin and Babbie (2014) denote that conformability entails the research process and results are free from prejudice. The researcher ensured that as far as possible the study's results are objective and are not based upon biases, motives and perspectives of the researcher. In this study conformability was demonstrated by audio taping of data to be transcribed.

3.7.3. Dependability

To enable dependability, the researcher provided a detailed account on how data would be collected, including in the research design executed during the study and ensure that data is correctly recorded (Flick, 2018).

3.7.4. Transferability

Transferability refers to the degree to which the results of qualitative research can be generalized or transferred to other contexts or settings Rubin and Babbie (2014).

3.8. Ethical considerations

The researcher presented the proposal to the departmental review process for approval. After approval at departmental level, the proposal served at the school and Faculty of Health Sciences Higher Degree Committee. The approval letter from the Faculty was used to apply for the ethical clearance from University of Limpopo Research Ethics Committee the Turfloop Research Ethics Committee (TREC) reference number: TREC/377/2022: PG.

3.8.1. Permission to conduct the study

Permission to conduct the study was requested from the Limpopo Department of Health. Once granted the researcher seek permission from the Capricorn District and healthcare facilities. The local facility manager was informed about the study and permission to gain access the participants.

3.8.2. Confidentiality and anonymity

To ensure anonymity and confidentiality, steps were taken to protect the identity of the participants by neither giving their names when presenting research results, nor including their identifying details such as workplace, personal characteristics, and occupation. The interview guides were also not carrying their actual names.

3.8.3. Informed consent

The researcher gave the participants the informed consent form and allows them to read and understand the contents of the consent form. The researcher also provided a detailed explanation to the participants about the study and what is expected from them. Once those processes have been satisfied, the participants will be requested to sign a consent form that is translated in their language as proof of participation in the study. The participants were informed that their participation in the study is voluntary and that they can withdraw from the study at any stage

3.8.4. Avoidance of harm

Creswell and Poth (2016) describe harm in research as potential risks of or negative physical, psychological, social, legal and economic outcomes as a result of participation in the conducted study. It is important that researchers protect and secure the wellbeing of the participants to avoid harm, be it physical, emotional, social or spiritual, during data collection. Participants might experience emotional breakdowns during the discussions. The researcher will make arrangements with the healthcare facility to provide counselling for participants.

3.8.5. Measure to minimise bias

Creswell and Poth (2016) indicate that bias is an influence in the research project which distorts the quality of the results or findings. Bias can occur by intention and unintentional. These can be in a form of interviewer bias whereby the interviewer can affect the participants' responses through the characteristics of the interviewer such as aggressiveness or being passive. In the current study, interviewer bias was minimised by making sure that the same set of interview questions were used for every interviewee and this ensured a level of consistency between interviewees. Confirmation bias was minimised by continuously and always re-evaluating impressions of participants and challenged pre-existing assumptions during data collection.

3.9. Summary of the chapter

The study adopted the qualitative research approach. The qualitative approach was used to seek understanding on the perspective or situation by looking at first-hand experience to provide meaningful in-depth data from a natural setting (Creswell & Poth 2016). This chapter has put emphasis on the research design, study site, population, inclusion and exclusion criteria, sampling, data collection, data analysis, reliability, bias and ethical considerations.

CHAPTER 4: PRESENTATION AND DISCUSSION OF THE RESULTS

1.21. Introduction

The purpose of this chapter is to present, analyse and interpret empirical findings from data collected on the Antiretroviral Therapy Availability and Equity of viral load testing for treatment follow-up at Eisleben clinic, Limpopo Province. The term 'participant' is used as a replacement for real names of individuals participating in this study. Biographical information of participants will be given so that their socio-cultural context can be understood. In addition, several global and local literature was studied to gain an understanding of the Antiretroviral Therapy Availability and Equity of viral load testing for treatment follow-up. The study employed a qualitative approach which is descriptive in nature. A case study design was employed to allow the researcher the opportunity to collect data and to assimilate results in the interpretation stage. The researcher used Thematic Content Analysis to organise and manage data.

In an attempt to seek a solution to the research problem, the researcher constituted a sample of nine (9) participants who were purposefully selected for the purpose of the study. The selection criteria involved participants who are on antiretroviral therapy both male and female were included in the study to determine the availability and equity of viral load testing for treatment follow-up at Eisleben clinic, Limpopo Province. The researcher collected data until the saturation point was reached. Data collection was done through face-to-face interviews. The entire data collection process lasted for 5 days. Audio recorded interviews were transcribed. Themes that emerged during the interviews were discussed in terms of the framework underpinning the study.

1.22. DEMOGRAPHIC CHARACTERISTICS OF THE PARTICIPANTS

Table 1 below presents demographic details of the sample of 9 participants who took part in the study at Eisleben clinic, Limpopo Province. Most participants spoke Setswana and Sepedi, but every participant was allowed to express themselves in any language they wished. Participants' ages ranged from 37 to 62

years. From the nine participants, five were males and four were females. Majority of participants their religious affiliation was Christianity. All the nine participants were on ARV treatment with an average duration ranging from two years to seven years.

Participants	Religious Affiliation	Age	Number of years on ARV
Participant 1	Christianity	52	6 Years
Participant 2	African T Religion	48	2 Years
Participant 3	Christianity	39	7 Years
Participant 4	Christianity	46	3 Years
Participant 5	Christianity	38	7 Years
Participant 6	Christianity	54	5 Years
Participant 7	Christianity	44	2 Year 6 month
Participant 8	African T Religion	37	6 Years
Participant 9	Christianity	48	3 Years

1.23. FINDINGS, ANALYSIS AND DISCUSSION

The data gathered by the researcher was analysed by means of coding, or data reduction and arranged into themes. An audio recorder was used in data collection after consent to do so was obtained from participants. The results from the study are the understanding of factors that controls viral load suppression which have the following subthemes: Knowledge of people living with HIV on the importance of treatment adherence, the understanding of people living HIV on the importance of disclosure, knowledge of people living with HIV on the practices the practices that assist in viral load suppression and knowledge of people living with HIV on the importance of viral load testing. The second theme that emerged was the barriers to access the viral load testing which came with the three subthemes which are patient Low Socio economic circumstances, patient health related factors and patients experience on the availability of ART treatment.

Table 2: Themes and sub-themes.

Main Themes	Sub-themes
1. There is understanding of factors that controls viral load suppression	1.1 Knowledge of people living with HIV on the importance of treatment adherence 1.2 The understanding of people living HIV on the importance of disclosure. 1.3. Knowledge of people living with HIV on the practices the practices that assist in viral load suppression 1.4. Knowledge of people living with HIV on the importance of viral load testing
2. Barriers to access viral load testing	2.1. Patient Low Socio economic circumstances 2.2. Patient health related factors 2.3. Patients experience on the availability of ART treatment

1.23.1. *Theme 1: The understanding of factors that controls viral load suppression*

1.23.1.1. Subtheme 1: Knowledge of people living with HIV on the importance of treatment adherence

This study shows that there is lack of sufficient knowledge on the factors that controls viral load suppression on patient who are taking ART. Some highlighted that the clinicians who are offering the treatment in the clinics need to explain and teach them to increase knowledge of the factors that controls the viral load suppression. Participants expressed some of their challenges below:

Participant 2: *'The nurses give us treatment without explaining full details of how we are progressing,*

sometimes when you ask them questions they tell you that they will explain on the next follow-up date.'

Patients have less knowledge with regard to their health conditions while they are on the ART treatment due to nurse's failure to make time to educate them.

Participant 3: *'For me what matters is to have treatment that I can drink on a daily basis, and i am unable to differentiate the difference between the CD4 count and the Viral load blood. As long as I collect my treatment and drink am okay.'*

It has been observed that shortage of staff in Eisleben clinic contributes to lack of health education to inform the patients about their health status.

Participant 6: *'Yes is just that I don't know the difference between blood tests, the other thing is that when they collect blood they want to know if you taking the treatment correctly and your immune systems allows you to continue drinking the current treatment or they should change the treatment.'*

Amongst adult patients in the region, various barriers to ART adherence have been identified: fear of HIV status disclosure, HIV-related stigma, alcohol use and drug abuse, forgetfulness, complicated ART regimens, pill burden, side effects, transportation costs, and financial constraints. In one study in South Africa, Peltzer et al. found that determinants for adult nonadherence to ART included poor environment, experiences of HIV-related discrimination, and use of herbal medicine (Stephanie H, 2016).

1.23.1.2. The understanding of people living with HIV on the importance of disclosure.

The findings show differences in the understanding of the importance of HIV status disclosure where some participants indicated that they find it hard to disclose to family members about their HIV status because the fear of stigma in the families. But other participants showed an understanding on the effects of not disclosing their statuses.

Participant 1: *'I think informing my children about my status helped me a lot because I am free to take my treatment in front of them and they even remind me when it is 20H00 the nights that maybe I forget to take my treatment. They even remind me to carry my treatment when I am going to attend funerals of relatives far from home.'*

Another participant supported the previous statement by highlighting that when you disclose your status you start to live a free life than the ones hiding their statuses

Participate 7: *'In my whole life I never lived on the people standards, the day I knew my status I told my wife and encouraged her to go and test. I told her my status but having a space in my mind that she may blame me but at the end of the day I will live my life freely.'*

Some participants show lack of understanding of disclosure of their HIV status to their partners and families.

Participant 2: *'I will never tell my children's father about my status, he works in Gauteng and if I disclose my status to him he will think that I am cheating on him when he is away. I know him very well he is very insecure. Even my children will never disclose to them because I fear that if I tell them my status everybody in the family will know.'*

This statement was supported by another participant who is afraid to lose close friends due to her being HIV positive.

Participant 9: *'Me and my friends we talk a lot about people who are on ARVs and we talk about their status in a negative way, so I will never disclose to them about my status because that will be the end of our friendship.'*

1.23.1.3. The knowledge of people living with HIV on the practices that assist in viral load suppression

The findings of the study shows that majority of participants don't know that their lifestyle practices plays a major role in their viral load suppression, they further reported that they didn't see any problem living their life like everyone else in the world either HIV positive or negative.

Participant 5: *'To tell you the truth I personally don't think I should limit myself in living the life that I love just because I am HIV positive, I continue to live like everyone else in the family. I discovered few weeks back that if I am on ART I must not drink herbals that we use in the family as part of our cultural belief, and truly speaking this will be hard for me.'*

Participant 7: *'Sister look you know that it is not easy for someone to adjust her lifestyle, like in my case I am married and I cannot tell my husband to start using condom because we are both HIV positive.'*

Participant 9: *'Some nurses tell us about the things that we can do to be virally suppressed, like for example not practicing voluntary vomiting, or drinking our cultural herbs while on ARVs. But when you face it alone at*

home, it is not easy to stop activities that you are used to do.'

1.23.1.4. Subtheme 4: The knowledge of people living with HIV on the importance of viral load testing

The findings of this study show that the participants have an insight when it comes to the importance of viral load monitoring. Most of them seems to be happy to know the outcomes for drinking their treatment.

Participant 02: *'They take blood for viral load in order to check if I am taking my treatment correctly. And after taking the blood on the following month I am able to ask the nurses about my blood results.'*

Participant 06: *'Yes is just that I don't know the difference between blood tests, the other thing is that when they collect blood they want to know if you taking the treatment correctly and your immune systems allows you to continue drinking the current treatment or they should change the treatment.'*

Another participant supported by mentioning that monitoring of viral load is crucial because the results can help to rule out if there is a need for treatment adjustment.

Participant 08: *'Yes they are going to check the blood and see if there is a need to add other treatment or give you another treatment if the virus is high.'*

Viral load testing is far more sensitive than CD4 tests: it is more likely to detect treatment failure early, providing an opportunity to undergo enhanced adherence support and conserve first-line regimens, or, if adherence problems are ruled out, to ensure prompt and correct switching to second-and third-line treatment regimens (WHO, 2021). Viral load testing is superior in diagnosing treatment failure,

preventing unnecessary switching to more expensive second- or third-line treatments. A study conducted in six African countries found that almost half of patients who changed to a second-line regimen on the basis of only clinical or CD4 monitoring were switched unnecessarily (UNAIDS, 2014). A multi-country study conducted by Medicines Sans Frontiers found that only 30% of people suspected of treatment failure had an elevated viral load, meaning that 70% might have been switched to second-line treatment unnecessarily if viral load was not used to confirm treatment failure (WHO, 2020).

1.23.2. *Theme 2: Barriers to access viral load testing*

The study found that barriers to access viral load testing were identified at all levels, health system, community level and patient level. The participants living with HIV reported low socio-economic circumstances, stigma, fear of protection in terms of confidentiality breach and insufficient counselling as a major barrier to access viral load testing at Eisleben Clinic.

1.23.2.1. *Subtheme 1: Low socio-economic circumstance*

The researcher found that majority of patients who are collecting their ART are the residents of Eisleben village and the village is too small so the economic circumstance is not a problem. The only patients who are affected are the ones who stays in the farms.

Participant 1: *'I stay and work in the farm so I encountered problems when it comes to travelling to Eisleben clinic, I pay a lot of money to reach the clinic even though this is the closest health facility for me. If possible, can you please inform the department of health management to at least offer us all the ART services in our farms through mobile clinics, I think that will benefit me a lot financially.'*

Another participant added that the clinic is very close to her home so she doesn't need any transport to access the healthcare.

Participant 8: *'I am not staying far from the clinic so for me it is a walking distance to reach the clinic and it doesn't cost me any cent.'*

Several factors also reflect individuals' life challenges and circumstances including among others food insecurity, low health literacy, homelessness, low education and poor dietary factors have been identified as major barriers to receive adequate treatment or care for HIV (Gesese, 2020).

1.23.2.2. Subtheme 2: Patient health related factors

This study indicated that the literacy level, culture and beliefs of patients plays a major role when coming to patients understanding of their own health conditions and they are all barriers for accessing viral load testing.

Participant 4: *'Sometimes I miss my blood monitoring month because I will be far away from home helping with the Sangoma's initiations in the mountains. But the healthcare providers do contact me on my phone to remind me and you find that it is not possible for me to come back home until we finalize those initiation processes in the mountains.'*

The next participant supported by mentioning that being literate is very important because you can be able to manage your appointment dates.

Participant 5: *'For me a barrier to access the viral load testing on my cohort is that I rely on my children to remind me of my month because I easily forget and I didn't go to school, you know how our parents operated in the old days hey.'*

1.23.2.3. Patients experience on the availability of ART treatment

Participant 1: *'Since I started using this current treatment I am encountering a problem with the medications that I take. The nurses hardly give me a 2 months' supply like the previous days. Now they can give me a 2 weeks supply and when I ask they tell me it is a new drug and it is scarce in the province. This problem keeps on happening and I end up failing to attend other life issues because I visit the clinic more often.'*

Participant 5: *'I think Eisleben clinic is still the best when it comes to service delivery. They always have the equipment's to collect blood for viral load testing, for me I don't remember having issues in this clinic. I always get help when it is needed.'*

The findings of the study show that the availability of treatment is not an issue at Eisleben Clinic.

Participant 8: *'I would like to pass my gratitude to the Eisleben nurses for making sure that we always find our treatment, big up for making enough treatment orders for us. I used to collect my treatment in a certain clinic and the stock was always out of stock but with Eisleben clinic I never experienced any problem.'*

A study on barriers to retention to care has predominantly focused on barriers at the individual level that stems from both socioeconomic and psychosocial factors (Gesese, Ward, Woldemichael, & Mwanri, 2020). However, several factors also reflect individuals' life challenges and circumstances including among others food insecurity, low health literacy, homelessness, low education, and poor dietary factors have been identified as major barriers to receive adequate treatment or care for HIV. Furthermore, the researcher is of the view that at the individual level, the negative impact of psychosocial barriers on HIV-related health outcomes has been evident in previous research, including factors as substance use mental illness, anxiety,

perceived stress, depression hopelessness, avoidant coping, and personality traits (Joseph et al., 2018).

CHAPTER 5: SUMMARY, CONCLUSION, LIMITATIONS AND RECOMMENDATIONS

1.24. INTRODUCTION

The aim of the study was to determine the Antiretroviral Therapy availability of viral load testing for treatment follow-up at Eisleben Clinic. This chapter summarises the findings and discussions made, gives conclusions about the experiences of the people who are living with HIV and getting their ART services at Eisleben Clinic.

1.25. SUMMARY OF THE FINDINGS

The study employed the qualitative approach, which is descriptive in nature. The researcher used a Thematic Content Analysis to organise and manage data. The first theme focused on the understanding of factors that controls viral load suppression. Under this theme, the following subthemes were discussed:

1.25.1. Knowledge of people living with HIV on the importance of treatment adherence

This study shows that there is lack of sufficient knowledge on the factors that controls viral load suppression on patient who are taking ART. Some highlighted that the clinicians who are offering the treatment in the clinics need to explain and teach them to increase knowledge of the factors that controls the viral load suppression. It has been observed that shortage of staff in Eisleben clinic contributes to lack of health education to inform the patients about their health status. Participants have less knowledge with regard to their health conditions while they are on the ART treatment due to nurse's failure to make time to educate them.

1.25.2. *The understanding of people living HIV on the importance of disclosure.*

The findings show differences in the understanding of the importance of HIV status disclosure where some participants indicated that they find it hard to disclose to family members about their HIV status because the fear of stigma in the families. But other participants showed an understanding on the effects of not disclosing their statuses.

Another participant supported the previous statement by highlighting that when you disclose your status you start to live a free life than the ones hiding their statuses. This findings correspond with WHO (2015) who mentioned the importance of disclosure, People who disclose their HIV status may receive social support and experience reduced stigma, which may in turn lead to other positive outcomes for them, their partners and their families, such as engagement in HIV prevention services (including prevention of mother-to-child transmission [PMTCT]) and uptake of and adherence to HIV care and treatment services. Disclosure to sexual partners could also increase rates of HIV testing and reduce transmission risk behaviours, including increasing the use of antiretroviral treatment or pre-exposure prophylaxis (PrEP) to prevent HIV transmission in sero-discordant couples.

1.25.3. *Knowledge of people living with HIV on the practices that assist in viral load suppression*

The findings of the study shows that majority of participants don't know that their lifestyle practices plays a major role in their viral load suppression, they further reported that they didn't see any problem living their life like everyone else in the world either HIV positive or negative. (WHO, 2018) highlighted the importance of Viral suppression, one component of the Joint United Nations Programme on HIV/AIDS (UNAIDS) goal to end the HIV/AIDS epidemic by 2030, is that 95% of all persons receiving antiretroviral therapy (ART) achieve viral suppression. The individual and population-level benefits of ART are well understood. Persons receiving ART who achieve and sustain an undetectable viral load do not transmit HIV to their sex partners, thereby disrupting onward transmission. Viral load testing is a cost-effective and sustainable

programmatic approach for monitoring treatment success, allowing reduced frequency of health care visits for patients who are virally suppressed. Viral load monitoring enables early and accurate detection of treatment failure before immunologic decline.

1.25.4. Knowledge of people living with HIV on the importance of viral load testing

The findings of this study shows that the participants have an insight when it comes to the importance of viral load monitoring. Most of them seems to be happy to know the outcomes for drinking their treatment. The majority of people in low-resourced areas and poor backgrounds do not have access to viral load testing. As of 2019, a total of 7.6 million people were living with HIV in South Africa – 4.8 million women, 2.5 million men and 300 000 children (Johnson, Dorrington, & Moolla, 2017).

The second theme: Barriers to access viral load testing and the subthemes are as follows, The study found that barriers to access viral load testing were identified at all levels, health system, community level and patient level. The participants living with HIV reported low socio-economic circumstances, stigma, fear of protection in terms of confidentiality breach and insufficient counselling as a major barrier to access viral load testing at Eisleben Clinic.

1.25.5. Patient Low Socio economic circumstances

The researcher found that majority of patients who are collecting their ART are the residents of Eisleben village and the village is too small so the economic circumstance is not a problem. The only patients who are affected are the ones who stays in the farms.

1.25.6. Patient health related factors

This study indicated that the literacy level, culture and beliefs of patients plays a major role when coming to patients understanding of their own health conditions and they are all barriers for accessing viral load testing.

1.25.7. *Patients experience on the availability of ART treatment*

The findings of the study show that the availability of treatment is not an issue at Eisleben Clinic. Findings revealed that the clinicians order enough stock for the patients.

1.26. Conclusion

Generally, the availability of Antiretroviral Therapy of viral load testing for the treatment follow-up at Eisleben clinic reported in this study was satisfactory, but more attention needs to be given to health care workers to improve in offering more information and knowledge about the importance of lifestyle modification while on ART.

1.27. Limitations

The participant's literacy level was a challenge because they were unable to differentiate between blood for CD4 count and blood for Viral load. Lack of knowledge of participants on their health condition and how it is monitored.

1.28. Recommendations

The recommendations of the study are based on various issues that emerged from the study findings and suggestions made by the key informants interviewed. The proposed recommendations are as follows:

- The healthcare providers offering health services should offer health education on specific health conditions not generalise the health education.
- The healthcare providers should continue with the adherence counselling
- The healthcare providers should encourage disclosure of HIV status

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Appendices

Appendix A Consent Form

I MOKGEHLE BELINDA MOKGADI, I am an MPH student from the University of Limpopo researching the Antiretroviral Therapy availability and equity of viral load testing for treatment follow-up at Eisleben clinic, Limpopo Province. The following is information about the study so that you can make an informed decision.

1. AIM OF THE STUDY

The aim of this study is to determine Antiretroviral Therapy Availability and equity of viral load testing for treatment follow-up at Eisleben Clinic, Limpopo Province.

2. PROCEDURE

Participation in this study is voluntary. You have the choice to discontinue the interview at any stage should you feel uncomfortable without providing any reason.

- You have the right to choose the place of the interview within the village where confidentiality will be possible.
- With your permission, the interview will take 15-20 minutes long.
- The interview will be audio- recorded.

3. CONFIDENTIALITY

All information, including your identity and responses in this interview, will be kept confidential and only used for research. All audio-recorded materials, transcripts of the interview and completed interview schedules will be safely stored where it cannot be accessed by unauthorised users in a computer which is password protected. All materials will then be stored in a storeroom at a safe place prohibiting all people, including the researcher and the study leader, from having access to the materials.

The researcher will maintain anonymity as far as possible during the research process.

4. DECEPTION OF RESPONDENTS

You as the participant will be briefed about the aim of the research and no information will be withheld from you in order to allow you to make an informed decision regarding your participation in the research and to ensure that there is no deception.

5. BENEFITS AND RISKS

- The information gained from the research can assist everyone in for the purpose of the aim of the study

6. COSTS

There will be no cost to you as a result of your participation in this study.

7. PAYMENT

You will receive no payment for participation. You are welcome to ask any questions to the researcher before you decide to give consent. You are also welcome to contact me as a student or my study leader if you have any further questions concerning your participation in the study.

8. VOLUNTEER STATEMENT

I agree that the procedures and processes of the interview have been clearly explained to me; that my identity and responses will be kept private and confidential; and that I may choose to discontinue the interview at any stage should I feel uncomfortable without providing any reason. I also consent that the interview is audio recorded digitally and electronically so that data provided be analysed and findings of the study reported for research purposes. This is the only place where your name will appear otherwise you can mark with an "X".

Name of ParticipantSignature of Participant.....

APPENDIX B: TUMELELO YA GO TSEA KAROLO DINYAKISISONG

Ke nna MOKGEHLE BELINDA MOKGADI, ke moithuti wa Masters in Public Health ko University ya Limpopo. Nna ke dira dinyakisiso ka ditirelo tseo di leng gona mabapi le kalafi ya HIV mo tabeng ya go tsewa madi a Viral Load mo Kliniking ya Eisleben, Profenseng ya Limpopo. Tshedimoso ye e latelago ke ya botlalo mabapi le dinyakisiso tse. Se se le fa boikgethelo bja o tsea sephetho sa goba karolo ya dinyakisiso tse goba boikgethelo bja o se tsee karolo.

1. Maikemisetso a dinyakisiso

Maikemisetso a dinyakisiso tse ke go laetsa ditirelo tseo di lego gona mabapi le ditirelo tsa kalafi ya HIV mo tabeng ya go tsewa madi a Viral load go balwetsi ba HIV mo Eisleben Clinic, Limpopo Profense.

2. Tshepediso

Go tsea karolo ya dinyakisiso tse ke boithaopo ga se kgapeletso. Le nale boikgethelo bja go kgaotsa go tsea karolo dipoledisanong tse mo kगतong efe le efe yeo e dirago gore le ikwe e se la lokologa ge le fana ka tshedimoso ntle le go fa mabaka.

- Le nale tokelo ya go ikgethela lefelo leo re ka direlang dipoledisano tse, gona mo Eisleben go boloka sephiri sa lena.
- Go ya ka tumelelo ya lena, dipoledisano tse di ka tsea botelele bja metsotso e 15 goya go metsotso e 20.
- Dipoledisano tse di tlo dirwa kgatiso ya mantsu.

3. Polokego ya sephiri

Tshedimoso kamokago akaretswa boitsebiso le dikarabo tsa dipoledisano tse di tlo bolokwa bjale ka sephiri, di tlo shomiswa fela mo dinyakisisong tse. Dikgatiso tsa mantsu kamoka, sengwalwa sa dipotsiso le dikarabo di tlo bolokwa gabotse mo lefelong la polokego la tshireletso. Ditshomiswa kamoka di tlo bolokwa lefelong la polokego mo go sa fihlelelego batho, go akaretswa le monyakisisi le bahlahli ba

gagwe. Monyakisisi o tlo hlokomela go se tsebjwe ga batsea karolo mo dinyakisisong tse.

4. BOFORA BJA BAKGATHATEMA

Lena jwale ka mokgathatema mo dinyakisisong tse le tlo fiwa tshedimoso ka ga maikemisetso magolo a dinyakisiso tse. Le tlo abelwa tshedimoso kabotlalo gore le kgone go tsea sephetho mabapi le go tsea karolo ntle le bofore.

5. MEHOLA LE DIKOTSI

- Tshedimoso yeo e tlong go hwetswa mo dinyakisisong tse di tlo kgola batho bohle go ya ka morero wa mogolo wa dinyakisiso. Mo di nyakisisong tse ga ona dikotsi.

6. DITSHENYAGALELO

Ga ona ditshenyagalelo go bakgathatema ba go tsea karolo mo dinyakisiso tse.

7. DITEFELO

Go tsea karolo mo dinyakisisong tse ke boithaopo ga ona ditefelo. Le dumeletswe go ka botsisa dipotsiso gore le hwetse tshedimoso yua maleba pele le ka saina lengwalo la tumelelano.

8. POLELO YA BOITHAOPHI

Nna jwale ka mokgathatema ke dumelelana le tshepediso ya dinyakisiso tse, ke filwe tshedimoso ka botlalo. Ebile ke tsebisitswe gore maina aka a tla bolokwa jwale ka sephiri. Ke tsebisitswe le goreke dumeletswe go ka emisa ka dinyakisiso legatong lefe goba lefe ge ke ikwa ke sa lokooga. Ke ba file tumelo ya o gatisa mantsu.

Ye ke karolo e le nnosi mo lebisto la lena le ka tswelago. Le dumeletswe go ka berekisa leswao la "X" ge le ekwa le sa lokologen go ka ngwala leina.

Lebitso.....Mosaeno.....

APPENDIX C: DATA COLLECTION TOOL; SEMI-STRUCTURED INTERVIEW

Research topic: Antiretroviral therapy availability and equity of viral load testing for treatment follow-up at Eisleben clinic, Limpopo province

SECTION A: DEMOGRAPHIC DATA OF PARTICIPANTS

1. Age:
2. Educational level:
3. Employment status:
4. Number of children
5. Religious affiliation

SECTION A: TO ASSESS THE UNDERSTANDING OF PATIENTS ON THE FACTORS THAT CONTROLS VIRAL LOAD SUPPRESSION

1. According to you, do you think adherence of treatment is important? Yes/No, please motivate.
2. What is the importance of disclosing the HIV status?
3. What are the practices that can assist in viral load suppression?
4. What is the importance of viral load testing?

SECTION B: BARRIERS TO ACCESS VIRAL LOAD TESTING

5. What are the barriers that prevents or delays you to access the viral load testing?
6. What is your experience on the availability of ART treatment at Eisleben clinic?

Thank you for participating.

APPENDIX D: SESHOMISWA SA GO KGOBOKETSA TSHEDIMOSO

TABA KGOLO: GO BA GONA GA DITIRELO TSA KALAFI YA HIV TABENG YA GO TSEA MADI A VIRAL LOAD MO EISLEBEN CLINIC, LIMPOPO PROVINCE

DEMOGRAPHIC DETAILS:

1. Mengwaga
2. Dithuto
3. Bana
4. Ditumelo
5. Lenyalo

KAROLO YA MATHOMO: TEKOLO YA TSEBO YA BALWETSI MABAPI LE DIKA TSEO DI LAOLANG GO LAOLEGA GA KOKWANA YA VIRAL LOAD

1. Go ya ka lena le bona go le bohlokwa go latela tshepediso ya go nwa diokobatsi tse? Ee/Aowa, fahlela ka mabaka.
2. Bohlokwa bja go tsebisa meloko goba metswalle ka seemo sa lena sa maphelo ke bofe?
3. Go ya ka lena le bona ele eng seo se ka dirwang go thusa gore Viral load e fokotsege mo mmeleng wa molwetsi?
4. Bohlokwa bja go tseiwa madi a Viral load ke bofe?

KAROLO B: DITSHITISO TSA GO HWETSA DITIRELO TSA GO LEKOLWA MADI A VIRAL LOAD

5. Ke ditshitiswa dife tseo di le thibelago goba tseo di le ditelago go hwetsa ditirelo tsa go tsewa madi a viral load?
6. Ke maitemogelo afe ao le naleng ona mo kabelong y meriana ya di ARV mo Eisleben clinic?

Ke rata go le leboga ge le dumetse go tsea karolo mo dinyakisisong tse,

APPENDIX E: PERMISSION TO CONDUCT A STUDY DEPARTMENT OF HEALTH, LIMPOPO PROVINCE

P O Box 73545

Blood River

0699

The senior manager Department of health

Private Bag X 9302

Polokwane

0700

Dear sir/Madam

REQUEST FOR PERMISSION TO CONDUCT A RESEARCH STUDY

I am a student at the University of Limpopo (UL) currently registered for a Master's degree in public health. I hereby request permission to conduct a research study at the Eisleben clinic. The study is entitled: Antiretroviral Therapy Availability and Equity of viral load testing for treatment follow-up at Eisleben clinic, Limpopo Province.

Thank you in anticipation of a positive response and for the efforts to be taken to assist me in this regard.

Best Regards,

Belinda Mokgadi

Email: Mokgadibm422@gmail.com

Cell: 0764395416

APPENDIX F: PERMISSION TO CONDUCT A STUDY DEPARTMENT OF HEALTH, LIMPOPO PROVINCE



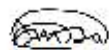
University of Limpopo
Department of Research Administration and Development
Private Bag X1106, Sovenga, 0727, South Africa
Tel: (015) 268 3935, Fax: (015) 268 2306, Email: anastasia.ngobe@ul.ac.za

TURFLOOP RESEARCH ETHICS COMMITTEE
ETHICS CLEARANCE CERTIFICATE

MEETING: 22 August 2022
PROJECT NUMBER: TREC/377/2022: PG

PROJECT:

Title: Antiretroviral therapy availability and equity of viral load testing for treatment follow-up at Eisleben clinic, Limpopo.
Researcher: BM Mokgehle
Supervisor: Prof E Maimela
Co-Supervisor/s: Ms MP Maphakela
School: Health Care Sciences
Degree: Master of Public Health



PROF D MAPOSA
CHAIRPERSON: TURFLOOP RESEARCH ETHICS COMMITTEE

The Turfloop Research Ethics Committee (TREC) is registered with the National Health Research Ethics Council, Registration Number: REC-0310111-031

Note:

- i) This Ethics Clearance Certificate will be valid for one (1) year, as from the abovementioned date. Application for annual renewal (or annual review) need to be received by TREC one month before lapse of this period.
- ii) Should any departure be contemplated from the research procedure as approved, the researcher(s) must re-submit the protocol to the committee, together with the Application for Amendment form.
- iii) PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES.

APPENDIX G: PERMISSION TO CONDUCT A STUDY PROVINCIAL DEPARTMENT OF HEALTH, LIMPOPO PROVINCE



LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

Department of Health

Ref : LP_2022-09-013
Enquires : Ms PF Mahlokwane
Tel : 015-293 6028
Email : Phoebe.Mahlokwane@dhsd.limpopo.gov.za

BELINDA MOKGADI MOKGEHLE

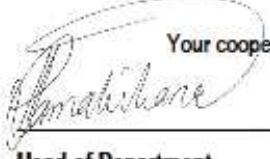
PERMISSION TO CONDUCT RESEARCH IN DEPARTMENTAL FACILITIES

Your Study Topic as indicated below;

ANTIRETROVIRAL THERAPY AVAILABILITY AND EQUITY OF VIRAL LOAD TESTING FOR TREATMENT FOLLOW-UP AT EISLEBEN CLINIC, LIMPOPO PROVINCE

1. Permission to conduct research study as per your research proposal is hereby Granted.
2. Kindly note the following:
 - a. Present this letter of permission to the Office District Executive Manager a week before the study is conducted.
 - b. This permission is **ONLY** for Eisleben Clinic in Capricorn District
 - c. In the course of your study, there should be no action that disrupts the routine services, or incur any cost on the Department.
 - d. After completion of study, it is mandatory that the findings should be submitted to the Department to serve as a resource.
 - e. The researcher should be prepared to assist in the interpretation and implementation of the study recommendation where possible.
 - f. **The approval is only valid for a 1-year period.**
 - g. If the proposal has been amended, a new approval should be sought from the Department of Health
 - h. Kindly note that, the Department can withdraw the approval at any time.

Your cooperation will be highly appreciated


pp **Head of Department**

24/10/2022

Date

Private Bag X9302 Polokwane
Fidel Castro Ruz House, 18 College Street, Polokwane 0700. Tel: 015 293 6000/12. Fax: 015 293 6211.
Website: <http://www.limpopo.gov.za>

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**APPENDIX H: PERMISSION TO CONDUCT A STUDY FROM CAPRICORN
DISTRICT DEPARTMENT OF HEALTH, LIMPOPO PROVINCE**

04/11/2008



LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF
HEALTH

REF : S.5/3/1/2
ENO : Mokgohloa KA
TEL : 015 290/9096

FROM : DISTRICT EXECUTIVE MANAGER
TO : BELINDA MOKGADI MOKGEHLE

SUBJECT : PERMISSION TO CONDUCT RESEARCH ON ANTIRETROVIRAL THERAPY
AVAILABILITY AND EQUITY OF VIRAL LOAD TESTING FOR TREATMENT FOLLOW-UP AT EISLEBEN
CLINIC, LIMPOPO PROVINCE

The above matter refers:-

1. Permission to conduct the above study at Capricorn District Health institutions/facilities is hereby granted.
2. Kindly be informed that:
 - In the course of your study there should be no action that disrupts the services.
 - After completion of the Situational Analysis, it is mandatory that the findings should be submitted to the Department to serve as a resource.
 - The researcher should be prepared to assist in the interpretation and implementation of the study recommendation where possible.
 - Kindly note that the Department can withdraw the approval at any time.
3. Your cooperation will be highly appreciated.


DISTRICT EXECUTIVE MANAGER

04/11/2008
DATE

APPENDIX I: INDEPENDENT CODER CERTIFICATE

CO-CODER'S REPORT

To whom it may concern.

RE: CO-CODING CONFIRMATION:

This letter serves to acknowledge that I **PAMELA MAMOGOBO**, have co-coded Nine transcripts for **BELINDA MOKGADI MOKGEHLE (201922658)** titled: **ANTIRETROVIRAL THERAPY AVAILABILITY AND EQUITY OF VIRAL LOAD TESTING FOR TREATMENT FOLLOW-UP AT EISLEBEN CLINIC, LIMPOPO PROVINCE.**

The Two themes and Seven sub-themes that emerged from the analysed transcribed data were agreed upon between myself and Ms Belinda Mokgadi Mokgehle.

For any enquiries please contact me:

Dr P. Mamogobo

University of Limpopo: Student Health and Wellness Centre

Cell: 0791343285

Tel: (015) 268 2386

E-mail: pamela.mamogobo@ul.ac.za



30/11/2022

Signature

Date

APPENDIX J: LANGUAGE EDITOR CERTIFICATE



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Date: 08 December 2022

To Whom it May Concern

I hereby confirm that I have proof-read the document entitled: "Antiretroviral therapy availability and equity of viral load testing for treatment follow-up at Eisleben clinic, Limpopo" authored by student Mokgehele BM with student number 201922658. I have suggested a number of changes which the student may, or may not, accept, at her discretion and the supervisor.

Each of us has our own unique voice as far as both spoken and written language is concerned. In my role as proof-reader I try not to let my own "written voice" overshadow the voice of the author, while at the same time attempting to ensure a readable document.

Please refer any queries to me.

A handwritten signature in black ink, appearing to read 'A. Scholtz', written over a light grey background.

Andrew Scholtz