



**THE IMPACT OF COVID-19 ON HIV PATIENTS WHO ARE ON ART IN VHEMBE DISTRICT,
LIMPOPO PROVINCE, SOUTH AFRICA**

BY

Moyo Ramasela Anna
Student Number: 9606520

**A dissertation submitted in fulfilment of the requirement
for the degree
of**

MASTER OF ARTS

UNIVERSITY OF VENDA

Supervisor

Prof A Maphula

Co-Supervisor

Prof L Makhado

Year: August 2025

© University of Venda

DECLARATION

I, Ramasela Anna Moyo, declare that the research study entitled “**The impact of COVID-19 on HIV patients who are on ART in Vhembe district, Limpopo Province, South Africa**” is my own work and that this work has never been submitted before for any other degree at this university or any other institution and all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

Moyo RA.

Ms Moyo RA

Date: August 2025

PREFACE

This dissertation is presented in article format and is comprised of three sections: Section A presents the overview of the study including introduction, methodology and ethical considerations, Section B is a presentation of two manuscripts with the journal authors guidelines, and Section C presents the study conclusion, limitations, and recommendations. The dissertation is outlined in the following manner:

Section A: Dissertation Overview

This section provides the overview that details the background, problem statement, purpose and objectives of this study, research design and methods and the ethical considerations. Literature review has not been included in the dissertation as extensive literature has been systematically reviewed in the first manuscript.

Section B: Paper/Article/Manuscript

This section has a total of two manuscripts:

- The first manuscript is titled “The impact of COVID-19 on ART adherence in HIV positive adults in South Africa: A systematic review.”
- The second manuscript is titled, “The impact of COVID-19 on HIV patients who are on ART in Vhembe district, Limpopo Province, South Africa.”

Section C: Conclusion, Recommendations and Dissertation Limitations

This last section presents conclusions from this dissertation and makes dynamic recommendations. At the same time, the study limitations are reflected in all that was presented within each section and is informed by the whole research process.

ACKNOWLEDGEMENTS

I would like to sincerely convey my gratitude to the Almighty God who has given me this opportunity to study and for seeing me through the study until the end; sincere gratitude is further extended to the following people for their support and contribution throughout the study:

- My supervisor, Prof A Maphula, for her patience, consistent guidance and opportunities which enhanced this study.
- Prof L Makhado, my co-supervisor, for being a good teacher who imparted knowledge and countless opportunities to explore and experience the research world.
- Mrs TM Moyo , my mother, for the ongoing support, encouragement and unconditional love.
- My children Tebogo, Maita and Shandukani, for been so amazing and understanding. I am grateful to be blessed with them.
- The University of Venda for funding part of my study.
- The Department of health, their staff members at Makhado and Bhungeni health centres who assisted greatly and made this study possible by offering permission to use their facilities; and granted access to the patients.
- All the PLWHV who participated in the study, for whom without their cooperation the study would not have been possible.
- My employer, the Department of Health for allowing me time off for studies.
- My mentors and colleagues for their unweaving support; and to students who formed part of the project, thank you for the assistance and encouragement.

DEDICATION

This study is dedicated to:

- ✓ *My mother, Maishi Tryphina Nankhoma Moyo for her unwavering love and support, she has always been a pillar of strength and encouragement for me, I am who I am today because of you.*
- ✓ *My late brother, Madimetja Itlhaganeleng Lucas Sebueng, who passed on just before he could graduate for his LLB degree. His encouragement and support will forever be cherished as it contributed significantly to my success. This is for him and he will always be in my heart.*
- ✓ *My children, Tebogo, Maita and Shandukani for being understanding and patient with me during my studies. Your beautiful smiles kept me going. I thank the Almighty God for blessing me with you.*
- ✓ *To my siblings, Mokgadi, Kedibone, Beatrice and Koketjo for your love, support and prayers. Thank you .*

TABLE OF CONTENTS

Contents

DECLARATION	i
PREFACE	ii
ACKNOWLEDGEMENTS.....	iii
DEDICATION	iv
TABLE OF CONTENTS	v
ABSTRACT	vii
OVERVIEW OF THE STUDY	viii
1.1 INTRODUCTION AND BACKGROUND	1
1.2 CONCEPTUAL FRAMEWORK	4
1.3 PROBLEM STATEMENT	5
1.4 RATIONALE FOR THE STUDY	6
1.5 AIM AND OBJECTIVES OF THE STUDY	6
1.5.1 Aim	6
1.5.2 Objectives	7
1.5.3 Hypotheses	7
1.6 SIGNIFICANCE OF THE STUDY	7
1.7 DEFINITIONS OF TERMS.....	7
1.8 RESEARCH METHODOLOGY	8
1.8.1 Research design	8
1.8.2 Study setting	9
1.8.3 Study population and sample	10
1.8.3.1 Target population	11
1.8.3.2 Sample and sampling	11
1.8.4 Inclusion and exclusion criteria	13
1.8.5 Data collection	12
1.8.6 The instrument	13
1.8.7 Validity and reliability	14

1.8.7.1 Validity of the instrument	14
1.8.7.2 Reliability.....	14
1.8.8 Pilot study	13
1.8.9 Data management and analysis.....	14
1.9 ETHICAL CONSIDERATIONS	14
1.9.1 Confidentiality	14
1.9.2 Right to anonymity	15
1.9.3 Privacy	15
1.9.4 Informed consent	15
1.9.5 Voluntary participation	15
1.9.6 Protection of respondents from any harm.....	17
1.10 DELIMITATION.....	17
1.11 PLAN FOR DISSEMINATION AND IMPLEMENTATION OF RESULTS.....	17
1.12 REFERENCES	16
SECTION 2	24
MANUSCRIPTS	24
2.1 Author Guidelines for African Journal of AIDS Research	25
Confirmation of Manuscript Submission	28
2.2 Manuscript 1.....	29
2.3 Author Guidelines for South African Journal of Psychology	62
2.4 Manuscript 2.....	64
SECTION 3: CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS	100
ANNEXURE A: ETHICAL CLEARANCE	104
ANNEXURE B: DEPARTMENT OF HEALTH APPROVAL LETTER LIMPOPO PROVINCE	106
ANNEXURE C1: INFORMATION SHEET	107
ANNEXURE C2: INFORMED CONSENT	110
ANNEXURE D: QUESTIONNAIRE /SURVEY	111
ANNEXURE D: TURNITIN	116
ANNEXURE E: EDITORS LETTER.....	117

ABSTRACT

Background: People who had mental health conditions before, may be more susceptible to stressors related to Coronavirus disease-2019 (COVID-19). Understanding the impact, in particular psychosocial impact of the pandemic for people living with HIV (PLWH) is critical, as they are to an extent, already at a risk for common mental disorders such as depression and anxiety, due to the fact that poor mental health may precede negative human immunodeficiency virus (HIV) related outcomes. The study assesses the impact of COVID-19 on HIV patients who are on antiretroviral therapy (ART) at 2 health centres at local municipality in Vhembe district.

Methods: The study incorporated a systematic review article due to the article format of the submission but the main study was quantitative in nature, using a descriptive design that is cross-sectional in nature. Simple random sampling was used in this study to select the sample of respondents who were PLWH, who met the criteria of being on ART treatment from the Limpopo department of health. Data was collected using a questionnaire which incorporated the following scales: Self-Reported HIV Medication Adherence, Fear of COVID Scale and PROMIS 10. The questionnaire was presented and administered to PLWH who are 18 years old and above who are on ART and have been residing in selected local municipality for the previous 12 months. Ethical considerations were observed throughout the study, participants gave full consent verbally and in writing prior data collection. Furthermore consent and approvals were obtained to ensure adherence to good ethical conduct.

Results: The Statistical Package of Social Sciences was used to analyse data. The findings highlight a substantial 34,4% of respondents being afraid of COVID-19 and 14,1 also agreeing, implying the almost half of the respondents experiences anxiety. 47.1% reported being afraid to die COVID-19 and 35.2% struggling to sleep due to worrying about COVID-19. Although the PROMIS 10 scale reflect 64.4% and quality of life was reported to be high, the COPE scale highlight 2,8% used alcohol and drugs to cope, 3,5% used binge eating to cope. The majority reported more positive adaptive ways to cope such as eating healthy, taking break from social media, exercising and connecting with other people. The t-test result showed that there is no association between gender and the levels of anxiety, irritability and depression, gender – females ($M = 11.1869$, $SD = 8.6411$) were not significantly different in level of irritability, anxiety and depression $t(285) = 0.527$, $P < .599$ compared males ($M = 10.7813$, $SD = 8.0366$). The result implies that gender has no significant influence on anxiety, irritability and depression. Hypothesis three was rejected. The health system implementors in SA need to classify psychological treatment as essential to be as swiftly as general health response to improve the health and wellbeing for PLWH during COVID-19.

Key words: ART, COVID-19, HIV, PLWH, South Africa

OVERVIEW OF THE STUDY

1.1 INTRODUCTION AND BACKGROUND

In Western Washington in January 2020, there was a report of the country's first COVID-19 case. After the World Health Organization's declared that COVID-19 was a global pandemic in March 2020, Washington State, in the United States of America (USA) quickly put in place a variety of social isolation measures. Since then, the COVID-19 epidemic has exposed social and health disparities all around the world, especially in Washington State. Numerous reports that have been made public show that COVID-19 has disproportionately affected vulnerable groups like people of color, the homeless, and other outcast groups (Waterfield & Shah, 2021). According to prior research these same populations are thought to be the most afflicted by and susceptible to HIV (Smith, 2021). At the same time, a growing body of research suggests that, in comparison to the general population, those with pre-existing mental health issues may be more vulnerable to stressors related to COVID-19 (Smith, 2021). As a result, it is imperative to develop a better understanding of the psychosocial effects of COVID-19 for people living with HIV (PLWH), as these individuals are to an extent already at risk of common mental disorders like depression and anxiety. Poor mental health is frequently a predictor of substance use, poor treatment adherence, and adverse HIV-related outcomes (Waterfield and Shah, 2021).

COVID-19 has led to an unexpected interruption of peoples' lives and health care across the world. Al Dhaheri, Bataineh, Mohamad, Ajab, Al Marzouqi, Jarrar and Al Sabbah (2021) argued that COVID-19 affected HIV treatment because of stay-home orders. According to Sun, Hou, Chen, Lu, Brown and Operio (2020), in China PLWH, who were already affected by stigma, negative psychosocial conditions and sub-optimal adherence, experienced critical challenges and difficulties to optimal health care as a result of COVID-19. Olufadewa, Oduguwa, Adesina, Ibiang, Eke, Adewumi and Adeyelu (2021) acknowledged that COVID-19 is disrupting HIV services around the Southern African Development Community (SADC) region, and that could lead to an additional 500000 AIDS related deaths. A review of literature by Prabhu, Poongulali and Kumarasamy (2020) found that HIV care delivery has been negatively affected by Coronavirus pandemic. The same view is shared by Shi, Tang, Hu, Qui, Marley, Liu, Chen and Fu (2021), whose study revealed that Coronavirus disease negatively impacted the HIV health care systems in China.

According to Weissman, Alameh, de Silva, Collini, Hornsby, Brown and Santra (2021) COVID-19 and associated restrictive measures and health care barriers in China seem detrimental to the well-being of PLWH. The study by Dorward, Khubone, Gate, Ngobese, Sookrajh, Mkhize and Baisley (2021) indicates that in Africa, the impact of HIV services during COVID-19 era is of particular concern because many loss of lives are attributed to HIV, with more than 400 000 deaths reported in the continent in 2019. Despite the importance of research in providing evidence based clinical interventions, Al Dhaheri et al. (2021) argued that COVID-19 affected HIV research due to additional decline in funding on HIV prevention, treatment, care and interventions.

Scientific evidence suggests that COVID-19 has affected most sectors of societies. It is argued that the pandemic may have exerted mental health effects on adults living with HIV in the sense that it might have exacerbated anxieties related to potential infection with the virus (Joska, Andersen, Rabie, Marais, Ndwandwa, Wilson and Sikkema (2020). Although social distancing guidelines serve to benefit the physical health of the population, these guidelines may be harmful to the social and emotional health of people (Al Dhaheri et al., 2021). Echoing the same view, Chenneville, Gabbidon, Hanson, and Holyfield (2020) in their work on the impact of COVID-19 on HIV treatment and research found that fear of COVID-19 can worsen the existing mental health issues among PLWH.

A scoping analysis that was released in May 2021 found that fewer than 8% of the research that examined the effects of COVID-19 on PLWH was qualitative or quantitative and that over 70% of the studies examined clinical outcomes (Waterfield, 2021). Understanding the social effects of the pandemic; and how the mental health of PLWH was influenced by service delivery disruptions, socio-economic worries, and the implementation of social distancing rules is equally as significant as, if not more so than these contributions (Waterfield, 2021).

To address this gap in knowledge, the researcher aims to do a quantitative study to explore the impact of COVID-19 on HIV patients who are on ART in Vhembe district, Limpopo Province, South Africa. Additionally, to unfold how the pandemic affected daily life. The study also aims to find variables that shielded people from anxiety and depressive symptoms. Findings from this study can guide future research and service delivery from a strengths-based and resilient approach, and they will add to the growing body of information about stress and coping during the epidemic.

Background of the study

The first cluster of flu-like symptoms associated with coronavirus was reported by the People's Republic of China in December 2019. In January 21, 2020, Washington State in the USA reported the first case of COVID-19, which the World Health Organization (WHO) later classified as a global pandemic on the 1st of March of that same year (World Health Organization, 2020). In order to battle the pandemic, the United States established social isolation policies in order to slow the virus' spread and make sure hospitals didn't overbook their beds. Social distancing was one of the most popular non-pharmaceutical interventions against COVID-19 at the time. However, it has also been demonstrated that this intervention has widespread detrimental impacts on mental health (Slaughter, 2021).

Notably, the pandemic's detrimental impacts on mental wellbeing are crucial for those living with HIV (PLWH). According to recent studies the chance of hospitalization and death from COVID-19 is equal for PLWH with suppressed HIV viral levels and the general population; however, COVID-19 stress may make it harder for

PLWH to effectively engage in care (Esteves, Oliveira and Argimon, 2021). Esteves et al., (2021) further noted that PLWH are susceptible to psychological and financial pressures, and HIV care professionals are concerned about the potential end-result of COVID-19 stress on patient treatment and results. There is in particular a worry that poor adherence to antiretroviral therapy (ART) due to COVID-19-related stress may result in viral levels that are not suppressed (Cortez, Joseph, Das , Bhandari and Shoib, 2020).

COVID-19 is seen as a traumatic event since it has disrupted regular life; and stressors associated with the COVID-19 pandemic are now more widely understood to have negative health effects (Slaughter, 2021). Numerous reasons; including the loss of a loved one, the worry of contracting Coronavirus disease, social isolation stress, job loss, housing difficulties and a lower quality of life can add to COVID-19 stress (Slaughter, 2021). Post-traumatic stress disorder (PTSD), guilt, anxiety, sadness, and depressive symptoms are just a few of the reactions to traumatic situations that people may experience. There is evidence that these psychosocial deficits lead to lower drug compliance (Esteves et al., 2021).

COVID-19 led countries across the globe to deploy drastic different measures to combat it, including the prevention of social gatherings, physical contact, and visits amongst people to reduce its transmission (Lu, 2020). There was collaboration at regional level on the African continent to reduce the transmission of COVID-19 (Gehre, Lagu, Achol, Katende, May & Affara , 2021). For example, the East African community invested in the creation of a Regional Electronic Cargo and the Drivers Electronic Tracking System to monitor COVID-19 cases across borders, and strict lockdown was implemented (Tikkanen, Roosa, Williams & Reginald, 2020).

The Sub-Saharan Africa used aggressive enforcement of COVID-19 rules. For example, it is estimated that over 70000 people were arrested for breaking rules and the government used drones to take photos of unlicensed gathering in Uganda (Muzyamba, Makova & Mushibi (2021). Sub-Saharan Africa (SSA) effected strict measures despite being the most affected region with HIV. Over 25.6 million people are currently living with HIV in SSA, accounting for a larger ration of the recent overall world HIV infections, and more than 70 percent of all AIDS and related deaths (Amuche, Emmanuel & Innocent, 2017). According to Binagwaho and Mathewos (2020) South Africa is one of the countries around the world to implement the strictest lockdown, which commenced in March 27 2020. The lockdown was applied to everyone including people with chronic conditions, and to those with compromised immune systems(Tikkanen et al., 2020).

The preceding measures were implemented despite revelations in the study by Pillay-van Wyk, Msemburi, Dorrington, Laubscher, Groenewald & Bradshaw (2019) of 7.97 million South Africans living with HIV. A study by Hogan, Jewell, Sherrard-Smith, Vesga, Watson, Whittaker, ... & Hallett (2020) revealed that the greatest impact of COVID-19 on HIV was estimated to occur as a result of an interruption to antiretroviral therapy, which could occur during the time of high health system demand. The above finding raises a lot of questions such as whether PLWH continued to receive all the necessary support and help during COVID-19 pandemic. The answer remains hidden in obscurity; hence the purpose of this study will be to investigate the

impact of COVID-19 on HIV patients who are on ART in Vhembe district.

1.2 CONCEPTUAL FRAMEWORK

This study is based on the Biopsychosocial model (BPS) which was developed by the American Psychiatrist George Engel in the late 1970s, in an attempt to encompass the psychological experiences of the patients, and the social or cultural context to comprehensively understand disease, illness and health (Hatala, 2012). In this model George Engel postulates that understanding chronic illness and disease as complex interaction between biological, psychological and social factors will allow clinicians to design interventions that will improve health outcomes Okonji, Van Wyk and Mukumbang (2022). The BPS refers to the idea that biological, psychological and social processes are interwoven and almost equally involved in the physical illness and health of patients, their medical diagnosis, medical treatment and their recovery (Suls, Luger & Martin, 2010). It would be inadequate for this study to only focus on the physical illness of the PLWH, their treatment and to the effects of COVID-19 on their wellbeing to the neglect of their experiences on their psychological and social levels in the sense that a change in one domain or level will result in change in other domains as outlined in Chenneville, Gabbidon, Hanson, and Holyfield (2020); Suls et al. (2010). The BPS alerts the practitioners, reseachers and policy makers to the need for multiple levels of analysis and appreciation of all domains that contribute to the problem and its solution (Suls et al., 2010).

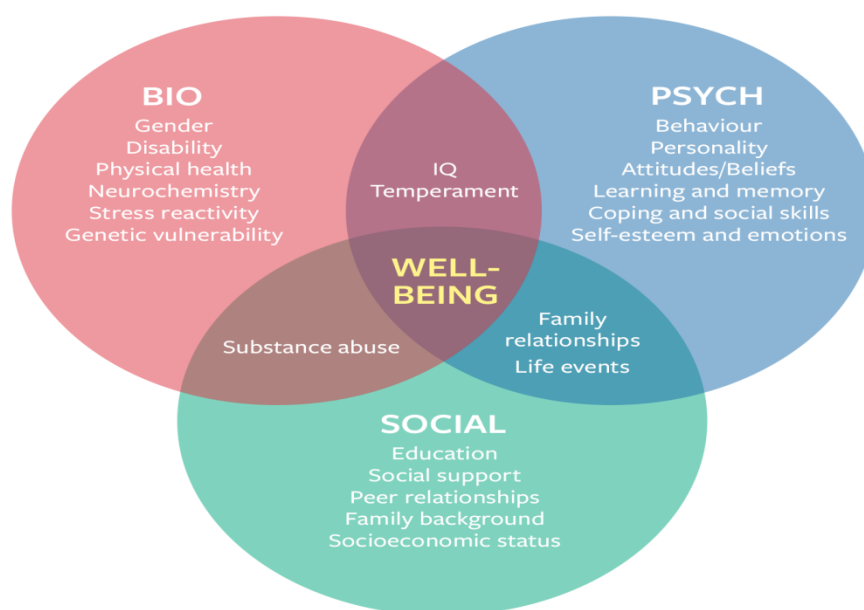


Figure 1.1 Diagram of BPS showing the linkage of the biological, psychological and social factors. (Source: www.bing.com/images)

Prior the outbreak of COVID-19, PLWH were already affected by chronic stress, depression, social isolation and conscientiousness (Sun, Hou, Chen, Lu, Brown & Operario, 2020). The interplay between COVID-19 with its stringent guidelines which intensified existing challenges in the communities and the management of HIV

patients who are on treatment, their lifestyle and health beliefs, family relationships, social support and socioeconomic status may affect the perceptions of the PLWH on their condition; and will more likely play a role in the vulnerability to or protection from both HIV and COVID-19 (Sun et al., 2020). Thus the BPS model is suitable to contextualise a discourse of the impact of COVID-19 on PLWH in Makhado municipality, because it would be beneficial to go beyond biomedical management of both conditions to achieve favourable health outcomes in this rural and semi-rural setting.

1.3 PROBLEM STATEMENT

Statistics South Africa (2019 & 2021) revealed that more than 7.5 million South Africans are living with HIV. Musetha (2016) reported that Vhembe district has 15 percent of PLWH in Limpopo province; and despite these figures, the number of people who had access to HIV services has reportedly been decreasing over the past one and half years compared to other previous years. For instance, a survey of programmes supported by the Global Fund to fight HIV in 106 countries, showed that service delivery disruptions resulting from COVID-19 pandemic have affected 85% of HIV programmes (International AIDS Society, 2021). Furthermore, a research done in SA, acknowledged that retention and prescription of pre-exposure prophylaxis for pregnant and post-partum women (PrEP-PP), a key prevention strategy for infant HIV transmission, was significantly reduced during the national COVID-19 lockdown (Essien, Mgbere, Iloanusi, & Abughosh, 2021). A study by Anne (2021) on the impact of COVID-19 control measures on HIV services in KwaZulu-Natal revealed that 18,519 scheduled visits to collect ART per week were recorded before lockdown; and after lockdown and this number decreased to 17,863 per week.

Such interruptions to HIV care delivery and access may potentially lead to imbalance of previous gains made in HIV control in Africa. The sentiment is also echoed by Msomi (2020) who is of the view that SA could miss its HIV treatment and prevention goals as a result of COVID-19. This situation should urgently be addressed. Thus, this study was carried out to investigate the impact of COVID-19 on people living with HIV who are on ART in selected local municipality in Vhembe district, Limpopo province. Since 2020, various studies have been conducted on the impact of COVID-19 and these studies have revealed that COVID-19 affected education, economy, mental health, and health delivery services (Schlicher, 2020; Roy, 2020 & Denergi, 2020). Despite the existence of scientific research on the impact of COVID-19 on various sectors of societies globally, there are no studies to date to the researcher's knowledge that investigated the impact of COVID-19 on people living with HIV in Vhembe district in Limpopo, SA, despite the country's reputation of implementing one of the strictest lockdowns worldwide (Binagwaho & Mathewos, 2020).

Similar to what happened with the HIV epidemic, COVID-19 has had an impact on people's mental health and psychosocial well-being. The public is still unaware of the spread and effects of COVID-19, despite the government and health ministry's efforts to educate people about preventative and treatment options through the

media. The social perceptions of COVID-19 and HIV/AIDS are incorrect (Escandón et al., 2021). Both physical and psychological stress are experienced by those who are afflicted with HIV/AIDS and COVID-19. Loss of income and lack of vital supplies resulted in despair for PLWH, anxiety, stress and worry about their survival (Mothi, Lala, and Tappuni, 2021). This study aim to comprehend the difficulties that HIV-positive people encountered during the COVID-19 era.

The deleterious effects of Coronavirus are more detrimental to HIV-positive individuals who simultaneously have other underlying comorbidities. Those who may test positive for both HIV and COVID-19 may become even more marginalized as a result of the increased psychosocial difficulties brought on by stress, isolation, and encountering new barriers to care. Therefore, it becomes crucial during epidemic to address these difficulties and hurdles so that PLWH can retain continuity of care as well as their social and mental support systems (Waterfield, Shah, Etheredg and Ikhile, 2021). These considerations are what motivated the researcher to conduct this study to examine the impact that COVID- 19 has had on HIV-positive individuals. Additionally, Statistics South Africa (2019) revealed that more than 7.5 million South Africans are living with HIV yet the impact of COVID-19 on people with HIV remains unknown. Consequently, the silence by academics on how COVID-19 has impacted PLWH may result in the government of SA implementing COVID-19 interventions from an uninformed position, thus this study was carried out to investigate the impact of COVID-19 on people living with HIV who are on ART in a selected municipality, Vhembe district, Limpopo province.

1.4 RATIONALE FOR THE STUDY

Numerous studies have been conducted on the impact of COVID-19 by Arndt et al, (2020); Bagula, Maluleke, Ajayi, Bagula and Bagula (2020) and Shi, et al (2021). Further studies that focused on COVID-19 impact were conducted in China and other countries outside South Africa, and those that have been done in SA focused more on how the economy has been affected by COVID-19 thus neglecting one of the most vulnerable population to COVID-19, PLWH (WHO, 2020). The story of the impact of COVID-19 on PLWH has not been comprehensively studied since the start of COVID-19. Thus, addressing the gap may more likely reduce the mortality rate among PLWH during the COVID-19 period. It might also assist policy makers to implement research-based interventions that are HIV-sensitive during the lockdown. The new knowledge may help non-state actors to advocate the rights of PLWH during the COVID-19 pandemic period. Furthermore, emerging issues may assist academics to carry out more studies.

1.5 AIM AND OBJECTIVES OF THE STUDY

1.5.1 Aim

This study aims to investigate the impact of COVID-19 on HIV patients who are on ART at local health centres

in Vhembe district, Limpopo Province.

1.5.2 Objectives

The following objectives guided the study:

Systematic Review – Included due to the submission format of “Manuscript Format”

- To establish available studies on the impact of COVID-19 conducted in South Africa.

Quantitative study

- To assess the level of concern about COVID-19 and general health among PLWH
- To determine strategies used to cope with challenges as a result of COVID-19 among HIV patients.
- To assess association between gender and the impact that COVID-19 (anxiety, irritability and depression) has on PLWH.

1.5.3 Hypotheses

- H_1 - Females will report more levels of anxiety, irritability and depression than males.

1.6 SIGNIFICANCE OF THE STUDY

The findings of the study are of utmost importance to PLWH as it granted an opportunity to amplify their voices on issues that directly affects them. The study serves as a greenlight for policy makers and the government of SA to make policies and implement COVID-19 interventions that are sensitive to the needs of PLWH, and to be responsive to the needs of PLWH in the implementation of COVID-19 strategies. The study address the literature gap because most studies in the existing literature have focused more on the impact of COVID-19 on the economy thus neglecting how PLWH have been affected in terms of the psychosocial well-being, yet according to WHO (2020), they are classified as one of the populations at risk due to COVID-19. This study may also sensitise academics, to carry out more studies based on emerging issues relating to HIV and COVID-19. To the discipline of Psychology, it might provide clinicians with knowledge that to enhance evidence based therapeutic interventions that address issues faced by PLWH during the COVID-19 lockdown.

1.7 DEFINITIONS OF TERMS

1.7.1 Antiretroviral therapy (ART) refers to any HIV treatment that uses a combination of multiple drugs that act on different viral targets, to decrease the patient's total burden of HIV, maintain function of the immune system and to prevent opportunistic infections that often lead to the demise of the patient (Grinsztejn, Hughes, Ritz, Salata, Mugenyi, Hogg & Cardoso 2019).

For this study ART refers to medication taken by PLWH to suppress and limit the progression of HIV.

1.7.2 COVID-19 (Coronavirus disease 2019) is defined as a disease caused by a novel virus coronavirus 2 (SARS-CoV-2; formerly called 2019-nCoV), which was first discovered among people during an outbreak of respiratory illness cases in Wuhan city, Hubei Province, China, (Cennimo, 2021). In this study COVID-19 refers to an on-going outbreak of a virus that is transmissible between humans and lacks targeted therapy, poses threat to global health, increases death toll in many countries and led to inevitable social distancing and lockdown in many parts of the world including SA.

1.7.3 Human Immunodeficiency Virus (HIV) is a blood-borne virus that weakens and attacks the immune system, which is mostly transmitted via sexual contact, needle sharing, transfusion of tainted blood products, and perinatal transmission such as through the birth canal, or breastfeeding; It affects persons of all ages, races socio-economic classes and sexual orientations (Singo, Lebeso, Nemathaga & Maluleke 2015). For purposes of this study HIV refers to the virus which infected adults who are on ART; that can be transmitted through contact with infected blood, semen or vaginal fluids; it may cause AIDS and related chronic diseases, requires medical diagnosis and ARV treatment which needs strict adherence to slow down disease's progress and to prevent infections and complications which may lead to death.

1.7.4 Acquired Immuno Deficiency Syndrome (AIDS) is a the late stage of HIV infection that occurs when the body's immune system is compromised by the virus, the number of CD4 cells fall below 200 cells/mm³ and when a person with HIV develops opportunistic infections regardless of their CD4 counts; and the life expectancy without treatment may fall to about one year (Xiao, Guo, & Chen 2019). For this study AIDS refers to the most advanced stage of infections caused by HIV, when the individual's immune system becomes weak and unable to fight certain types of infections and cancers; and experience involuntary weight loss, memory impairment and or Tuberculosis; and where a patient may require palliative care.

1.7.5 Impact implies positive or negative changes in people's lives; including changes in knowledge, skill, behaviour, health or living circumstances for children, adults, families or communities (United Nations, 2021). Impact in this study will refer to the end results, which could be challenges, benefits, gains, or coping mechanisms that the HIV positive people on ART may experience because of COVID-19.

1.8 RESEARCH METHODOLOGY

The methodological steps which were followed are explained. The following discussion focuses on outlining the study design, study setting, study population, sampling, data collection methods and instruments used, techniques used for analysing data, trustworthiness and ethical considerations.

1.8.1 Research design

A research approach is a plan and a series of steps which progress from general hypotheses to specific methods for gathering, analysing, and interpreting data (Creswell, 2016). This study employed the quantitative research

approach. According to Leavy (2022), quantitative research uses natural science methods to generate numerical data and hard truths. Using mathematical, computational, and statistical tools, it aimed to demonstrate a cause-and-effect link between variables (Creswell & Hirose, 2019). The information gathered by the researcher was categorised, ranked, or measured in terms of units. Using quantitative research, raw data graphs and tables were constructed, to make it easy for the researcher to analyse the findings (Ahmad, Wasim, Irfan, Gogoi, Srivastava, & Farheen, 2019). Quantitative research aims to generate knowledge and understanding of the social world (Apuke, 2017). The study design used in this research was descriptive designs that was cross-sectional in nature. The timepoint used was cross-sectional as a snapshot of what the researcher intended to investigate (Kesmodel, 2018). According to Kesmodel (2018), a cross-sectional study takes place at a single point in time, and it is efficient. This study was made even more ideal by the fact that its design allowed the researcher to collect a significant amount of data rapidly and effectively—all patients were given the same questionnaire. It was advantageous because it is simple to perform and finishes quickly. The investigation of the exposure and outcomes of COVID-19 from a substantial pool of PLWH subjects from selected health centres was done in a period of about a month; and allowed the researcher to study the association of different variables and compare differences (Zangirolami-Raimundo, Echeimberg, & Leone, 2018 ; Wang & Cheng, 2020), without altering the exposure status of the subjects.

1.8.2 Study setting

Vhembe District population is reported to be 1 402 779 with 416 728 residing at Makhado municipality, 51% of the population being between 18-64 years. This study was done in Makhado local municipality situated within the Vhembe district in the Limpopo Province of South Africa. It is one of the four municipalities in the district with a population of about 416 728 residents and is located approximately 100 km from the Zimbabwean border along the N1 Route. Makhado municipality is divided into four areas namely: Makhado, Vuwani, Dzanani and Waterval. The languages used in this municipality are largely Tshivenda and Xitsonga. This municipality had an unemployment rate of 37% in 2021; with 64% youth unemployment, 72% among women and 56% among men (Makhado Municipality, 2021). As such the communities in this municipality are on a poverty rank. Although the municipality experienced some degree of urbanization over the years, it still retained some rural character with a notable agricultural sector in the surrounding areas. The healthcare provider system that is utilized in this municipality is communal, and all patients meet at the same place to receive care or treatment. The study was carried out in two selected health centres within Makhado municipality namely, Makhado and Bungeni.

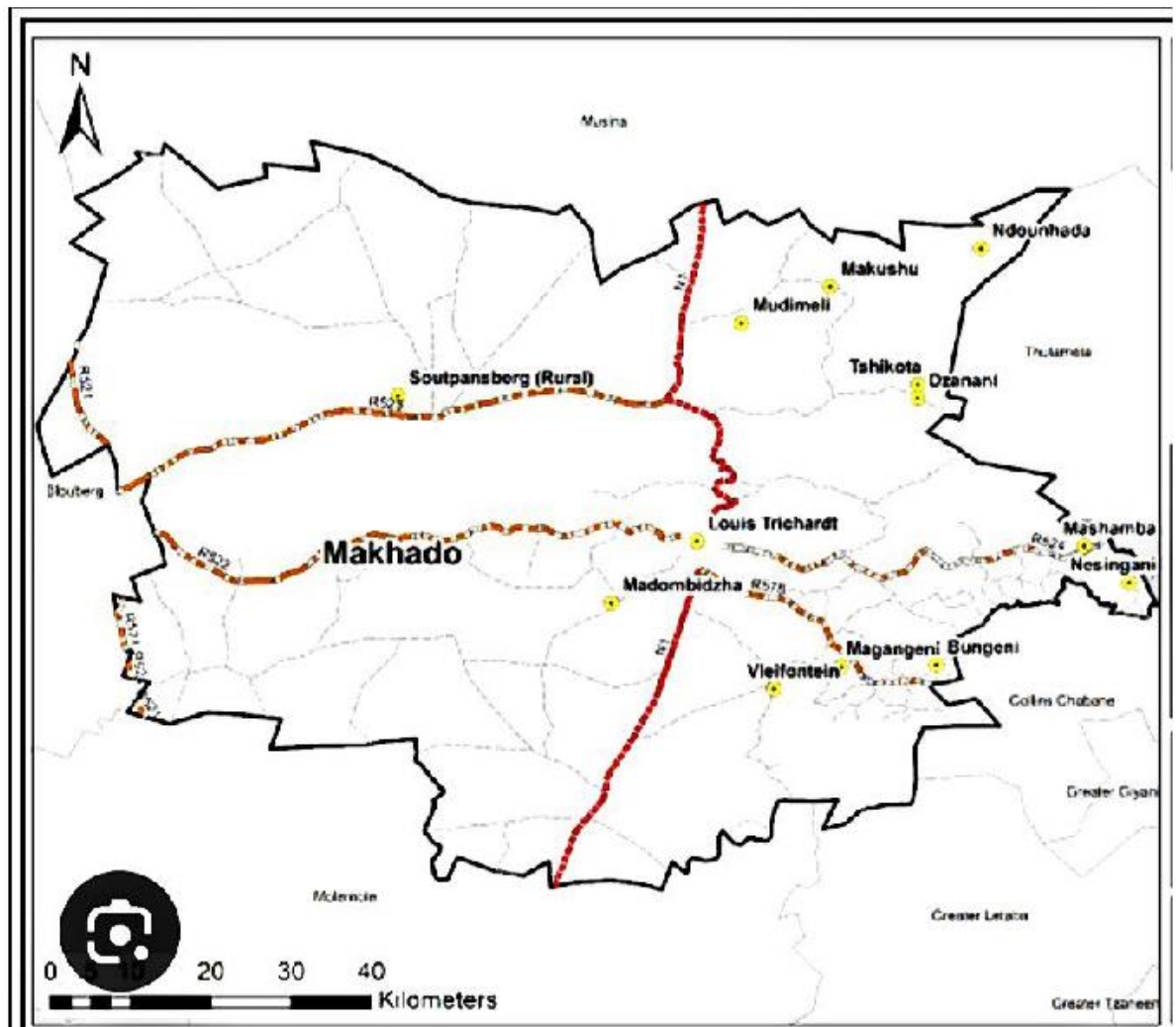


Figure 2.1 Map showing Makhado municipality in Vhembe District (Source: www.makhado.gov.za)

1.8.3 Study Population and sample

1.8.3.1 Target population

The target population are the people the study aimed to include for data collection (De Vos et al., 2011). Target population in this study were regular HIV positive adults, from the age of 18 and above, who received HIV testing services and were on ART during COVID-19 period and accessed their treatment at Makhado and Bungeni health centres; and are on the ART treatment register of the Department of health for Makhado municipality. The participants were both males or females who could speak or read Tshivenda and Xitsonga or English language. The researcher was interested in studying patients on ART because they were regarded as vulnerable, and that HIV is a chronic condition which needs continuous and uninterrupted treatment coupled with holistic support.

1.8.3.2 Sample and Sampling

A sample is a small part of the total set of objects, events, or persons upon which the researcher selects suitable representative items, humans or events (De Vos et al., 2011). Sampling is a technique of selecting a suitable sample that is representative of the desired population for determining parameters or characteristics of the whole population, (Aksakal, Bilecen & Schmidt, 2019). In this study, a sample was drawn from a portion of PLWH who are on ART. Adults, both females and males who are 18 years and above were sampled. Approximately 285 patients on ART took part in the study.

The researcher was permitted by the Limpopo department of health to have access HIV positive patients who are on ART, receiving ART treatment at selected health centres.

Simple random sampling was used in this study; it allowed each patient an equal chance to be (Etikan, Musa and Alkassim, 2016). The researcher was able to have access to ART patients through the register accessed with the help of Heal Care Workers in the centres. From the list, patients were selected randomly and located during their monthly vivists and those who were willing to participate were then recruited and enrolled. Makhado and Bungeni health centres are the largest and busiest HIV clinics which operate seven days a week to offer HIV and AIDS services including ART in Makhado municipality. Data was collected from recruited HIV positive patients who came for routine check-up and antiretroviral medication collection from Makhado and Bungeni health centres in Makhado municipality, Vhembe district, Limpopo. The nurses working in HIV clinic within the health centres assisted from their register to identify and recruit PLWH. The nurses would also assist to connect the researcher and the patients who agreed to participate in the study and engagements would take place in the researcher's room. The researcher used a private consulting room allocated for data collection to assure privacy. The interested and willing patients were provided with the information letter (Annexure A) to familiarize themselves with the study and how the data collection process would unfold. After that, they were provided with the consent form (Annexure B) to consent to take part in the study.

The data collection yielded 285 participants, 142 from Bungeni health centre and 143 from Makhado health centre.

To ensure representativeness of the population in the sample the Slovin's formula was used, to calculate the sample size. Slovin's formula is a sampling technique used statistically so that the selected samples are unbiased (Franklin & Isip, 2019). The formula is written as $n = N/(1+N/e^2)$ where N represents the total population from which the sample will be selected, and " e " represents the margin of error, and " n " is the sample size to be calculated. It is thus important that to effectively use the formula one should decide on the confidence level to use in the study, from which the margin of error will be deduced. In this study, the confidence level was 95 percent with margin of error of 0.05. From the calculation made a representative of 135 respondents will be recruited to form part of this study but data collected for the project was 285.

1.8.4 Inclusion and exclusion criteria

The research respondents included males and females who are HIV positive and were on ART in Vhembe district before the outbreak of COVID-19. Their age ranged from 18 years and above, and could speak Tshivenda, Xitsonga or English. Respondents have been domiciled in Makhado municipality for at least two previous years and those receiving ART at the selected health centres for the period stipulated prior COVID-19 breakout.

Respondents who were excluded from the study were those not willing to give informed consent and those who were terminally ill.

1.8.5 Data collection

This study was nested within a bigger project: The impact of COVID-19 Pandemic on People with HIV (FHS/21/PH/24/2411). Data collection was done after the ethical clearance certificate was granted by the University of Venda ethics' committee for the commencement of data collection; and the approval from the provincial Department of Health's research office. Survey data collection method was used. According to MacCombes (2021) survey study means collecting information about a group of people by asking them questions and analysing the results.

Data collection took place in a private room allocated, with the help of Nurses, respondents were identified from the register and those willing were then recruited. Data collection took 30-35 minutes for each respondent and a written consent was sought prior data collection. All ethics were ensured during data collection and respondents were informed that participating was voluntary which also meant that they could withdraw without fearing anything.

1.8.6 The instrument

The self-administered questionnaires from Study VIII: The impact of the COVID-19 pandemic on people with HIV were utilized to collect data for the study. The questionnaires were adapted for the project and permission for use was sought from authoring personnel or institutions of the instruments, and selected scales in the questionnaire aligned to the study objectives were used. The survey comprised of the following sections: Section A: Demographic information which included questions about age, gender, education, employment status and ethnicity. Section B comprised of the following scales: Concern about COVID-19; PROMIS 10 and COPE.

The concern about COVID-19 questionnaire comprised of 7 questions. The questions were asking about concern patients have about COVID-19 within the last 12 months and in the last 30 days. The PROMIS 10 measures perceptions of general health, quality of life, physical and mental health, social activities, and fatigue among respondents. PROMIS 10, the Patient-Reported Outcomes Measurement Information System (PROMIS) has been widely used (Cella, Riley, Stone, Rothrock, Reeve....Hays, 2010; Chan, Williams, Romano, Fehnel,

Slagle..Jerald, 2023). The internal consistency reliabilities of all composite scores were satisfactory with a Cronbach's alpha of 0.69-0.91. The Cronbach's alpha of PROMIS for the current study is satisfactory at 0.79.3.

COPE survey was used to assess the way the pandemic affected people's lives, particularly their mental health and coping strategies. The Cronbach's alpha of the previous study which used COVID-19 Participant Experience (COPE) survey was 0.86 after reverse scaling and it was satisfactory (Cook, Wood, Risner, Weng and Xin, 2023). The English version of the questionnaire was translated to Tshivenda and Xitsonga languages to cater for the language needs of the respondents and to ensure comprehension of the instruments and accurate responses. Language specialist translated the instrument and field experts reviewed for consistency and deliberated to accommodate the various dialect.

1.8.7 Validity and Reliability

1.8.7.1 Validity of the instrument

Validity refers to the extent to which an empirical measure adequately reflects the real meaning of the concept that is under consideration Mogorosi (2011). Validity of an instrument is a pivotal aspect of the development and assessment process of the instrument (Shafer & Zhang, 2012). The content and face validity of the study instrument was checked through asking research academic supervisor of this study to check if all aspects of the study are accurately measured by the instrument, to ensure that it covered the objectives of the research study and to ensure that the instrument tapped relevant responses from the respondents.

1.8.7.2 Reliability

Mogorosi (2011) defines reliability as the level of accuracy and precision of a measurement procedure. Reliability is done to ensure that the instrument that is used is able to obtain the same results each time it is used (Lane, 2013). For purposes of this research, the researcher used split half reliability during pre-testing where questions from the research questionnaire were split into two halves. They were administered to the respondents as two separate questionnaires. The correlation of the scores on the scale from the two halves were calculated after pretesting using Cronbach's Alpha (sometimes called Alpha coefficient). Finding found the Cronbach's alpha range between 0,79 – 0,91.

1.8.8 Pilot study

A pilot study was conducted with 25 small sample of respondents among HIV positive adults from Makhado health centre, using similar sampling method for the main study to reflect on the procedures of the main study; and to analyze the validity and the feasibility of the main study (Caspar, Peytchever & Cibelli, 2011). The inclusion and exclusion criteria of the participants was similar as well as the main study. Additionally, the suitability of the method for data collection was tested. The pilot study assisted in the planning and modification

of the main study. Instruments were piloted and adapted to accommodate different dialects within the Tshivenda language. The score was satisfactory to assure reliability and for validity the various experts assisted through multiple stages of reviews (Departmental, Faculty and University Higher Degree and Ethics).

1.8.9 Data management and analysis

The data from the questionnaires was coded into a Microsoft Excel spreadsheet before being uploaded to IBM SPSS software version 29.0 for analysis. Data was coded in SPSS, the Likert Scale was ranked from 1-5 and coded. Descriptive statistical was used to summarize the data and the results were presented in a frequencies, tables and percentages. Inferential statistics through cross tabulation were conducted to compare the two settings, all assumptions were observed in order to conduct the independent T-Test. The independent t-test was utilised to assess if gender has any significant association with depression, anxiety and irritability (the impact of COVID-19) on respondents. The researcher ensured the safekeeping of the data collected.

1.9 ETHICAL CONSIDERATIONS

The researcher made certain that ethical considerations were observed throughout the study to protect the researcher and the respondents from any harm and to ensure the rights of the respondents were honoured. Firstly, ethical clearance was sought from the ethics committee of University of Venda prior commencement of data collection. Secondly, the researcher was granted approval by the Limpopo Provincial Department of Health to conduct a study with patients in the health facilities.

During data collection assured confidentiality and privacy of respondents by using location that is nested within the same system in clinic's consulting rooms with same Health Care Professionals. The researcher ensured that each research respondent sign the consent form, and to be informed about the terms of taking part in the study prior questionnaire administration. The respondents completed the questionnaire on their own in the presence of the researcher for the researcher to give clarity whenever there was a need.

Respondents used about 30 minutes to complete the questionnaire. COVID-19 protocols were observed throughout the process of data collection. The researcher collected the completed questionnaires immediately for safe-keeping. The data collection process took place for approximately 30 days to allow all patients time to participate when they come for their monthly check-up and collection of medication.

The researcher further applied the following ethical considerations:

1.9.1 Confidentiality

To maintain confidentiality, the researcher made sure that information provided by the participants was kept

safe and private. This meant that no information was shared without the consent of the relevant participants. Even amongst the participants, there was no disclosure of another participant's responses. For all processes during data collection, no data was linked with identification information as such information was not provided or asked in the survey.

1.9.2 Right to anonymity

The researcher protected the identity of the participants by using the codes instead of their real names, there was no identification data that was collected in any response in the survey (Thackray 2018). Every participant remained anonymous and records were only handled by nurses and as part of regular routine.

1.9.3 Privacy

All the private information obtained from the respondents was kept safe. The researcher safeguarded the participants' privacy by collecting all questionnaires from the consulting rooms in the clinics where data collection was conducted and locked it up in the private cabinet in the University storage used by the supervisors for the project. This means that no person could access the information without seeking approval from the relevant personnel in the team.

1.9.4 Informed consent

The researcher ensured that respondents were aware of the study purpose through the provision of necessary information before the study commenced. This enabled the participants to understand the study purpose before giving consent to participate (Bryman 2017). The respondents were provided with an information sheet (see annexure A) which outlined the study purpose, and thereafter given the consent form to append signatures. The forms were translated to Tshivenda and Xitsonga languages to cater for participants who are not well conversant with English language. Every respondent provided consent verbally and written consent.

1.9.5 Voluntary participation

The researcher communicated the voluntary nature and the choice without feeling coerced and that the study was for academic purposes where participation was voluntary. The researcher further explained that no one is forced to participate, but they must do so willingly (Battacherjee (2012)). It was also explained that respondents may withdraw anytime during data collection without becoming afraid of any penalty.

1.9.6 Protection of respondents from any harm

The researcher verified that the questions and statements in the questionnaire used the language that is

ethnically, culturally, socially and politically sensitive (Grady 2019), to minimise any psychological or emotional harm that may occur to respondents during and after the course of the research. The researcher arranged with the department of health Psychology department for any referrals that might have arise as a results of participating in the study. However, no participant were referred in both health centres.

1.10 Delimitations

The research specifically focused on the impact of COVID-19 on HIV patients receiving ART, respondents were on ART treatment prior the outbreak of the COVID-19 pandemic. The study was restricted to HIV positive patients who are on ART, who resided at Makhado municipality for the previous two years, there were few respondents who were from other municipalities within the district and collected ART at Makhado and Bungeni for different personal reasons.

1.11 Plan for dissemination and implementation of results

All the data will be shared with the University of Venda and the health department. The potential dissemination partners in this study are policy mackers and ensuring feedback to the community especially participants through the Department of Health. In addition, to disseminate the research findings, the researcher prepared a scientific paper on the research findings and such will be shared in local, regional or international conferences and get published in peer rviewed journal of choice. The University has a copy of the study in the university library and on the university library data base.

1.12 REFERENCES

Abawi, K. (2013). *Data collection instruments (questionnaire & interview)*. Geneva: Geneva Foundation for Medical Education and Research.

Aksakal, M., Bilecen, B., & Schmidt, K. (2019). Qualitative sampling in research on international student mobility: insights from the field in Germany. *Globalisation, Societies and Education*, 17(5), 610-621.

Al Dhaheri, A. S., Bataineh, M. A. F., Mohamad, M. N., Ajab, A., Al Marzouqi, A., Jarrar, A. H., ... & Cheikh Ismail, L. (2021). Impact of COVID-19 on mental health and quality of life: Is there any effect? A cross-sectional study of the MENA region. *PloS one*, 16(3), e0249107.

Amuche, N. J., Emmanuel, E. I., & Innocent, N. E. (2017). *HIV/AIDS in sub-Saharan Africa: current status, challenges and prospects*. Available at : <https://www.ir.must.ac.ug>. Accessed on 25 September 2022).

Anne, A.V. (2021). *South Africans continued to receive ART during COVID-19 lockdown, but HIV testing and*

starting ART were impeded: Available at: <https://www.aidsmap>. (Accessed on 26 September 2021).

Arndt, C., Davies, R., Gabriel, S., Harris, L., Makrelov, K., Robinson, S., & Anderson, L. (2020). Covid-19 lockdowns, income distribution, and food security: An analysis for South Africa. *Global food security*, 26, 100410.

Bagula, A., Maluleke, H., Ajayi, O., Bagula, A., Bagula, N., & Bagula, M. (2020, July). Predictive models for mitigating covid-19 outbreak. In 2020 IEEE Symposium on Computers and Communications. *IEEE, SCC*, (pp. 1-7).

Banga, K., Keane, J., Mendez-Parra, M., Pettinotti, L., & Sommer, L. (2020). Africa trade and Covid-19: The supply chain dimension. *ODI Working Paper*, (586): 52.

Bhattacharjee, A. (2012). Social science research: Principles, methods, and practices. University of South Florida.

Bhavani, R. V., & Gopinath, R. (2020). The COVID19 pandemic crisis and the relevance of a farm-system-for-nutrition approach. *Food Security*, 12 (4), 881-884.

Binagwaho, A., & Mathewos, K. (2020). What explains Africa's successful response to the COVID-19 pandemic. *Medical News To*day*, 20 August 15

Bryman, A. (2017). Quantitative and qualitative research: further reflections on their integration. In *Mixing methods: Qualitative and quantitative research* (pp. 57-78). Routledge.

Caspar, R., & Peytcheva, E. (2011). *Cross-cultural survey guidelines. European Social Survey, Pretesting Revised*, 1-31.

Cennimo, D. J. (2021). *How did the coronavirus outbreak start?*. Retrieved on 22 February 2022

Chan, E. K., Williams, V., Romano, C., Fehnel, S., Slagle, A. F., Stoddard, J., ... & McQuarrie, K. (2023). Psychometric evaluation of the Symptoms of Infection with Coronavirus-19 (SIC): results from a cross-sectional study and a phase 3 clinical trial. *Journal of Patient-Reported Outcomes*, 7(1), 45.

Chenneville, T., Gabbidon, K., Hanson, P., & Holyfield, C. (2020). The impact of COVID-19 on HIV treatment and research: a call to action. *International journal of environmental research and public health*, 17(12), 4548.

Cook, S. H., Wood, E. P., Risner, E., Weng, C. A., & Xin, Y. (2023). A national examination of discrimination, resilience, and depressive symptoms during the COVID-19 pandemic: the All of Us Research Program. *Frontiers in Psychology*, 14, 1175452.

Cortez, P.A., Joseph. S.J., Das. N., Bhandari. S.S., & Shoib, S. (2020). Tools to measure the psychological impact of the COVID-19 pandemic: What do we have in the platter? *Asian Journal of Psychiatry*; 53, 102371. doi:10.1016/j.ajp.2020.1023718

Creswell, J. W. (2014). *A concise introduction to mixed methods research*. SAGE publications.

De Vos, A. S., Strydom, H. F., & Fouche, C. CB & Delpoit, CSL 2011. *Research at grass roots*.

Dorward, J., Khubone, T., Gate, K., Ngobese, H., Sookrajh, Y., Mkhize, S., ... & Garrett, N. (2021). The impact of the COVID-19 lockdown on HIV care in 65 South African primary care clinics: an interrupted time series analysis. *The Lancet HIV*, 8(3), e158-e165.

Escandón, K., Rasmussen, A. L., Bogoch, I. I., Murray, E. J., Escandón, K., Popescu, S. V., and Kindrachuk, J. (2021) COVID-19 false dichotomies and a comprehensive review of the evidence regarding public health, COVID-19 symptomatology, SARS-CoV-2 transmission, mask-wearing, and reinfection. *BMC infectious diseases*, 21, 1, 710,

Essien, E.J., Mgbere, Hm, Iloanusi, S & Abugosh, S.. (2021) COVID-19 infection among People with HIV/AIDS in Africa: Knowledge Gapa, Public Health Preparedness and Research Priorities. *International Journal of Maternal and Child Health and AIDS*, 10(1).

Esteves, C. S., Oliveira, C. R., De-Argimon, I.I .L. (2021). Social Distancing: Prevalence of Depressive, Anxiety, and Stress Symptoms among Brazilian Students during the COVID19 Pandemic. *Front Public Health*; 8:589966. doi:10.3389/fpubh.2020.589966

Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. *American journal of theoretical and applied statistics*, 5(1), 1-4.

Fardin, M. A. (2020). COVID-19 and anxiety: A review of psychological impacts of infectious disease outbreaks. *Archives of clinical infectious diseases*, 15, e102779.

Franklin, B. & Isip, T. (2019). *Posiion paper encouraging the use of slovin's formula in computing sample sizes*.

Academia.

Gehre, F., Lagu, H., Achol, E., Katende, M., May, J., & Affara, M. (2021). Commentary: mobile laboratories for SARS-CoV-2 diagnostics: what Europe could learn from the East African Community to assure trade in times of border closures. *Globalization and health*, 17(1), 1-5.

Glasow, P. A. (2005). Fundamentals of survey research methodology. Retrieved January, 18, 2013.

Grinsztejn, B., Hughes, M. D., Ritz, J., Salata, R., Mugenyi, P., Hogg, E., ... & Shahkolahi, A. (2019). Third-line antiretroviral therapy in low-income and middle-income countries (ACTG A5288): a prospective strategy study. *The Lancet HIV*, 6(9), e588-e600.

Grady, C. (2019). The continued complexities of paying research participants. *The American Journal of Bioethics*, 19(9), 5-7.

Grinsztejn, B., Hughes, M. D., Ritz, J., Salata, R., Mugenyi, P., Hogg, E., ... & Shahkolahi, A. (2019). Third-line antiretroviral therapy in low-income and middle-income countries (ACTG A5288): a prospective strategy study. *The lancet HIV*, 6(9), e588-e600.

Hatala, A. R. (2012). *The status of the “biopsychosocial” model in health psychology: Towards an integrated approach and a critique of cultural conceptions*. <https://www.bing.com>. (Accessed 25 April 2022).

Hogan, A. B., Jewell, B. L., Sherrard-Smith, E., Vesga, J. F., Watson, O. J., Whittaker, C., ... & Hallett, T. B. (2020). Potential impact of the COVID-19 pandemic on HIV, tuberculosis, and malaria in low-income and middle-income countries: a modelling study. *The Lancet global health*, 8(9), e1132-e1141.

International AIDS Society. COVID-19 and HIV. Atale of two pandemics. COVID-19 and HIV. (iasociety.org). Accessed on 26 September 2021. Jackson, J. K. (2021). *Global economic effects of COVID-19*. Congressional Research Service.

Jiang, H., Zhou, Y., & Tang, W. (2020). Maintaining HIV care during the COVID-19 pandemic. *Lancet HIV*; 7(5):e308-e309. Doi: 10.1016/S2352-3018(20)30105-3

Joska, J. A., Andersen, L., Rabie, S., Marais, A., Ndwandwa, E. S., Wilson, P., & Sikkema, K. J. (2020). COVID-19: increased risk to the mental health and safety of women living with HIV in South Africa. *AIDS and Behavior*, 24(10); 2751-2753.

Lane, D. M., Scott, D., Hebl, M., Guerra, R., Os Lane, D. M., Scott, D., Hebl, M., Guerra, R., Osherson, D., &

- Zimmer, H. (2013). *Introduction to statistics: An interactive e-book*. University of Houston.
- Herson, D., & Zimmer, H. (2013). *Introduction to statistics: An interactive e-book*. University of Houston.
- Lu, J. (2020). *How Different Countries Have Handled COVID-19, Ranked*. UN Dispatch.
- Makhado municipality. (2021). *IDP plan*. Available at: <http://www.makhado.gov.za>. Accessed 07 February 2024).
- McCombes, S. (2021). *How to do survey research. Doing Survey Research: A Step-by-Step Guide* (scribb.com)
- Mogorosi, L.D. (2011). *Steps in research and thesis writing process. Choice and management project*: University of Venda.
- Mothi N, Lala and Tappuni. (2016) HIV/AIDS in women and children in India. *Oral Diseases*, 2, 1, 19–24.
- Msomi, N. (2020). Covid-19 hinders South Africa's HIV, TB targets, but offers chance to innovate. *Health E News*, 5 August.
- Musetha, M. (2016). Vhembe does well in fighting HIV/AIDS. *Limpopo Mirror*, 10 December
- Muzyamba, C., Makova, O. M., & Mushibi, G. (2021). Views and experiences on lockdown as a response to the prevention and control of COVID-19 crisis among residents of Uganda. *Europe PMC*. <https://doi.org/10.21203/rs.3.rs-432060/v1> PPR: PPR317959J
- Okonji, E. F., Okonji, O. C., Mukumbang, F. C., & Van Wyk, B. (2021). Understanding varying COVID-19 mortality rates reported in Africa compared to Europe, Americas and Asia. *Tropical Medicine and International Health*, 26(7), 716-719.
- Olufadewa, I., Oduguwa, I., Adesina, M., Ibiang, K., Eke, N., Adewumi, B., ... & Adeyelu, N. (2021). COVID-19: Learning from the HIV/AIDS pandemic response in Africa. *The International Journal of Health Planning and Management*, 36(3), 610-617.
- Pillay-van Wyk, V., Msemburi, W., Dorrington, R. E., Laubscher, R., Groenewald, P., & Bradshaw, D. (2019). HIV/AIDS mortality trends pre and post ART for 1997-2012 in South Africa—have we turned the tide?. *South*

African Medical Journal, 109 (11b), 41-44.

Posel, D., Oyenubi, A., & Kollamparambil, U. (2021). Job loss and mental health during the COVID-19 lockdown: Evidence from South Africa. *PloS one*, 16(3), e0249352.

Poudel, P. B., Poudel, M. R., Gautam, A., Phuyal, S., Tiwari, C. K., Bashyal, N., & Bashyal, S. (2020). COVID-19 and its global impact on food and agriculture. *Journal of Biology and Today's World*, 9(5), 221-225.

Prabhu, S., Poongulali, S., & Kumarasamy, N. (2020). Impact of COVID-19 on people living with HIV: a review. *Journal of virus eradication*, 6(4), 100019.

Roy, S. (2020). Economic impact of COVID-19 pandemic. A preprint. *researchgate. net*, (1)29.

Schleicher, A. (2020). *The impact of COVID-19 on education: Insights from education at a glance 2020*. Available at: <https://www.oecd.org/education/the-impact-of-covid-19-on-education-insights-education-at-a-glance-2020>. (Accessed 4 May 2022).

Shafer, D. S., & Zhang, Z. (2012). *Introductory statistics*. Washington, DC: Saylor Foundation.

Shi, L., Tang, W., Hu, H., Qiu, T., Marley, G., Liu, X., ... & Fu, G. (2021). The impact of COVID-19 pandemic on HIV care continuum in Jiangsu, China. *BMC infectious diseases*, 21(1), 1-9.

Slaughter, F. A. (2021). *The Impact of COVID-19 Stress on ART Adherence and Unsuppressed Viral Loads in People Living with HIV in Western Washington*. Published Thesis. University of Washington, Public health.

Smith, S. (2021). *Impact of the COVID-19 Pandemic on Persons Living with HIV in Western Washington: Examining Lived Experiences of Social Distancing Stress, Personal Buffers, and Mental Health*. Published Thesis. University of Washington, Public, health.

Singo, V. J., Lebesse, R. T., Nemathaga, L. H., & Maluleke, T. X. (2015). The views of the elderly on the impact that HIV and AIDS has on their lives in the Thulamela Municipality, Vhembe District, Limpopo province. *Curationis*, 38(1), 1-8.

Statistics South Africa (Stats SA). (2018). *Mid-Year Population Estimates*. Pretoria, South Africa, Stats SA. Available at: <http://www.stassa.gov.za>: (Accessed 25 September 2021)

Statistics South Africa (Stats SA). (2021). *Mid-Year Population Estimates*. Pretoria, South Africa, Stats SA.

Available at: <http://www.stassa.gov.za>: (Accessed 25 September 2021)

Statistics South Africa (Stats SA). (2020). *Social impact of COVID-19 (Wave 3): mobility, Migration, and Education in South Africa*. Pretoria, South Africa, Stats SA. Available at: <http://www.statssa.gov.za>: (Accessed 25 September 2021)

Stoll, C., & Mehling, M. A. (2020). COVID-19: clinching the climate opportunity. *One Earth*, 3(4), 400-404.

Suls, J. M., Luger, T., & Martin, R. (2010). *The biopsychosocial model and the use of theory in health psychology*. Handbook of health psychology and behavioral medicine, 15-27.

Sun, S., Hou, J., Chen, Y., Lu, Y., Brown, L., & Operario, D. (2020). Challenges to HIV care and psychological health during the COVID-19 pandemic among people living with HIV in China. *Journal of AIDS and Behavior*, 24(10), 2764-2765.

Thackray, L. (2018). The Palgrave handbook of disabled children's childhood studies. *Springer*, 10 (1-137.

Tikkanen, R. A. G. N. W., & Reginald, D. (2020). *How the US Compares to Other Countries in Responding to COVID-19: Populations at Risk, Health System Capacity, and Affordability of Care*. Available at: <http://www.pesquisa.bvsalud.org>. (Accessed 25 September 2021)

United Nations Department of Economic. (2021). World social report 2021: reconsidering rural development. United Nations.

Vhembe District Municipality. (2020). *Draft Annual Report 2019/2020. Vhembe District*: Available at: <http://www.vhembe.gov.za>. (Accessed 25 September 2021)

Wang, X., & Cheng, Z. (2020). Cross-sectional studies: strengths, weaknesses, and recommendations. *Chest*, 158(1), S65-S71.

Waterfield, K.C., Shah, H.G., Etheredge3, G.D., & Ikhile, O. (2021). Consequences of COVID-19 crisis for persons with HIV: the impact of social determinants of health: Commentary; *BMC Public Health*, (21) 229, 2-7

Weiss, P., & Murdoch, D. R. (2020). Clinical course and mortality risk of severe COVID-19. *The lancet*, 395(10229), 1014-1015.

Weissman, D., Alameh, M. G., de Silva, T., Collini, P., Hornsby, H., Brown, R., ... & Montefiori, D. C. (2021). D614G spike mutation increases SARS CoV-2 susceptibility to neutralization. *Cell host and microbe*, 29(1), 23-31.

World Health Organization. (2020). *COVID-19 Global risk Communication and Community Engagement Strategy*. Available at: <http://www.apps.who.int>. Accessed 25 September 2021).

Xiao, Q., Guo, D., & Chen, S. (2019). Application of CRISPR/Cas9-based gene editing in HIV-1/AIDS therapy. *Frontiers in cellular and infection microbiology*, 9(69).

Zangirolami-Raimundo, J., de Oliveira Echeimberg, J., & Leone, C. (2018). Research methodology topics: Cross-sectional studies. *Journal of Human Growth and Development*, 28(3), 356-360.

SECTION 2

MANUSCRIPTS

2.1 Author Guidelines for African Journal of AIDS Research

Submission instructions for authors: African Journal of AIDS Research

African Journal of AIDS Research (AJAR) publishes papers that make an original contribution to the understanding of the social dimensions of HIV and AIDS in the African contexts. AJAR will publish research articles of 5000-7500 words and short communications of 2000 words. Review papers will be considered only if they make an original conceptual and theoretical contribution to the field. Invited book reviews are also published.

Editorial policy: Submission of a manuscript implies that the material has not previously published, nor is it submitted elsewhere for publication. Contributions are accepted with the understanding that the authors have the authority for publication. Submission will be taken to imply transfer of copyright of the material to the publishers. NISC (Pty) Ltd. Contributions must conform to the principles outlined in **Ethical Considerations in Research Publication** available on the AJAR website download.

Papers submitted to AJAR will be reviewed by two appropriately qualified and experienced referees to ensure that all articles accepted for publication are methodologically and conceptually sound and make an original contribution to the field. The journal adheres strictly to a double anonymized review process. The final decision to accept a manuscript rests with the Editor-in-Chief. Queries regarding manuscripts can be addressed to the editorial office at ajar.editor@nisc.co.za.

Submissions: Manuscript submissions should be made online at the African Journal of AIDS Research ScholarOne manuscripts site. New users should first create an account. Once a user is logged onto the site, submissions should be made via the Author Centre. Manuscripts should adhere to the format criteria described below, and papers failing to do so will be returned to authors to be corrected before being reviewed. Authors can make use of language editing service to ensure that the presentation of their work is of an appropriate standard for submission.

Manuscript presentation: Submitted manuscripts should contain the following sections, each in separate files: Title page: The title (max. 20 words) should be a concise description of the article content. Author names must appear only on the title page. This page should also include each author's names (full first name and surname), each author's full institutional affiliation, the e-mail address of the designated corresponding author. Recommended, but not

required, are short biographical notes for the authors (highest academic degree, work experience, research interests) and/or any acknowledgements.

Abstract: This should include the title of the paper and an abstract. The abstract is a concise statement of the scope of the work, the principal findings and the conclusions and should not exceed 250 words. It should not contain references. Below the abstract, up to eight additional keywords or phrases (which are not already given in the title) should be listed in alphabetical order. Short communications also require brief abstracts (max. 150 words).

Main text: All papers should include Introduction and Conclusions sections, but given the diverse range of papers that might be published in AJAR, we do not prescribe a standard format for the middle section. Format – Manuscripts should be prepared in MSWord. The headings and text should be presented in 12-point Arial or Calibri font. The text should use 1.5-line spacing, with no extra line spacing, and should not include text columns, creative formatting or additional fonts. Headings should be sentence case and never numbered. There should be no more than three heading levels: (1) bold, (2) bold italics, (3) italics. Endnotes, not footnotes, may be used sparingly. Tables and figures (graphs, photographs or scanned images) should not be part of the text but prepared as separate files.

Editorial style – Manuscripts should be written in clear English (UK spelling). Consult the Oxford English Dictionary for spelling, capitalisation, hyphenation and abbreviation conventions. Consult a copy of the journal for general style conventions. Double quotation marks and regular font should be used to designate material quoted directly from other texts. Direct speech should be italicised. Use single quotation marks to signify a quote embedded within another quotation. Double quote marks and italic font should be used to denote informants' quotes. The period (.) must be used as the decimal indicator, and 'thousands' should be designated by a space rather than a comma (Example: 1 500 000). Conventions on presenting mathematical and statistical data are outlined in Guidelines for the presentation of mathematical and statistical data available for download below.

Referencing: Use APA 6 author–date style. Multiple citations in the text must be separated by semicolons and cited chronologically in the form (Habib, 1998, 2005; Bwanika & Davis, 2000; Ministry of Health, 2011). If there is more than one citation with the same publication year, these should be listed alphabetically. If previously published work is quoted directly, the citation must include the author, year of publication, and page number as in (Ajulu, 1999, p. 63). If more than five authors are cited in a reference, use only the name of the first author followed by 'et al'. The reference list should be in alphabetical order by first author, and include all the authors of a given reference (do not use "et al." in the list); likewise, use full journal

titles. URLs may be cited only for references that are not available in print (such as a webpage) or ones that link to hard-to-find sources (e.g. municipal document), and these URLs must be up-to-date at the time of submission. Include DOIs for articles where possible.

Example reference list:

Creswell, J. W. (2007). *Qualitative inquiry and research design: Choosing among five approaches* (2nd ed.). Thousand Oaks, CA: Sage.

Cockerham, W. C. (2000). The sociology of health behaviour and health lifestyles. In Bird C, Conrad P, & Fremont A. (Eds.), *Handbook of Medical Sociology*. (pp. 159–172). Upper Saddle River, NJ: Prentice-Hall.

Klopper, C., Stellenberg, E., & van der Merwe, A. (2014). Stigma and HIV disclosure in the Cape Metropolitan area, South Africa. *African Journal of AIDS Research*, 13(1), 37–43. <http://dx.doi.org/10.2989/16085906.2014.886606>

Bicego, G., Nkambule, R., Peterson, I., Reed, J., Donnell, D., Ginindza, H., ... Justman, J. (2013). Recent patterns in populationbased HIV prevalence in Swaziland. *PLoS One*, 8(10), e77101. <http://dx.doi.org/10.1371/journal.pone.0077101>

World Health Organization. (2014, May). Swaziland: health profile. <http://www.who.int/gho/countries/swz.pdf?ua=1> (accessed Jan 17, 2014).

Tables and Figures – Tables and figures should contain only information directly relevant to the content of the paper. Each table and figure must include a full, stand-alone caption, and each must be sequentially mentioned in the text. Highly stylised formatting should be avoided. Tables may use thin, horizontal lines but should not include cells with shading. Authors must ensure that their figures conform to the style of the journal. Pay particular attention to line thickness, font and figure proportions, taking into account the Journal's printed page size. Costs of redrawing figures may be charged. Please refer to Figure Guidelines for Authors: format, style and technical considerations available for download below. For digital photographs or scanned images the resolution should be at least 300 dpi for colour or greyscale artwork and a minimum of 600 dpi for black line drawings. These can be saved (in order of preference) in PSD, JPEG, PDF or EPS format. Graphs, charts or maps can be saved in AI, PDF or EPS format. MS Office files (Word, Powerpoint, Excel) are also acceptable but DO NOT EMBED Excel graphs or Powerpoint slides in a MS Word document, rather send the original Excel or Powerpoint files. More detailed technical information is given in Figure Guidelines for Authors.

Confirmation of Manuscript Submission

2.2 Manuscript 1

Title of the manuscript: The impact of COVID-19 on ART adherence in HIV positive adults in South Africa: A systematic review

Moyo Ramasela, Maphula Angelina and Makhado Lufuno

Department of Psychology, Faculty of Health Sciences, University of Venda, Thohoyandou, South Africa.

Department of Public Health, Faculty of Health Sciences, University of Venda, Thohoyandou, South Africa.

Corresponding Author

Department of Psychology, Faculty of Health Sciences, University of Venda, Thohoyandou, South Africa.

E-mail: ramaselamoyo@gmail.com

Tel: 0764209330

The impact of COVID-19 on ART adherence in HIV positive adults in South Africa: A systematic review

Abstract

Several areas in the health care system were impacted by the COVID-19 in South Africa. Various control and mitigation measures were taken to stop the virus' extensive breakout. It was feared that COVID-19 might disrupt availability of HIV services at various levels. The objective of this review is to systematically assess the impact of COVID-19 on ART adherence of South African adults who are HIV positive and are on ART treatment. Despite more people having access to ART and potential decreases in stigma, the prevalence of mental illness among people living with HIV (PLWH) has remained high. COVID-19 negatively impacted PLWH by increasing the mental health burden. According to research, mental illness can negatively impact adherence to therapy. In this study, a systematic database search was conducted which included EBSCOhost, Scopus, Science Direct, PubMed and Google Scholar. The retrieved sources went through a two step process of title abstract and full text review. 13 selected studies which met the study requirements were included in this review. Overall, a reduction in HIV testing, positive tests and ART initiation were reported. The findings revealed two main themes, namely: impact of COVID-19 on ART adherence and experiences of patients during COVID-19. Findings showed that although there was a resilience of ART provision in South Africa to ensure adherence to treatment, the COVID-19 posed a number of challenges including psychological disorders; such as anxiety and depression, an increase in the abuse of substances, poverty, lack of treatment support groups; stigma and discrimination which play a pivotal role in ART adherence. The government designation of resources for comprehensive HIV/AIDS care for anticipated pandemics and prioritization of psychological treatment are essential to foster ART adherence in the future and mitigate mortality rate of PLWH.

Key words: Adherence, ART, Mental health, Pandemic, PLWH, Resilience, South Africa,

Introduction

The governments and health agencies throughout the world began to prepare for the mitigation of the novel coronavirus SARS-CoV-2 in December 2019 in Wuhan, China, following its unexpected emergence, (Campbell, 2020; Joska et al, 2020 & Mendelsohn & Ritchwood, 2020). The impact of the pandemic was anticipated to fall most heavily on disadvantaged groups in under-resourced countries characterised by poor health systems, populations living under the poverty line in populated areas characterised by lack of essential infrastructure such as water and sanitation, which created unique difficulties for the implementation of physical distancing regulations (Campbell, 2020 & Jardim, Zamani, & Akrami, 2022). Governments were faced with the dilemma of protecting their populations from COVID-19, whilst recognizing that lockdown measures may exacerbate health inequalities and negatively impact health and wellbeing of people in poor settings.

The first case of COVID-19 in South Africa (SA) was registered in March 2020, then President of the Republic of SA, Mr Cyril Ramaphosa declared a national state of emergency on 15th of the same month, then later a national lockdown on March the 27th. SA was one of the countries of the world to take a lead in implementing strictest lockdown. A lockdown implemented by the SA government at the beginning phases of the COVID-19 outbreak stemmed the spread of infection, and led to the healthcare system to be overwhelmed with cases. While the effect of the lockdown and social distancing on “flattening the curve” remained to be seen, the mental health and wellbeing of the people of South Africa was at increased risk (Joska, 2020; Mcinziba et al & SeyedAlinagh et al, 2023).

It was estimated that by the year 2020 37.6 million worldwide people were living with HIV, of which 1.3 million adults, about 16% of PLWH did not know their HIV status; 27% were unable to access ART, and 34% of those who received ART did not have viral suppression; and it is further estimated that about 19% of HIV-infected patients were unable to receive a refill for antiretroviral drugs during the pandemic (SeyedAlinagh et al, 2023). COVID-19 pandemic has spurred panic in SA, as it is a country reported to have the highest rate of HIV with an estimated 8.2 million PLWH; and by 2021, only 68% (5.5 million) of PLWH received ART in SA (Lambarey, 2020; Mendelsohn & Ritchwood, 2020 & Mcinziba, 2023). This high rate of HIV infections has been a long term concern and the situation was exacerbated by COVID-19 as

there was conflicting data as to whether there was an interplay between the COVID-19 and HIV/AIDS pandemics (Lambarey, 2020); and while it is believed that ART seems to confer some protection against severe COVID-19, the sound relationship of ART with COVID-19 outcomes is in need of further research.

Be that as it may, the department of health in South Africa adopted World Health Organisation (WHO) guidelines in 2016, which recommended that antiretroviral therapy (ART) be made available to all PLWH for life, based on the research findings that initiating ART early after a positive HIV test was beneficial to the individual person (Mendelsohn & Ritchwood 2020; Mcinziba, 2023 & Orr, Hajiyanis, & Motuba, 2023). Since then, HIV programmes in SA have continued to expand their services to facilitate ART adherence for PLWH (Roy et al 2022).

However, achieving optimal ART adherence during COVID-19 period was a challenge as it involved the patients' extensive engagement with health care providers, pharmacy pill refills, taking medication daily at prescribed times and following dietary instructions for positive output.

The COVID-19 impact on HIV services in SA was of particular concern; despite promising milestones in HIV prevention. A study predicting the potential impact of the pandemic on HIV services, suggested that temporary interruptions and the difficulty to follow up on ART adherence were likely to affect all aspects of the HIV care cascade, and that may result in long-term rises in HIV death rate (Dorward et al, 2021; Jardim, 2022; Mcinziba 2023 & SeyedAlinaghi, 2023).

Successful ART adherence support needs an understanding of the multi-level factors affecting overall adherence; which include socio-demographic, socioeconomic, psycho-social and environmental conditions. Knowledge of these factors may be employed to identify people at risk of non-adherence and to identify factors that can promote ART adherence and improve patient care and programmatic outcomes (Gumede, 2021).

Therefore, this study aims to describe the impact of COVID-19 on ART adherence in HIV positive adults in SA. There is uncertainty and lack of clarity on COVID-19 effects, which posed challenges such as psychological disorders like depression and anxiety; and socio-economic

problems consequently impacting on ART adherence of PLWH as these factors play an important role in ART adherence.

Methods

Search Strategy

The systematic review followed the step by step guidelines outlined in Tawfik et al. (2019). The steps were modified and adjusted to correspond with the nature and objectives of the study. The search for information sources was carried through on several dates commencing from February 2023 until the final search on the 20 September 2023 from electronic databases which included EBSCOhost, Scopus, Science Direct, PubMed and Google Scholar. The researcher employed multiple combinations of keywords to identify the relevant sources for the review such as: "The impact of COVID-19, ART, adherence, HIV, adults and South Africa". Relevant searches were downloaded from the databases to the EndNote21 where duplicates were excluded.

Inclusion and Exclusion criteria

The review included studies written in English language, which were conducted in South Africa and published between 2020 and 2023. The inclusion of sources was limited to the most recent information of data during COVID-19 pandemic in SA; which included the period of lockdown implementation at various phases in March 2020 to the present day. All study methodologies were included. The studies which examined, explored and assessed the relationship between COVID-19 and access to and disruptions of HIV and TB services as well as those which outlined psychological, social and behavioural implications were considered due to interrelationship in terms of COVID-19 pandemic effects. The review excluded data focusing on children and adolescents, papers with unavailable full text and those which lacked specificity in South African impact in terms of COVID-19.

Study selection

The study selection for this review followed a Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow chart in Figure 1 to summarize the review's sampling process. PRISMA is an evidence-based minimum set of items designed to enhance

and improve the reporting in systematic reviews and meta-analyses. The overall search for all databases yielded 17400 sources, and 15300 which were duplicates and irrelevant were removed. After title and abstract review, 2077 studies were excluded from full text screening. The study articles removed were those which did not align with the aim of the study or failed to specifically address South Africa in terms of COVID-19 impact. The remaining full text studies to be read were 23. The process finalised with a total of 13 articles which were evaluated and included for the analysis of the review.

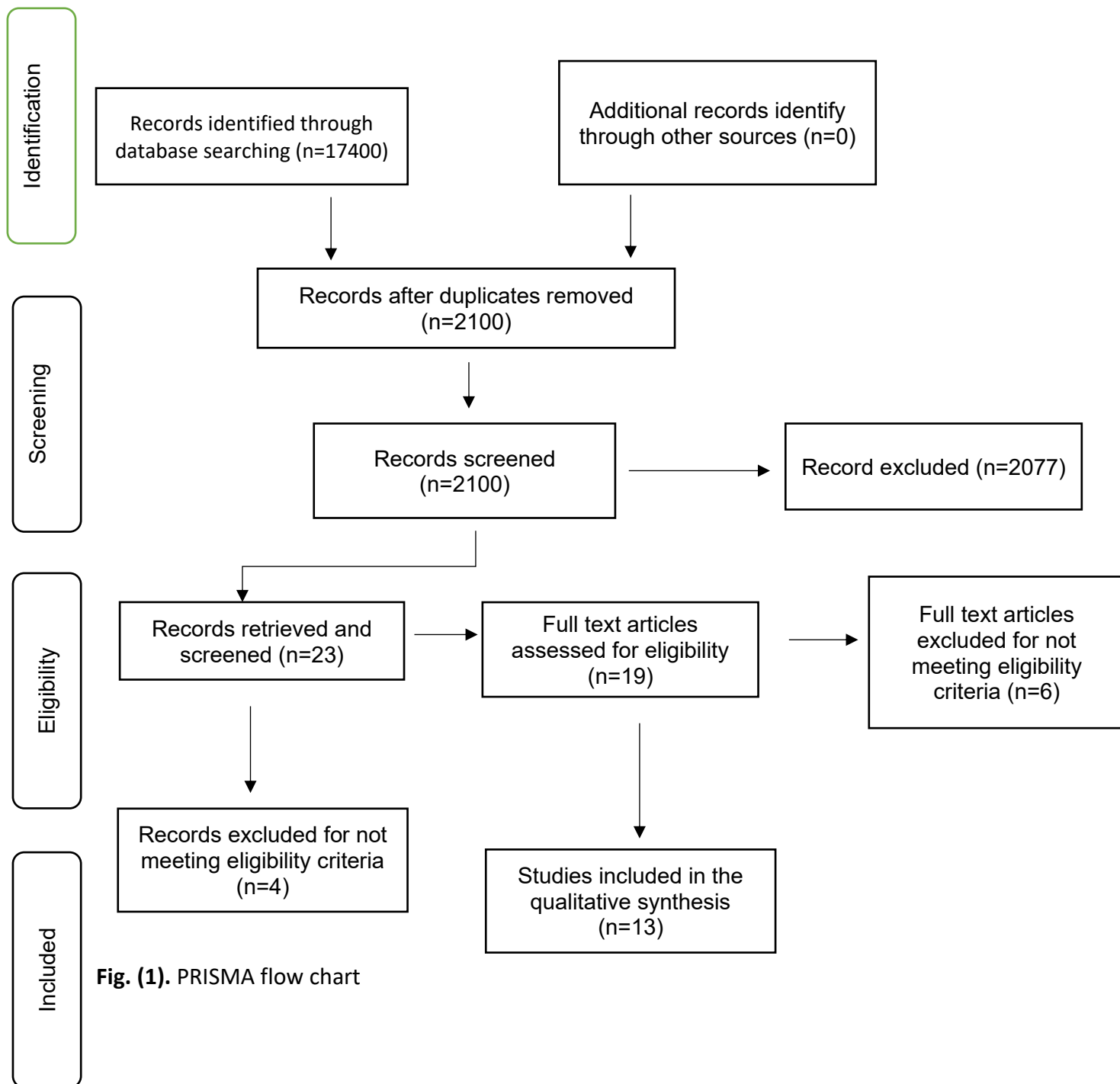


Fig. (1). PRISMA flow chart

Appraisal of included studies using CASP

The quality of the study was assessed using the Critical Appraisal Skills Programme (CASP). CASP is a designed tool in a form of standardised list, for appraising the strengths and limitations of a study.

Table 1. Selected studies appraisal using CASP.

Study author(s)	Title	Design	%
Campbell et al (2022)	Stay-at-home: the impact of the COVID-19 lockdown on household functioning and ART adherence for people living with HIV in three sub-districts of Cape Town, South Africa.	Cluster –randomised controlled trial	80%
Dorward et al (2021).	The impact of the COVID-19 lockdown on HIV care in 65 South African primary care clinics: an interrupted time series analysis.	Interrupted time series	90%
Gumede et al (2021)	Study protocol: Strengthening understanding of effective adherence strategies for first-line and second-line antiretroviral therapy (ART) in selected rural and urban communities in South Africa.	Mixed method: Parallel Convergent approach	90%
Gumede et al (2023)	Predictors of Treatment Adherence and Virological Failure Among People Living with HIV Receiving Antiretroviral Therapy in a South African Rural Community: A Sub-study of the ITREMA Randomised Clinical Trial.	Randomised Clinical Trial	90%
Jardim et al (2022)	Evaluating the impact of the COVID-19 pandemic on accessing HIV services in South Africa.	Systematic Review	90%
Joska et al (2020)	COVID-19: increased risk to the mental health and safety of women living with HIV in South Africa.	Commentary	70%
Lambarey et al (2022)	SARS-CoV-2 Infection Is Associated with Uncontrolled HIV Viral Load in Non-Hospitalized HIV-Infected Patients from Gugulethu, South Africa.	Cohort	90%

Mcinziba et al (2023)	Managing household income and antiretroviral therapy adherence among people living with HIV in a low-income setting: a qualitative data from the HPTN 071 (PopART) trial in South Africa.	Cort (Trial)	80%
Mendelsohn & Ritchwood (2020)	COVID-19 and antiretroviral therapies: South Africa's charge towards 90–90–90 in the midst of a second pandemic.	Commentary	60%
Orr et al (2023)	COVID-19 impact on newly initiated and restarted ART patients in Eastern Cape:SA	Mixed method	80%
Roy et al (2022)	The Social, Behavioral, and Ethical Modalities of COVID-19 on HIV Care in South Africa: A Systematic Review.	Systematic Review	80%
SeyedAlinagh et al (2023)	The impacts of COVID-19 pandemic on service delivery and treatment outcomes in people living with HIV: a systematic review.	Systematic Review	90%
Siedner et al (2020)	Access to primary health care during lock down measures for COVID-19 in rural South Africa	Observational Cohort	70%

Characteristics of included studies

The characteristics and conclusions were found to further justify the 13 studies included. The sources of collected data, analysis and features that appear to be common in the articles were considered. All the included studies were published within the past 5 years which indicated that the area of interest is less researched.

Table 2: Characteristics of the selected studies

Author/s & Date	Objectives	Setting	Design	Population & sample	Findings	Limitations
Campbell et al (2022)	a)To investigate changes in the individual, social and structural factors affecting ART adherence between the pre- and post-level five lockdown. b)To investigate the correlates of ART	Cape Town Metro areas in South Africa	Quantitative cluster randomised trial study	152 adult PLWH enrolled for Sinako ART adherence trial study	a)Lockdown impact is unequal, dependent on a complex web of individual, social and structural factors a1) Lockdown impacted ART adherence through multiple interconnected ways a2) Importance of	a) Limited number of clusters (ART clinics) compared to recommendations in the literature b) Selection bias: of 152 baseline research participants, only 83 participated in the follow-up c)Self-reported

	adherence during the level five (strictest) lockdown, in order to ascertain whether ART could be impacted by any changes in these factors during lockdown				household level factors in ART adherence b) Reported IPV during lockdown was correlated with worse adherence to ART and the odds of reporting IPV were low 'probably due to alcohol ban and under-reporting if the perpetrator is living in the same household c) No relationship between income and ART adherence and education level of respondent and ART adherence	adherence scores
Dorward et al (2021).	a) To measure the impact of the 2020	Kwa-Zulu Natal	Quasi-experime	HIV patients' data from 65	a) ART provision was mostly maintained	-Information on detailed HIV testing short term

	national COVID-19 lockdown on HIV testing and treatment in KwaZulu-Natal, South Africa		ntal- Interrupted time series	clinics	during the 2020 COVID-19 lockdown b)HIV testing and ART initiations were largely impacted. c)Implementation of ways to increase testing and treatment initiation.	trends was not available due to the template used for HIV testing data -HIV viral load outcomes were not assessed due to time taken to capture the records
Gumede et al (2021)	To describe the barriers and facilitators to adherence for patients receiving first line and second line ART , identify different adherence strategies utilized and make recommendations for	Gauteng and Limpopo provinces	Randomized control trial and systematic review	7 high volume health facilities in Gauteng and 1 in Limpopo	a) Intra and interpersonal level factors and comorbidities influence ART adherence b)Community level factors affect ART adherence	-Data inconsistencies and missing data -Memory and social desirability biases

	an improved adherence strategy					
Gumede et al (2023)	To assess risk factors for adverse outcomes of ART namely non-adherence and virological failure in rural South African PLHIV. To describe the differential risk profiles associated with each of the mentioned outcomes.	Elandsdoorn: Sekhukhune District Municipality in Limpopo: SA	Cohort study	501 adult PLHIV on ART	a) Risk of virological failure was higher among responderents with moderate to severe depressive symptoms b) Depression and other mental health problems remain underdiagnosed and untreated among rural PLHIV c) Financial constrain remain a barrier to ART adherence d) There is an intereplay between gender, food insecurity	-Limited scope of covariates -Covariates of ART adherence were evaluated through self-report, which may have been affected by memory bias or social desirability -Practical limitation of conducting pill count

					and ART adherence	
Jardim et al (2022)	To evaluate the impact of COVID-19 pandemic on accessing HIV services at a PHC level in SA	Western Cape, KZN and Limpopo	Systematic review	11 studies	-Resilience in ART follow up and adherence differed between WC and KZN provinces -Telemedicine was used in the private and public sectors - Decrease in HIV services in public PHC facilities was reported -HIV services at private PHC were not affected	-36% of studies reported on data from single source of the District Health Information System(DHSI). Inclusion from other sources would highlight discrepancies -The review only reports on a minimum of three out of nine provinces of SA. Data from other provinces would allow beneficial conclusions for the whole country
Joska et al (2020)	To assess mental health risk amongst	Cape Town	Commentary	Women living with HIV	a) Prioritize Psychological	Recommendations would yield more

	WLHIV during COVID-19 period.				treatment as essential b) Combined effects may results in delayed access to HIV care, missing clinic appointments and poor medication adherence	validity if they were compared to other studies
Lambarey et al (2022)	To assess SARS-CoV-2 seroprevalence and its association with HIV related clinical parameters in non-hospitalized patients	Gugulethu: SA	Cohort study	150 non-hospitalized adult HIV infected patients	a) There is a convincing association between uncontrolled HIV viremia and SARS-CoV-2 seropositivity b) HIV infection increased the risk of COVID-19 related death rate, with patients not on ART being more likely to die in hospital than those	-Data derived from a single centre research and cannot be generalized to the entire HIV infected population and country

					on ART	
Mcinziba et al (2023)	To describe interactions between managing household income and ART adherence for PLHIV in low income and semi-urban settings in SA.	Western Cape: SA	Cohort (Trial)	21 adult PLHIV	-People prioritized basic needs over HIV care-related expenses which interfered with the ability of PLHIV to access or adhere to ART -PLHIV used minimal resources to buy substances such as drugs and alcohol to numb the emotional challenges of living with HIV -PLHIV would miss clinic appointments due to work commitments and the	Small analysed sample may not be generalized to other settings where social and health system contexts differ largely

					need to generate income	
Mendelsohn & Ritchwood (2020)	To outline the impact of the de-escalation of HIV program on HIV outcomes in South Africa during the first and second waves of COVID-19.	Western Cape: SA	Commentary	WC:DoH patients' data	a) Unsuppressed HIV patients in need of additional support are more likely to suffer as a result of lack of auxiliary services such as social workers, treatment support groups and psychotherapy. b) Discouraging non-essential health care visits will result in lower numbers of people who test for HIV and new diagnoses and low number of ART	Findings would have more validity if they were compared with findings from other studies

					initiation c) TLD was fast-tracked during COVID-19, and 6 months supply of ARVs was strongly advocated to minimise HIV patients' exposure to health care facilities and to facilitate ART adherence.	
Orr et al (2023)	To describe the impact of COVID-19 and related restrictions on district-level numbers of newly diagnosed people living with HIV and defaulting ART patients	Buffalo City Metropolitan Municipality: Eastern Cape:SA	Mixed methods. Primary data source: Quantitative and qualitative data	Patient data from 113 PHC facilities and in-depth interviews with 30 PHC facility staff members	a) Number of newly initiated ART patients decreased substantially compared to pre-COVID-19 levels. b) The overall number of patients who restarted ART increased in response	Data was gathered in relatively low patient burden rural PHC facilities and do not indicate urban or high patient burden facility experiences

			served as supplementary source		to fears of co-infection with Coronavirus. C) Loss of trained personnel and interruption of HIV services	
Roy et al (2022)	To analyse the impact of COVID-19 pandemic on efforts to control HIV in SA through social, behavioural and ethical perspectives.	South Africa	Systematic review	15 studies	a) During COVID-19 many provinces in SA recorded changes in the course of ART treatment. b) There is a cross-sectional correlation between practicing COVID-19 preventative behaviours and having a high adherence to	a) Synthesising and analysis of articles limited by availability of primary data on the study topic b) Challenges in the generalisability of the data

					ART.	
SeyedAlinagh et al (2023)	To investigate the impact of COVID-19 on service delivery and ART treatment outcome in PLWH	South Africa	Systematic review	16 studies	a) A concern over interruption in in-person visits and medical follow-up services, loss of adherence to treatment, and subsequent increase in mortality as a result of COVID-19 complications in PLHIV b) Other challenges were psychological disorders such as anxiety and depression, an increase in substance abuse and a rise in experienced	

					stigma and discrimination. a)Use of telemedicine may help	
Siedner et al (2020)	To evaluate whether implementation of lockdown orders in South Africa affected ambulatory clinic visitation in rural Kwa Zulu-Natal	South Africa	An interrupted time series analysis	11 Primary Health Care clinics	a)No change in total clinic visits during lockdown	Challenges in the generalizability of the data

Thematic analysis of selected studies

Thematic analysis was done according to Braun and Clarke (2006). After reading the abstracts, the researcher read the full articles to further acquaint themselves with the data. Following this, coding will then be done wherein researcher read and highlighted common words, expressions and findings within the data. From these, themes were created as illustrated in the Table 3. The thematic analysis yielded two themes namely: the impact of COVID-19 on HIV individuals and experiences of HIV individuals during COVID-19. From these two themes, three subthemes emerged.

Table 3: Themes and sub-themes that emerged from the selected studies

Theme	Sub-theme
Impact of COVID-19 on HIV individuals	Disruption to ART care
Experiences of HIV individuals during COVID-19	Psychological impact
	Social impact

Results

Some of the included studies showed that COVID-19 pandemic in SA has had a significant detrimental effect on the provision of ART and HIV services, which are intended to stop HIV progression and extend the life expectancy of PLWH, as evidenced in the reports on decreased HIV testing, positive HIV tests, and ART initiation (Campbell et al., 2022, Jardim, Zamani, & Akrami, 2022; SeyedAlinaghi et al., 2023). Although a resilience of ART provision was documented, indicating that adherence to treatment was sustained throughout the pandemic, and an indication that private healthcare was less affected by the pandemic; an overall decrease in HIV services was reported in the public healthcare system (Campbell et al., 2022, Jardim, Zamani, & Akrami, 2022). This, however, does not represent the entire nation because of the notable increase in HIV prevalence in the public sector brought about by social and economic inequality in SA.

The research examined the use of HIV services before the COVID-19 outbreak and during the lockdown. There were reports from some South African provinces, including KwaZulu-Natal, Limpopo, Gauteng and the Western Cape. The results demonstrated in data from a large number of clinic population in KwaZulu-Natal, that at the start of the COVID-19 lockdown there was approximately 50% drop in HIV testing and ART initiations; over the following three months, there was a progressive improvement towards pre-lockdown levels; the number of visits for ART collection decreased somewhat, but the number of missed visits increased momentarily (Siedner et al (2020); Dorward et al., 2021 Orr et al., 2023); with the exception of ART initiations, which continued to be low among men but steadily increased among women, these trends were not significantly impacted by age or gender. In general, the findings suggest that lockdown's effects on the rural clinics was less noticeable. These results imply that HIV services typically continued for individuals who were already on ART. The lockdown, especially in urban clinics, hindered the process of bringing new patients into care, primarily through HIV testing and treatment initiation (Dorward et al., 2021; Mciziba, 2023 & Orr et al 2023). The response PLWH on ART, whether adherent or defaulting, was mixed, with many ART and other chronic patients expressing fear of COVID-19. On the other hand, some facility staff claimed that COVID-19 had a positive effect on ART defaulting rates (Jardim, Zamani, & Akrami, 2022 & Orr et al., 2023).

Impact of COVID-19 on ART adherence

During COVID-19 era provinces in SA, including Limpopo reported changes in the course of ART treatment and modifications due to a concern over interruption of in-person visits, medical follow-up services, loss of adherence to treatment, and subsequent increase in mortality due to the anticipated COVID-19 complications in PLWH (Roy 2022 et al; Mciziba 2023 & SeyedAlinagh et al 2023). According to Joska (2020) & Campbell (2021) lockdown impacted ART adherence through multiple interconnected ways; and research revealed a interplay between gender, food insecurity and ART adherence (Gumede 2021 & Gumede 2023). Financial constrains remain a barrier to adherence as people prioritized basic needs over HIV care-related expenses which disrupted the provision of ART, which then affected adhere to ART;

and PLWH missed clinic appointments because they prioritised work, and there was a need to generate income (Gumede, 2023 & Mciziba, 2023). HIV testing and ART initiations were significantly impacted during the pandemic and a number of newly initiated ART patients lowered dramatically as compared to before COVID-19 (Dorward et al, 2021; Jardim, Zamani, & Akrami 2022; Roy 2022 & Orr et al 2023).

Disruption to care

According to the studies by Mendelsohn & Ritchwood (2020); Roy et al (2022) & Orr et al (2023) PLWH care was disrupted. For PLWH, ART must be administered continuously throughout life in order to manage the illness. Notwithstanding the potential benefits of ART, viral resistance may become a serious issue if regular adherence is not maintained. Adverse events (AE) resulting from ART side effects and medication toxicities may affect patients who experience unscheduled stops to ART especially in cases of reduced CD4 counts and weakened immune systems (Gumede, 2021; Lambarey et al 2022 & Roy et al 2022). In their study Roy et al. (2022) found that among a convenient sample of individuals receiving HIV and AIDS treatment services in Cape Town, over one-third of the participants encountered disruptions in their HIV care such as difficulty obtaining medications, inadequate service delivery or non-attendance at clinics. However, there was a cross-sectional link discovered in this study between increased ART adherence and engaging in COVID-19 prevention behaviours. Loss of trained personnel due to COVID-19 and CHW (Orr et al 2023) Following a notable decline in clinic attendance during the lockdown, The increased use could be a result of more people wanting certain services because they couldn't get them during the lockdown According to Siedner et al (2020); Dorward et al (2021) and Jardim, Zamani, & Akrami (2022) generally, rural clinics experienced fewer effects from the lockdown and were more successful in continuing to provide HIV care to patients who were already on ART, as was the case in of KwaZulu-Natal where there was a 20% rise in HIV visits above the baseline right away. During this time, urban clinics struggled more to start ART patients. An imbalance in supply and demand developed due to these ART disruptions, anticipating shortages in the availability of HIV treatment (Roy et al., 2022).

Experiences of HIV individuals during COVID-19

Studies in this review indicate that COVID-19 resulted in nationwide decline in the number of visits to public health facilities, with the Western Cape reporting the largest visit decline of 31.1% due to limitations placed during the lockdown era, fear of catching and spreading COVID-19 and the scarcity of healthcare services; this decline had a detrimental effect on national ART adherence (Campbell et al, 2021; Jardim et al 2022 & Orr et al, 2023). Dorward et al (2021) posited that individuals lacking regular healthcare behaviours were less likely to surmount lockdown obstacles and make clinic appointments. “They were afraid someone would discover that, yes, they are HIV + and have a weakened immune system” (Orr et al., 2023); “That means I will no longer be taking the medication for a few months or even a year”. “Most of the HIV-positive customers knew to come to the clinic in order to receive treatment since they were quite terrified of COVID-19”. With that said, the majority of our defaulters returned”. The total number of patients who restarted ART increased as a result of fears of co-infection with COVID-19 (Orr et al 2023). -Telemedicine was utilized in the private and public sectors and yielded positive results (Jardim, 2022 & SeyedAlinagh et al, 2023).

Psychological impact and Social impact

Study results indicated that COVID-19 had a psychological impact on HIV-positive people, and that the impact of lockdown on ART adherence was not equal and depended on a complex interplay of social, institutional, and individual factors (Joska et al 2020; Campbell, 2022 ; Jardim, Zamani, & Akrami, 2022 & Gumede et al. 2023). Participants from the study reported feeling anxious about access to health care, to support their ART adherence, and reported issues in getting medication (Joska et al, 2020).

In their study Dorward et al., (2021) found out that 56.63% of participants expressed fear about running out of HIV medications. The four weeks between the first confirmed case of COVID-19 in SA and the commencement of lockdown saw more ART collection trips than usual, even when seasonality was taken into consideration. The reason behind the anxiety that patients on ART have about co-infection with HIV

and Coronavirus was explained as follows: "It's because the news was saying if you are not taking your treatment, it will not be favourable to you", (Clerk for administration, Facility 7, January 29, 2021) (Orr et al, 2023). Even while it suggests that COVID-19 concerns motivated LTF ART patients to seek therapy, it appears that Coronavirus measures had a negative impact on both early missing and late missing ART patients. The clinic's management initially tried to lower the number of patients who came in to lower the danger of contracting COVID-19 from being around other people. Aged and patients on stable treatment (including ART) were highlighted in particular. Community health workers (CHWs) took medications to patients' homes. This was purportedly in addition to department of health programmes providing medication collection at locations external to health facilities to cater for registered stable patients (Orr et al., 2023). This study revealed that PLWH experienced challenges such as psychological disorders such as anxiety and depression; an increase in substance abuse; and a rise in experienced stigma and discrimination during COVID-19 (; Joska, 2020 & SeyedAlinaghi et al, 2023).

According to Campbell et al. (2022), mental health services were not exempt from the difficulties brought on by the COVID-19 to PLWH; data from the last few years indicated that the percentage of PLWH who experience sadness, anxiety, insomnia, and boredom has risen from 20 to 55%. Even though these patients' mental health problems were present prior the pandemic, a review suggests that the COVID-19 pandemic has made the disease worse; as a result, this problem may need to be addressed right away. Additionally, a review of the available data shows a connection between the decline in PLWH mental health services and other social issues like the disruption of services for treating illicit substance abuse, the rise in the use of illegal drugs (such as heroin, cocaine, sedatives, prescription opioids, and methamphetamine) from 10% to 18%, and an increase in recreational drug use (Mcizimba, 2023 & SeyedAlinaghi et al, 2023). Furthermore, Gumede (2023) reported that depression and other mental health problems remain underdiagnosed and often left not treated among rural PLWH and that psychological treatment be prioritised as an essential service (Joska et al, 2020).

Data from PLWH in Cape Town were analysed in a study with two main goals: first, determining whether baseline and follow-up differences (e.g., household income) existed in individual, social (household), and structural factors that influence ART adherence; second, looking at the correlates of ART adherence at follow-up (Campbell, 2022). The findings posited that lockdown would have an adverse effect on household functioning, mental well-being, and access to care, all of which would be connected to follow-up ART adherence. In contrast to previous studies, a surprising amount of evidence suggested that individual mental well-being had improved during the lockdown, with one-third of participants reporting feeling more depressed. However, Campbell et al, (2022) & SeyedAlinagh et al, (2023) found a correlation between improved mental health and more supportive home settings. Gumede et al (2023) discovered that whereas task-oriented coping score and family income were shown to be protective against insufficient pill-count adherence, depressive symptoms were found to be independently connected to virological failure in COVID-19 individuals living with HIV.

Discussion

This section discusses the findings of the study. The aim of the study was to systematically evaluate the impact of COVID-19 on ART adherence in HIV positive adults in SA. The findings provide proof that some HIV services have suffered as a result of the COVID-19 pandemic in SA. According to the studies by Siedner et al, (2020), (Jardim, Zamani, & Akrami, (2022) & Roy et al, (2022), HIV services were unaffected by the lockdown, especially on the private health care sector. This, however, does not represent the entire nation because of the notable increase in HIV prevalence in the public sector brought about by social and economic inequality in SA. The disparity in access to healthcare is further highlighted by these divergent results. This review found that throughout the lockdown period (27 March–28 December 2020), there was a general decline in HIV services provided by the public healthcare system possibly due to the lockdown imposed by the government of SA. In general, the lockdown's effects on the rural clinics were less noticeable (Jardim, Zamani, & Akrami, 2022 & Gumede, 2023), which imply that HIV services were mostly kept up for those who were already on ART. However, the lockdown made it more difficult to

get new patients into care, through HIV testing and ART initiation, especially in urban clinics (Dorward et al., 2021).

ART follow-up care accounted for the majority of HIV-related clinic visits in 2020. Western Cape-based cohort studies revealed a rise in the number of patients who skipped ART follow-up appointments (Campbell et al., 2022). Conversely, research conducted in KwaZulu-Natal revealed that HIV-related clinic visits were persistent during lockdown, particularly for follow-up care and ART collections (Dorward et al, 2021 & Siedner et al, 2020). KwaZulu-Natal is among the most under-served provinces, as was already established, and the Western Cape has more healthcare facilities per person than the population of the province (Jardim et al., 2022). Remarkably, more missed ART collection visits occurred in KwaZulu-Natal's urban clinics than in its rural ones (Dorward et al, 2021 & Roy, 2022). There are two possible theories: either urban migration played a part, or a stricter lockdown was imposed in urban regions. In SA, most people work in cities and reside in rural areas. It is possible that those who had moved to cities in search of employment came home during lockdown (Dorward et al, 2021 & Jardim, Zamani, & Akrami, 2022).

Although the usage of telemedicine substantially helped to improve the situation (SeyedAlinaghi et al, 2023), in-person visits; and clinical follow-up services appeared to be severely hampered by the COVID-19 pandemic in terms of healthcare provision and delivery. There was a brief rise in missed ART collection visits during the first month of the lockdown, indicating that the lockdown created some disturbance to ART collections. Overall ART collection visits in the study clinics did not significantly decline, though, as collections quickly resumed their pre-lockdown levels and the majority of those who missed a visit showed up the following month (Dorward et al, 2021 & Jardim, Zamani, & Akrami, 2022).

The results further indicate that among HIV-positive individuals, psychological effects were noticeable during the COVID-19 era. The data reveals that anxiety and depression were mentioned by the participants. The study finds that PLWH experienced anxiety regarding getting access to medical care to support their adherence to ART, as well as difficulties getting medication (Joska et al 2020;

Campbell, 2022; Jardim, Zamani, & Akrami, 2022 & Gumede et al. 2023). The results also imply that, although these mental health issues may have existed earlier, COVID-19 may have exacerbated them.

A consistent procedure where all tiers of health care related management are involved is key for the management of chronic infections such as HIV to achieve best results to ensure proper management of chronic illnesses in the face of any pandemic. There is little doubt that the COVID-19 has disrupted the world health care system to differing degrees, (SeyedAlinaghi et al., 2023); low- and middle-income countries (LMICs) were the majority of nations that saw the worst disruptions in the delivery of healthcare services. Therefore, the pandemic's effects on the provision of health care did not spare HIV infection management. The results indicate that although there was no discernible effect on viral suppression, there has been a decrease in PLWH adherence to ART, and it was noted that the pandemic's main non-HIV-related psychological problems were anxiety and depression (Joska et al 2020, & Jardim, Zamani, & Akrami, 2022).

Recommendations and limitations

In the future the primary goal should be to lessen the burden that infectious diseases place on individuals in society by addressing HIV epidemic and concurrent pandemics through policymaking. It is advised that health care services in SA be delivered differently to maintain service continuity and shield vulnerable groups from contracting COVID-19. This covers the provision of medication via non-medical facilities as well as community-based PrEP and ART distribution. Telephone support for CHWs and medical triaging could be provided to support HIV. HIV at-home self-testing may be used as to reduce the chance of coming into contact with COVID-19 as recommended in the 2020 WHO report. These suggestions, when combined with telemedicine, would reduce the number of trips to medical institutions and enable HIV services to continue during lockdowns. The government should make food and medication more accessible during the pandemic to promote ART adherence. It could also be quite advantageous to have access to support services for intimate partner violence (IPV).

As COVID-19 is a new phenomenon there are limited published sources for reference, the researcher inevitably had to include research sources published between the year 2020 and 2023. This limitation may affect the bias of the review. The review only reports on five out of nine provinces of SA. Data from other provinces would allow beneficial conclusions for the whole country.

Conclusion

The results reveal that SA has assumed a significant amount of responsibility in the handling of HIV/AIDS in recent times. Nonetheless, given the concurrent HIV epidemic, the introduction of COVID-19 has brought attention to ongoing areas for better care delivery, outcomes, and equity. These 13 articles described the ways in which the COVID-19 pandemic brought to light long-standing stigmas associated with HIV, communication phobias, disruptions in the medical supply chain, alternative care delivery models that impact insurance costs and medication distribution, and obstacles to accessing contraceptives. SA has to take proactive steps to avoid future delays and disruptions in healthcare services for individuals living with HIV, just as it has led the way in implementing cutting-edge methods of HIV care to overcome previous obstacles. We must keep looking into the past of our responses to public health emergencies, noting the advantages and disadvantages of every action made to advance the field's understanding of the illness while overseeing the provision of medical care (Roy et al., 2022).

List of references

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

Campbell, L. S., Masquillier, C., Knight, L., Delport, A., Sematlane, N., Dube, L. T., & Wouters, E. (2022). Stay-at-home: the impact of the COVID-19 lockdown on household functioning and ART adherence for people living with HIV in three sub-districts of Cape Town, South Africa. *AIDS and Behavior*, 2022(26), 1905-1922. <https://doi.org/10.1007/s10461-021-03541-0>.

Critical Appraisal Skills Programme. CASP Checklist. (2019). <https://casp-uk.net/casp-tools-checklists/> (accessed October 10, 2023).

Dorward, J., Khubone, T., Gate, K., Ngobese, H., Sookrajh, Y., Mkhize, S., ... & Garrett, N. (2021). The impact of the COVID-19 lockdown on HIV care in 65 South African primary care clinics: an interrupted time series analysis. *The Lancet HIV*, 8(3), e158-e165. [https://doi.org/10.1016/S2352-3018\(20\)30359-3](https://doi.org/10.1016/S2352-3018(20)30359-3).

Gumede, S. B., de Wit, J. B. F., Venter, W. D. F., & Lalla-Edward, S. T. (2021). Study protocol: Strengthening understanding of effective adherence strategies for first-line and second-line antiretroviral therapy (ART) in selected rural and urban communities in South Africa. *Plos one*, 16(12), e0261107. <https://doi.org/10.1371/journal.pone.0261107>.

Gumede, S. B., Wensing, A. M., Lalla-Edward, S. T., de Wit, J. B., Francois Venter, W. D., Tempelman, H. A., & Hermans, L. E. (2023). Predictors of Treatment Adherence and Virological Failure Among People Living with HIV Receiving Antiretroviral Therapy in a South African Rural Community: A Sub-study of the ITREMA Randomised Clinical Trial. *AIDS and Behavior*, 2023(27) 3863-3885. <https://doi.org/10.1007/s10461-023-04103-2>

Jardim, C. G. R., Zamani, R., & Akrami, M. (2022). Evaluating the impact of the COVID-19 pandemic on accessing HIV services in South Africa: a systematic review. *International Journal of Environmental Research and Public Health*, 19(19), 11899. <https://doi.org/10.3390/ijerph/191911899>.

Joska, J. A., Andersen, L., Rabie, S., Marais, A., Ndwandwa, E. S., Wilson, P., ... & Sikkema, K. J. (2020). COVID-19: increased risk to the mental health and safety of women living with HIV in South Africa. *AIDS and Behavior*, 2020(24), 2751-2753. [https:// doi.org/10.1007/s10461-020-02897-z](https://doi.org/10.1007/s10461-020-02897-z).

Lambarey, H., Blumenthal, M. J., Chetram, A., Joyimbana, W., Jennings, L., Tincho, M. B., ... & Schäfer, G. (2022). SARS-CoV-2 Infection Is Associated with Uncontrolled HIV Viral Load in Non-Hospitalized HIV-Infected Patients from Gugulethu, South Africa. *Viruses*, 14(6), 1222. [https:// doi.org/10.3390/v14061222](https://doi.org/10.3390/v14061222).

Mcinziba, A., Bock, P., Hoddinott, G., Seeley, J., Bond, V., Fidler, S., & Viljoen, L. (2023). Managing household income and antiretroviral therapy adherence among people living with HIV in a low-income setting: a qualitative data from the HPTN 071 (PopART) trial in South Africa. *AIDS Research and Therapy*, 20(1), 54. [https:// doi.org/10.1186/s12981-023-00549-5](https://doi.org/10.1186/s12981-023-00549-5).

Mendelsohn, A. S., & Ritchwood, T. (2020). COVID-19 and antiretroviral therapies: South Africa's charge towards 90–90–90 in the midst of a second pandemic. *AIDS and Behavior*, 2020(24), 2754-2756. [https:// doi.org/10.1007/s10461-020-02898-y](https://doi.org/10.1007/s10461-020-02898-y)

Orr, N. M., Hajiyanis, H., & Motuba, T. (2023). COVID-19 impact on newly initiated and restarted antiretroviral treatment patients in the Eastern Cape, South Africa. *African Journal of Primary Health Care & Family Medicine*, 15(1), 3811. [https:// doi.org/10.https://hdl.handle.net/10520/ejc-phcfm_v15_n1_a3811](https://doi.org/10.https://hdl.handle.net/10520/ejc-phcfm_v15_n1_a3811).

Page, M.J.; McKenzie, J.E.; Bossuyt, P.M.; Boutron, I.; Hoffmann, T.C.; Mulrow, C.D.; Shamseer, L.; Tetzlaff, J.M.; Akl, E.A.; Brennan, S.E.; et al. The PRISMA 2020 statement:

An updated guideline for reporting systematic reviews. *BMJ*, 372(71), [Google Scholar] [CrossRef]

Roy, K., Himelfarb, A., Karrah, K., Porterfield, L., Paremoer, L., Serag, H., & Lee, W. C. (2022). The Social, Behavioral, and Ethical Modalities of COVID-19 on HIV Care in South Africa: A Systematic Review. *International Journal of Environmental Research and Public Health*, 19(15), 9766. <https://doi.org/10.3390/ijerph19159766>.

SeyedAlinaghi, S., Mirzapour, P., Pashaei, Z., Afzalian, A., Tantuoyir, M. M., Salmani, R., ... & Dadras, O. (2023). The impacts of COVID-19 pandemic on service delivery and treatment outcomes in people living with HIV: a systematic review. *AIDS Research and Therapy*, 20(1), 4. <https://doi.org/10.1186/s12981-022-00496-7>.

Siedner, M.J.; Kraemer, J.D.; Meyer, M.J.; Harling, G.; Mngomezulu, T.; Gabela, P.; Dlamini, S.; Gareta, D.; Majozi, N.; Ngwenya, N. (2020). Access to primary health care during lock down measures for COVID-19 in rural South Africa: An interrupted time series analysis. *BMJ Open*, 10(10) e043763. doi: 10.1136/bmjopen-2020-043763.

Tawfik, G. M., Dila, K. A. S., Mohamed, M. Y. F., Tam, D. N. H., Kien, N. D., Ahmed, A. M., & Huy, N. T. (2019). A step by step guide for conducting a systematic review and meta-analysis with simulation data. *Tropical medicine and health*, 47(1), 1-9. <https://doi.org/10.1186/s41182-01990165-6>.

World Health Organisation. (2020). Pulse survey on Continuity of Essential Health Services during the COVID-19 Pandemic. https://www.who.int/publications/i/item/WHO-2019-nCoV-EHS_continuity-survey-2020.1 (accessed October 31, 2023).

2.3 Author Guidelines for South African Journal of Psychology

New submissions should not exceed 5500 words, including references, tables, figures, etc. Authors of manuscripts returned for revision and extension should consult the Editorial Office regarding amended length considerations.

All manuscripts should be written in English and include an abstract of not more than 250 words. The writing must be of a high grammatical standard, and follow the technical guidelines stipulated below. The publication guidelines of the American Psychological Association 7th edition (APA 7th) must be followed in the preparation of the manuscript. Manuscripts of poor technical or language quality will be returned without review.

4. Preparing your manuscript for submission

4.1 Formatting

Manuscripts should be submitted as a Word document only. Templates are available on the Manuscript Submission Guidelines page of our Author Gateway.

The text should be double-spaced throughout and with a minimum of 3cm for left and right hand margins and 5cm at head and foot. Text should be standard 12 point.

4.2 Journal Style

The South African Journal of Psychology conforms to the Sage house style. Click [here](#) to review guidelines on Sage UK House Style.

Research-based manuscripts should use the following format: The introductory/literature review section does not require a heading, thereafter the following headings /subheadings should be used:

Method (Participants; Instruments; Procedure; Ethical considerations; Data analysis (which includes the statistical techniques or computerized analytic programmes, if applicable); Results; Discussion; Conclusion; References.

The “Ethical considerations” section must include the name of the institution that granted the ethical approval for the study (if applicable).

4.3 Keywords and abstracts

Helping readers find your article online Authors should include (a) an Abstract of up to 250 words and (b) up to 6 alphabetised keywords. The title, keywords and abstract are key to ensuring readers find your article online through online search engines such as Google. Please refer to the information and guidance on how best to title your article, write your abstract and select your keywords by visiting Sage’s Journal Author Gateway Guidelines on How to Help Readers Find Your Article Online.

4.4 Artwork, figures and other graphics

For guidance on the preparation of illustrations, pictures and graphs in electronic format, please visit Sage’s Manuscript Submission Guidelines.

Figures supplied in colour will appear in colour online regardless of whether or not these illustrations are reproduced in colour in the printed version. For specifically requested colour reproduction in print, you will receive information regarding the costs from Sage after receipt of your accepted article.

4.5 Supplementary material

The South African Journal of Psychology does not currently accept supplemental files.

4.6 Reference style

South African Journal of Psychology adheres to the APA reference style. View the APA guidelines to ensure your manuscript conforms to this reference style.

4.7 English language editing services

Authors seeking assistance with English language editing, translation, or figure and manuscript formatting to fit the journal's specifications should consider using Sage Language Services. Visit Sage Language Services on our Journal Author Gateway for further information.

5. Submitting your manuscript

The South African Journal of Psychology is hosted on Sage Track, a web based online submission and peer review system powered by ScholarOne™ Manuscripts. Visit <http://mc.manuscriptcentral.com/sap> to login and submit your article online.

IMPORTANT: Please check whether you already have an account in the system before trying to create a new one. If you have reviewed or authored for the journal in the past year it is likely that you will have had an account created. For further guidance on submitting your manuscript online please visit ScholarOne Online Help.

5.1 ORCID

As part of our commitment to ensuring an ethical, transparent and fair peer review process Sage is a supporting member of ORCID, the Open Researcher and Contributor ID. ORCID provides a unique and persistent digital identifier that distinguishes researchers from every other researcher, even those who share the same name, and, through integration in key research workflows such as manuscript and grant submission, supports automated linkages between researchers and their professional activities, ensuring that their work is recognized.

The collection of ORCID iDs from corresponding authors is now part of the submission process of this journal. If you already have an ORCID iD you will be asked to associate that to your submission during the online submission process. We also strongly encourage all co-authors to link their ORCID ID to their accounts in our online peer review platforms. It takes seconds to do: click the link when prompted, sign into your ORCID account and our systems are automatically updated. Your ORCID iD will become part of your accepted publication's metadata, making your work attributable to you and only you. Your ORCID iD is published with your article so that fellow researchers reading your work can link to your ORCID profile and from there link to your other publications.

If you do not already have an ORCID iD please follow this link to create one or visit our ORCID homepage to learn more.

5.2 Information required for completing your submission

You will be asked to provide contact details and academic affiliations for all co-authors via the submission system and identify who is to be the corresponding author. These details must match what appears on your manuscript. At this stage please ensure you have included all the required statements and declarations and uploaded any additional supplementary files (including reporting guidelines where relevant).

5.3 Permissions

Please also ensure that you have obtained any necessary permission from copyright holders for reproducing any illustrations, tables, figures or lengthy quotations previously published elsewhere. For further information including guidance on fair dealing for criticism and review, please see the Copyright and Permissions page on the Sage Author Gateway.

2.4 Manuscript 2

Title of the manuscript: The impact of COVID-19 on HIV patients who are on ART in Vhembe district, Limpopo Province, South Africa.

South African Journal of Psychology: For Review.

The impact of COVID-19 on hiv patients who are on art in Vhembe District, Limpopo Province, South Africa

Moyo Ramasela Anna: Department of Psychology, Faculty of Health Sciences, University of Venda, Thohoyandou, South Africa. Email: ramaselamoyo@gmail.com

Maphula Angelina: Department of Psychology, Faculty of Health Sciences, University of Venda, Thohoyandou, South Africa. Email: Angelina.Maphula@univen.ac.za

Makhado Lufuno: Department of Public Health, Faculty of Health Sciences, University of Venda, Thohoyandou, South Africa. Email: Lufuno.Makhado@univen.ac.za

Abstract

People with pre-existing mental health conditions may be more susceptible to stressors that are related to COVID-19. It is important to understand the psychosocial impact of COVID-19, particularly for people living with HIV, as they are to an extent already at risk for common mental disorders such as depression and anxiety, and poor mental health is a predictor of negative human immunodeficiency virus related outcomes. This study aimed to assess the impact of COVID-19 on HIV patients who are on antiretroviral therapy at 2 health centres namely, Makhado and Bungeni at Makhado local municipality, in Vhembe district. The study was quantitative, cross-sectional in nature. Self administered questionnaires were used to evaluate concerns about COVID-19, general health and coping with COVID-19 of 285 adult PLWH on ART; the Statistical Package of Social Sciences was used to analyse data. Descriptive and inferential statistics included cross tabulation and the independent t-test was used to analyse the data. The findings highlight a substantial 34,4% of respondents being afraid of COVID-19 and 14,1% also agreeing, implying the almost half of the respondents experiences anxiety. 47.1% reported being afraid to die COVID-19 and 35.2% struggling to sleep due to worrying about COVID-19. Although the PROMIS 10 scale reflect 64.4% and quality of life was reported to be high, the COPE scale highlight 2,8% used alcohol and durgs to cope, 3,5% used binge eating to cope. The majority reported more positive adaptive ways to cope such as eating healthy, taking break from social media, excircising and connecting with other people. Gender had no significant influence on feeling anxious, depressed and irritable, $M = 11.1869$, $SD = 8.6411$) were not significantly different in level of irritability, anxiety and depression $t(285) = -0.527$, $P < .599$ compared males ($M = 10.7813$, $SD = 8.0366$). The result implies that gender has no significant influence on anxiety, irritability and depression. The health system implementors in SA need to classify psychological treatment as essential to be as swiftly as general health response to improve the health and wellbeing for PLWH during COVID-19.

Key words: ART, COVID-19, HIV, PLWH, South Africa

Introduction

The first cluster of flu-like symptoms associated with COVID-19 was reported by the People's Republic of China in December 2019. In January 21, 2020, Washington State in the USA reported the first case of COVID-19, which the World Health Organization (WHO) later classified as a global pandemic in 01, March 2020 (World Health Organization, 2020). The first case of COVID-19 in South Africa was reported on the 5th March 2020, President Cyril Ramaphosa declared a national state of emergency on 15th March (Campbell et al, 2022; this was shortly followed by a national lockdown on 27th March which was known as one of the strictest in the world. The lockdown in SA moved across levels one to five, depending on the number of infected people, the management of the pandemic fatalities and the capacity of healthcare facilities. Health care facilities and designated essential service areas remained open throughout the lockdown (Campbell, 2022).

To battle the pandemic, SA like other countries such as the United States, established social isolation policies in order to slow the virus' spread and make sure hospitals didn't overbook their beds. The popular non-pharmaceutical interventions against COVID-19 at the time was social distance. However, it has also been demonstrated that this intervention has widespread detrimental impacts on mental health (Slaughter, 2021).

Better mental health was linked to more supportive household environments (Campbell, 2022); whilst an increase in household tension was predicted in SA due to the history of HIV stigma towards PLWH which adversely affected their mental health; HIV is still highly stigmatized as such it may be challenging for PLWH to adhere to ART treatment when household members are confined

together and medication cannot be taken in secret. The study by Campbell (2022) found evidence of some improvement in indicators for household functioning, household HIV competency and household HIV stigma during lockdown. According to Campbell (2022) the lockdown may have created a focus space for feelings of togetherness and thereby strengthened relationships in these households, while the mental health of patients with less supportive households suffered.

COVID-19 is seen as a traumatic event since it has disrupted regular life; and stressors associated with the COVID-19 pandemic are now more widely understood to have negative health effects (Slaughter, 2021). Slaughter (2021) further indicated that the loss of a loved one; the worry of getting infected with COVID-19; social isolation stress; job loss, housing difficulties and a lower quality of life can contribute to COVID-19 stress. Post-traumatic stress disorder (PTSD), guilt, anxiety, sadness, and depressive symptoms are just a few of the reactions to traumatic situations that people may experience. There is evidence that these psychosocial deficits lead to lower drug compliance (Esteves et al., 2021).

COVID-2019 has further led to an unprecedented interruption of peoples' lives and health care across the globe. Al Dhaheri et al. (2021) argued that COVID-19 affected HIV treatment because of stay-home orders. According to Sun et al. (2020), in China PLWH, who were already affected by stigma, psychosocial distress and sub-optimal adherence, experienced challenges and barriers to optimal health care due to COVID-19. Mcinziba, Bock, Hoddinott, Seeley, Bond, Fidler & Viljoen (2023) indicated that a large number of PLWH live below the breadline and are more likely to prioritize basic needs over HIV care-

related expenses which interfered with the ability of PLHIV to access or adhere to ART.

It was acknowledged that COVID-19 is disrupting HIV services in the Southern African Development Community (SADC) region, and that could lead to an additional 500000 AIDS related deaths (Olufadewa, 2021). A review of literature by Prabhu et al. (2020) found that HIV care delivery has been negatively affected by COVID-19. The same view is shared by Shi et al. (2021), whose study revealed that COVID-19 negatively impacted the HIV health care systems in China.

The study by Dorward et al. (2021) indicates that in Africa, the impact of HIV services during COVID-19 era is of particular concern because HIV is still one of causes of high death rate, with more than 400 000 deaths reported in the African continent in 2019. The Sub-Saharan Africa used aggressive enforcement of COVID-19 rules. For example, it is estimated that over 70000 people were arrested for breaking rules and the government used drones to take photos of unlicensed gathering in Uganda (Muziamba, 2021). Sub-Saharan Africa (SSA) effected strict measures despite being the most affected region with HIV.

According to SeyedAlinaghi, Mirzapour, Pashaei, Afzalian, Tantuoyir, Salmani, R, ...& Dadras (2023) Chronic diseases account for about 60% of all deaths worldwide; HIV is one of the leading causes of death worldwide, with about 690,000 people dying each year; and the global efforts to combat HIV have been hampered since the outbreak of the coronavirus. The health implications of COVID-19 coinfection for people living with HIV (PLWH) were not well understood in early 2020, There was a concern about a virus that was known to

have adverse outcomes for those with comorbidities, (Campbell 2022). A study conducted from March to June 2020 using data from the Western Cape indicated an association between HIV and COVID-19 mortality (Campbell).

According to Orr, Hajjiannis & Motuba (2023), the overall number of patients who restarted ART increased in response to fears of co-infection with Coronavirus.

Furthermore, during COVID-19 there was a lot of fear about contracting the disease in the absence of a vaccine or scientifically proven treatments to address symptoms and prevent death, such fear and anxiety also had implications for mental health and promoted disease-related stigma (Chenneville et al., 2020). There is also emerging evidence of stigma and discrimination related to COVID-19 amongst PLWH.

Mental health issues such as anxiety, depression, and post-traumatic stress and substance use are common among PLWH with mental health issues and are considered both a cause and a consequence of HIV; and the fear of COVID-19 in general can worsen existing mental health disorders and also may result in new diagnoses (Chenneville et al., 2020).

Over 25.6 million people are currently living with HIV in SSA, accounting for two-thirds of the recent overall world HIV infections and more than 70 percent of all AIDS and related deaths (Amuche et al., 2017). In South Africa, HIV prevalence was estimated at 14% in 2017 among the general population of all ages and over half the population still lives in poverty (Campbell, 2022). According to Binagwaho & Mathewos (2020) South Africa is one of the countries which implanted the strictest lockdowns. The lockdown was applied to everyone including individuals with chronic conditions, including the

immunocompromised people (Tikkanen et al., 2020).

The preceding measures were implemented despite revelations in the study by Pillay-van Wyk et al. (2019) of 7.97 million South Africans living with HIV. A study by Hogan (2020) found that the significant impact of COVID-19 on HIV was estimated to be from interruption to ART, which could occur during a period of high health system demand. The above finding raises a lot of questions such as whether PLWH continued to receive all the necessary support and help during COVID-19 pandemic. The answer remains hidden in obscurity; hence the purpose of this study will be to investigate the impact of COVID-19 on HIV patients who are on ART. A scoping analysis that was released in May 2021 found that fewer than 8% of the research that investigated the effects of COVID-19 on PLWH was qualitative or quantitative and that over 70% of the studies examined clinical outcomes (Waterfield, 2021). Understanding the social effects of COVID-19 and how the mental health of PLWH was influenced by the disruptions of service delivery, socio-economic worries, and the implementation of social distance rules is equally as significant as, if not more so than these contributions (Waterfield, 2021).

To address this gap in knowledge, the researcher aims to do a quantitative research to assess the impact of COVID-19 on HIV patients who are on ART. In addition to better understanding how the pandemic affected daily life, the study also aims to determine social, psychological and physical variables that shielded PLWH through COVID-19 period. Findings from this study can guide future research and service delivery from a strengths-based and resilient

approach, and they will add to the growing body of information about stress and coping during the epidemic.

Method

Participants

Participants in this study were regular HIV positive adults aged 18 years and above, who received HIV testing services and were on ART during COVID-19 period and accessed treatment at selected health centres; and are on the ART treatment register. The respondents were both males or females who could speak or read Tshivenda and Xitsonga or English language. A sample of 285 respondents were randomly selected. The majority of respondents resided in rural areas (98.9%), 89,5% were of African origin and the ethnicity divided between Venda and Tsonga. There was a slight female majority of 59.6%, with a significant portion of respondents (37%) with no schooling. The employment status reflected 41.7% working and an unemployment rate of 34.5%.

Instruments

The self-administered questionnaires from similar studies on COVID-19 namely, Study VIII: The impact of the COVID-19 pandemic on people with HIV were used to collect data for the study. The questionnaires were adapted and permission for use was sought from authoring personnel or institutions of the instruments, and selected scales in the questionnaire aligned to the study objectives were used. Section A comprised of demographic information, Section B comprised of the following scales: Self-Reported of Concern COVID-19; PROMIS 10 and COPE.

The concern about COVID-19 questionnaire comprised of 7 questions. The questions were asking about concern patients have about COVID-19 within the last 12 months and in the last 30 days. The PROMIS 10 measures perceptions of general health, quality of life, physical and mental health, social activities, and fatigue among respondents. PROMIS 10, the Patient-Reported Outcomes Measurement Information System (PROMIS) has been widely used (Cella, Riley, Stone, Rothrock, Reeve....Hays, 2010); The internal consistency reliabilities of all composite scores were satisfactory with a Cronbach's alpha of 0.69-0.91. COPE survey was used to assess the way the pandemic affected people's lives, particularly their mental health and coping strategies. The Cronbach's alpha of the previous study which used COVID-19 Participant Experience (COPE) survey was 0.86 after reverse scaling and it was satisfactory (Cook, Wood, Risner, Weng and Xin, 2023). The English version of the questionnaire was translated to Tshivenda and Xitsonga languages to cater for the language needs of the respondents and to ensure comprehension of the instruments and accurate responses. Language specialist translated the instrument and field experts reviewed for consistency and deliberated to accommodate the various dialects.

Procedure

The nursing staff working in HIV clinic within the health centres assisted with identifying and recruiting PLWH who came for treatment in both clinics. The register was used to randomly select potential respondents and those willing to provide consent were then selected. The researcher used a private consulting room allocated for data collection for privacy. The interested and willing patients were provided with the information letter (Annexure A) to familiarize

themselves with the study and how the data collection process would unfold. After that, they were provided with the consent form (Annexure B) to consent to participate in the study.

The data collection yielded 285 participants comprising of males and females aged 18 and above. Each participant took approximately 30 -35 minutes to complete the questionnaire. The researcher protected the identity of the participants by using the codes instead of real names, COVID-19 protocols were observed throughout the process of data collection.

Ethical considerations

The ethics committee of the University of Venda granted the researcher an ethical clearance prior commencement of data collection. Secondly, the researcher was granted approval by the Limpopo Provincial health department to conduct research with patients in the health facilities (see attached permissions). Participants were informed that their participation was voluntary and that research was independent of treatment at the clinics. Confidentiality and privacy were ensured. Respondents were informed about psychosocial services at their disposal if a need arises during or after data collection. No identifying information was recorded, all respondents were allocated codes instead of identifying information.

Data analysis

The data from the questionnaires was coded into a Microsoft Excel spreadsheet before being uploaded to IBM SPSS software version 29.0 for analysis. Descriptive statistical was used to summarize the data and the results were

presented in a frequencies, tables and percentages. Inferential statistics through cross tabulation, Chi square and Phi and Cramer's V test were also utilised to test for association, effects and size at .05 level of significance. Descriptive statistical analysis was done to determine the prevalence; Inferential statistics were utilised to determine the association between demographic characteristics; ART medication adherence and coping. The researcher ensured the safekeeping of the data collected.

Results

Demographic Characteristics

The demographic data reveal significant variations in age, geographical location, race, ethnicity, gender, and educational attainment among the participants from selected health centres. Most participants are 40-49 years old, indicating a mature cohort. The overwhelming majority reside in rural areas (98.9%), with a pronounced representation of African origin (89.5%) and ethnicity primarily divided between Venda and Tsonga. The gender distribution is relatively balanced, with a slight female majority (59.6%). Educational levels are diverse, yet a significant proportion has no schooling (37.0%), highlighting educational disparities. Employment status further reflects 41.7% working and 34.5% unemployed, underscoring the pandemic's influence on employment. To an extent that COVID-19 is affecting marginalized communities in unique ways, and affects PLWH in unique ways. The level of education, unemployment rate and the economic disadvantage of the sample shows an indication of continued and apparent existing health disparities that has existed within the HIV epidemic pre-COVID-19.

Table 1: Demographic characteristics

Characteristics	Bungeni N (%)	Makhado N(%)	Total N(%)
Age categories			
20-29 yrs	16 (9,4%)	14(12,3%)	30(10,5%)
30-39 yrs	38(22,2%)	28(24,6%)	66(23,2%)
40-49 yrs	50(29,2%)	35 (30,7%)	85(29,8%)
50-59 yrs	32(18,7%)	20(17,5%)	52(18,2%)
60-69 yrs	31(18,1%)	13(11,4%)	44(15,4%)
70/79 yrs	4(2,3%)	3(2,6%)	7(2,5%)
80+ yrs	0(0,0%)	1(0,9%)	1(0,4%)
Geographical location			
Urban (city)	2(1,2%)	0(0,0%)	2(0,7%)
Suburban (around a city)	0(0,0%)	1(0,9%)	1(0,4%)
Rural	169(98,8%)	113(99,1%)	282(98,9%)
Are you of African origin?			
No	20(11,7%)	10(8,8%)	30(10,5%)
Yes	151(88,3%)	104(91,2%)	255(89,5%)
Race			
African	171(100,0%)	112(99,1%)	283(99,6%)
White	0(0,0%)	1(0,9%)	1(0,4%)
Ethnicity			
Venda	47(27,5%)	107(95,5%)	154(54,4%)
Tsonga	124(72,5%)	3(2,7%)	127(44,9%)
Other	0(0.0%)	2(1,8%)	2(0,7%)
Gender			
Male	69(40,4%)	46(40,4%)	115(40,4%)
Female	102(59,6%)	68(59,6%)	170(59,6%)

Highest level of education

No schooling	78(45,6%)	27(23,9%)	105(37,0%)
Some primary/elementary schooling	8(4,7%)	7(6,2%)	15(5,3%)
Completed primary/elementary school	10(5,8%)	6(5,3%)	16(5,6%)
Some secondary/high school	32(18,7%)	25(22,1%)	57(20,1%)
Completed Secondary/high school	25(14,6%)	30(26,5%)	55(19,4%)
Some technical/voca or univer educatio	10(5,8%)	9(8,0%)	19(6,7%)
Completed Technical/voca educatio	4(2,3%)	1(0,9%)	5(1,8%)
Bachelor/Honours Degree	4(2,3%)	6(5,3%)	10(3,5%)
Master's Degree or higher	0(0,0%)	2(1,8%)	2(0,7%)

We would like to know about what you do - are you working now, looking for work,

Working now	79(46,1%)	40(30,0%)	119(41,7%)
Unemployed	65(38,0%)	33(28,9%)	98(34,5%)
Retired	12(7,0%)	11(9,6%)	23(8,1%)
Keeping house	9(5,2%)	18(15,7%)	27(9,5%)
Student	0(0,0%)	6(5,3%)	6(2,1%)
Other	3(1,7%)	2(1,7%)	5(1,7%)

Specification of other

Grant	2(1,2%)	0(0,0%)	2(0,7%)
Self-employed	0(0,0%)	2(1,7%)	2(0,7%)
social grant	1(0,6%)	0(0,0%)	1(0,4%)

Concern About COVID-19

Responses to the Fear of COVID-19 Scale indicate varied levels of concern, discomfort, and physical reactions when contemplating COVID-19. A significant portion of participants report being moderately to severely afraid of COVID-19, with emotional and physical reactions such as clamminess, palpitations, and anxiety, especially when exposed to related news on social media. A substantial 34.4% of respondents strongly agree with being afraid of COVID-19, reflecting high levels of concern, and the risk of exposure to COVID-19 when attending medical appointments. This fear is also linked to sleep disturbances for some, suggesting a considerable psychological impact. There were also some reports in terms of physical reactions where 50.2% report neutrality (N) when considering if their hands became clammy thinking about COVID-19, suggesting mixed physical reactions to the pandemic stress.

Objective 1: To determine the level of concern about COVID-19 AND general health among PLWH

Table 2: Concern About COVID-19 [Fear of COVID-19 Scale]

	Bungeni	Makhado	Total
	N(%)	N(%)	
1. I am afraid of COVID-19			
SD	17(10,4%)	7(6,6%)	24(8,9%)
D	7(4,3%)	4(3,8%)	11(4,1%)
N	54(32,9%)	50(47,2%)	104(38,5%)
A	28(17,1%)	10(9,4%)	38(14,1%)
SA	58(35,4%)	35(33,0%)	93(34,4%)
2. It makes me feel uncomfortable to think about COVID-19			
SD	24(15,8%)	4(4,0%)	28(11,1%)
D	5(3,3%)	5(5,0%)	10(4,0%)
N	50(32,9%)	59(59,0%)	109(43,3%)
A	34(22,4%)	18(18,0%)	52(20,6%)
SA	39(25,7%)	14(14,0%)	53(21,0%)
3. My hands become clammy when I think about COVID-19			
SD	23(14,7%)	2(2,0%)	25(9,7%)
D	7(4,5%)	8(7,9%)	15(5,8%)

N	59(37,8%)	70(69,3%)	129(50,2%)
A	33(21,2%)	8(7,9%)	41(16,0%)
SA	34(21,8%)	13(12,9%)	47(18,3%)

4. I am afraid of losing my life because of COVID-19

SD	23(14,8%)	2(2,0%)	25(9,9%)
D	5(3,2%)	4(4,1%)	9(3,6%)
N	47(30,3%)	53(54,1%)	100(39,5%)
A	35(22,6%)	12(12,2%)	47(18,6%)
SA	45(29,0%)	27(27,6%)	72(28,5%)

5. When watching news and stories about COVID- 19 on social media, I become nervous or anxious

SD	24(14,8%)	1(1,0%)	25(9,5%)
D	4(2,5%)	5(5,0%)	9(3,4%)
N	53(32,7%)	70(70,0%)	123(46,9%)
A	41(25,3%)	13(13,0%)	54(20,6%)
SA	40(24,7%)	11(11,0%)	51(19,5%)

6. I cannot sleep because I'm worrying about getting COVID-19

SD	26(16,3%)	4(4,2%)	30(11,7%)
D	6(3,8%)	9(9,4%)	15(5,9%)
N	54(33,8%)	67(69,8%)	121(47,3%)
A	40(25,0%)	7(7,3%)	47(18,4%)
SA	34(21,3%)	9(9,4%)	43(16,8%)

7. My heart races or palpitates when I think about getting COVID-19

SD	27(17,3%)	4(4,3%)	31(12,4%)
D	7(4,5%)	7(7,5%)	14(5,6%)
N	50(32,1%)	65(69,9%)	115(46,2%)
A	40(25,6%)	8(8,6%)	48(19,3%)
SA	32(20,5%)	9(9,7%)	41(16,5%)

Overview of responses

In most questions, Bungeni residents tends to show higher percentages of agreement than Makhado residents.

Highest Disagreement:

Makhado residents shows significantly higher neutral responses, especially in Questions 3 and 6, indicating possible desensitization or lower anxiety levels compared to Bungeni residents.

Trends Observed

Fear and Anxiety Levels:

There is a notable level of fear and anxiety across both groups, particularly in responses to Questions 1 and 4, where more than 50% agreed that they fear COVID-19 and losing their lives due to it.

Questions involving physical symptoms (e.g., clammy hands, heart racing) also reflect significant concern, though fewer people reported such physical reactions.

Comfort with Media:

Question 5 indicates that a considerable number of respondents become anxious when consuming COVID-19-related news, highlighting the psychological impact of media exposure.

Neutral Responses:

High neutral response rates (N) in many questions suggest ambivalence or a lack of strong feelings among some respondents, particularly in Group 2 (Makhado residents).

Conclusion

General sentiment: There is a clear trend of anxiety and fear regarding COVID-19 across both groups, although Group 1 appears more affected than Group 2.

Impact of media: The influence of media on feelings of anxiety is evident and may warrant further investigation or targeted interventions.

Further analysis: It might be useful to explore demographic variables (age, gender, etc.) to better understand the underlying factors contributing to these trends.

General Health Perceptions

The PROMIS 10 results illustrate perceptions of general health, quality of life, physical and mental health, social activities, and fatigue among participants. Concerning general health rating, 57.1% from Bungeni and 40.2% from Makhado rate their general health as good, indicating relatively positive health perceptions despite the pandemic.

This was also observed regarding quality of life, where 58.6% from Bungeni and 43%

from Makhado consider their quality of life as good, which is a positive indicator amidst the pandemic. Most participants rated their general health as good, yet the responses also highlighted concerns about quality of life and fatigue. Mental health ratings suggest a mixed impact, with a significant portion reporting good mental health despite the pandemic's challenges. The effects of isolation resulting from restricted mobility associated with the COVID-19 perpetuated the respondents' rate of mental health issues such as anxiety and depression.

Objective 1: To determine the level of concern about COVID-19 and general health among PLWH

Table 3: General Health [PROMIS 10]

		Bungeni	Makhado	Total
		N(%)	N(%)	N(%)
General Health	Poor	4(2,5%)	6(5,4%)	10(3,6%)
	Fair	16(9,8%)	11(9,8%)	27(9,8%)
	Good	93(57,1%)	45(40,2%)	138(9,8%)
	Very good	19(11,7%)	20(17,9%)	39(50,2%)
	Excellent	31(19,0%)	30(26,8%)	61(14,2%)
Quality of life	Poor	5(3,3%)	4(4,0%)	9(3,6%)
	Fair	111(7,2%)	9(9,0%)	20(7,9%)
	Good	89(58,6%)	43(43,0%)	132(52,4%)
	Very good	16(10,5%)	17(17,0%)	33(13,1%)
	Excellent	31(20,4%)	27(27,0%)	58(23,0%)
Physical health	Poor	4(2,6%)	3(2,9%)	7(2,7%)
	Fair	15(9,6%)	11(10,6%)	26(10,0%)
	Good	92(59,0%)	47(45,2%)	139(53,5%)

	Very good	15(9,6%)	15(14,4%)	30(11,5%)
	Excellent	30(19,2%)	28(26,9%)	58(22,3%)
Mental health	Poor	5(3,2%)	4(3,7%)	9(3,4%)
	Fair	17(10,8%)	12(11,0%)	29(10,9%)
	Good	93(59,2%)	50(45,9%)	143(53,8%)
	Very good	15(9,6%)	15(13,8%)	30(11,3%)
	Excellent	27(17,2%)	28(25,7%)	55(20,7%)
Social activities and relationships Mental health				
	Poor	3(1,9%)	2(2,0%)	5(1,9%)
	Fair	14(8,9%)	13(13,1%)	27(10,5%)
	Good	101(63,9%)	45(45,5%)	146(56,8%)
	Very good	15(9,5%)	16(16,2%)	31(12,1%)
	Excellent	25(15,8%)	23(23,2%)	48(18,7%)
Social activities and roles				
	Poor	3(2,0%)	4(4,1%)	7(2,8%)
	Fair	16(10,6%)	10(10,3%)	26(10,5%)
	Good	89(58,9%)	44(45,4%)	133(53,6%)
	Very good	16(10,6%)	16(16,5%)	32(12,9%)
	Excellent	27(17,9%)	23(23,7%)	50(20,2%)
Physical activities				
	Poor	3(2,0%)	4(4,1%)	7(2,8%)
	Fair	16(10,6%)	10(10,3%)	26(10,5%)
	Good	89(58,9%)	44(45,4%)	133(53,6%)
	Very good	16(10,6%)	16(16,5%)	32(12,9%)
	Excellent	27(17,9%)	23(23,7%)	50(20,2%)
Feeling anxious, depressed, or irritable				
	Always	7(4,5%)	2(2,2%)	9(3,6%)

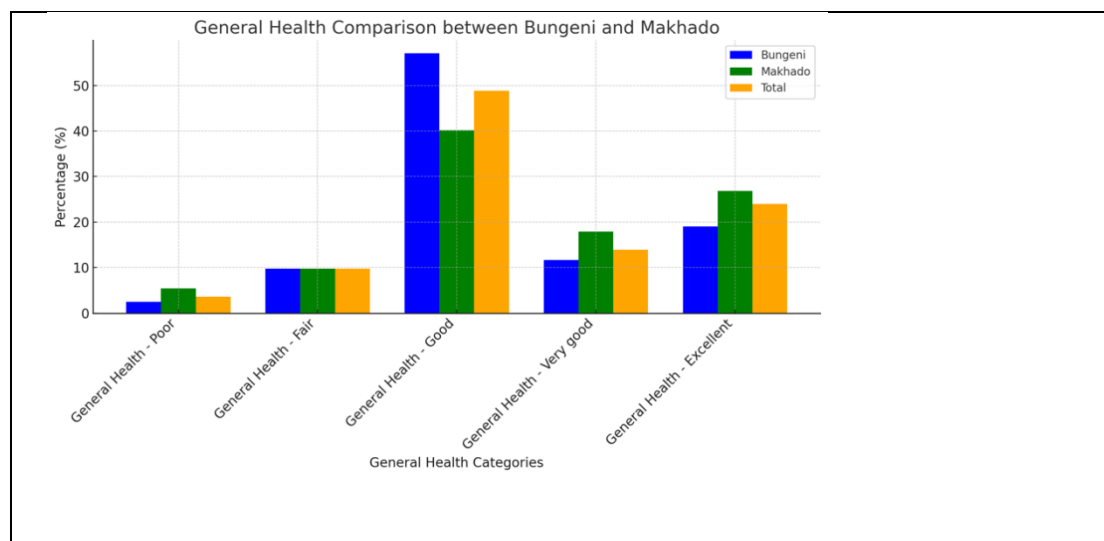
Often	4(2,6%)	7(7,6%)	11(4,4%)
Sometimes	43(27,6%)	20(21,7%)	63(25,4%)
Rarely	16(10,3%)	17(18,5%)	33(13,3%)
Never	86(55,1%)	46(50,0%)	132(53,2%)

Fatigue	Very severe	3(2,0%)	0(0,0%)	3(1,3%)
	Severe	4(2,7%)	1(1,2%)	5(2,1%)
	Moderate	43(29,3%)	17(19,8%)	60(25,8%)
	Mild	12(8,2%)	17(19,8%)	29(12,4%)
	None	85(57,8%)	51(59,3%)	136(58,4%)

How would you rate your pain on average? - 0 is no pain and 10 is worst pain ima

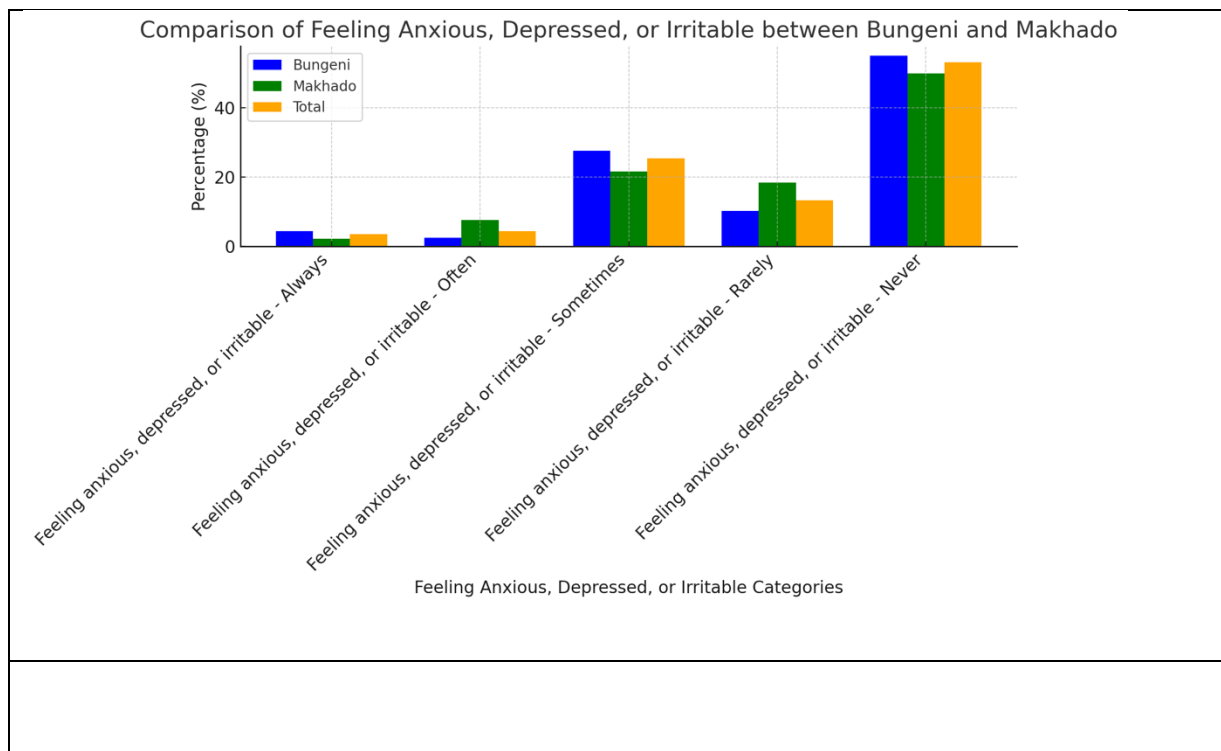
0	7(15,9%)	10(28,6%)	17(21,5%)
1	18(40,9%)	5(14,3%)	23(29,1%)
2	12(8,2%)	17(19,8%)	29(12,4%)
3	1(2,3%)	4(11,4%)	5(6,3%)
4	3(6,8%)	4(11,4%)	7(8,9%)
5	2(4,5%)	2(5,7%)	4(5,1%)
6	2(4,5%)	1(2,9%)	3(3,8%)
7	1(2,3%)	0(0,0%)	1(1,3%)
8	2(4,5%)	2(5,7%)	4(5,1%)
9	1(2,3%)	0(0,0%)	1(1,3%)
10	3(6,8%)	0(0,0%)	3(3,8%)

Figure 1: General health outcomes



In Bungeni, 2.5% of respondents reported their general health as poor, while in Makhado, this percentage is higher at 5.4%. Overall, 3.6% of respondents across both locations rated their health as poor. Fair: Both Bungeni and Makhado had the same percentage (9.8%) of respondents reporting their health as fair. Therefore, the total percentage also reflects 9.8%. This analysis indicates that Makhado generally reports higher levels of health satisfaction, particularly in the "Very Good" and "Excellent" categories, while Bungeni has a higher percentage of respondents in the "Good" category.

Figure 2: Comparison of feelings of anxiety, depression and irritability



Here is the bar chart comparing Feeling Anxious, Depressed, or Irritable between Bungeni, Makhado, and the total population across different categories. 4.5% of respondents in Bungeni reported always feeling anxious, depressed, or irritable, while only 2.2% in Makhado gave the same response. The overall percentage is 3.6%. In Bungeni, 2.6% of respondents reported often feeling anxious, depressed, or irritable, while this percentage is higher in Makhado at 7.6%. The total percentage is 4.4%. A larger portion of respondents in Bungeni (27.6%) reported sometimes feeling anxious, depressed, or irritable, while in Makhado, this percentage is lower at 21.7%. The total percentage is 25.4%. 10.3% of respondents in Bungeni reported rarely feeling anxious, depressed, or irritable, compared to 18.5% in Makhado. The overall percentage is 13.3%. The majority of respondents in both Bungeni (55.1%) and Makhado (50.0%) reported never feeling anxious, depressed, or irritable. The overall percentage is 53.2%.

This analysis suggests that respondents in Bungeni tend to report higher occurrences of feeling anxious, depressed, or irritable "sometimes" or "always," while Makhado has higher responses in the "often" and "rarely" categories. Both locations show a strong majority who report never feeling anxious, depressed, or irritable. 32.4% account to respondents who admitted to feeling anxious, depressed and irritable differing in accuracy.

Coping Mechanisms

Coping strategies, as reported in the COPE section, the most common coping strategy reported is taking breaks from watching, reading, or listening to news stories, including social media, by 64.2% of participants, showing a preference for media disengagement to manage stress. A concerning 2.8% used alcohol and drugs to cope. Stress during an outbreak can lead to maladaptive coping mechanisms, which may include increased alcohol intake. Alcohol consumption reduces immune system strength and can weaken a PLWH's ability to fight HIV and COVID-19. Alcohol may lead to impaired judgment, such as engaging in risky sexual behaviors. Although participants were practicing physical distancing, those who were quarantined with a romantic partner may have engaged in sexual activities more often, which may be problematic for PLWH whose viral load is not well managed and who do not engage in protective behaviors.

Objective 2: To determine strategies used to cope with COVID-19 among HIV patients.

Table 4: Coping with COVID-19 All of Us Study COVID-19 Participant Experience (COPE)

	N	%
Taking breaks from watching, reading, or listening to news stories, including social media	183	64,2%
Engaging in healthy behaviours like trying to eat healthy, well-balanced meals, exercising regularly	67	23,5%
Making time to relax	58	20,4%
Taking care of your body, such as taking deep breaths, stretching, or meditating	32	11,2%
Connecting with others, including talking with people you trust about your concerns and how you are feeling	40	14,0%
Increasing watching, reading, or listening to news stories, including social media	17	6,0%
Eating more food than usual	10	3,5%
Eating high-fat or sugary foods	8	2,8%
Drinking alcohol	4	1,4%
Contacting a healthcare provider	4	1,4%
Delaying medical care for conditions other than COVID-19	2	0,7%
Eating less food than usual	2	0,7%
Using cannabis or marijuana, smoking more, or vaping more	4	1,4%
Over-exercising	7	2,5%

The findings highlight that most the majority use healthy coping mechanism by engaging in healthy behaviours like exercising, eating healthy and taking time to relax.

Objective 3: To assess the association between gender and the impact that COVID-19 has on PLWH.

Table 5: Association between gender and impact of COVID-19 on patients receiving ART

Variables				
	Gender	N	Mean	Std Deviation
Feeling anxious, depressed and irritable	Female	170	11,1869	8.6411
	Male	115	10.7813	8.0366

Independent T-Test				
Variables	df	t	p-value	
Feeling anxious, depressed And irritable	285	0,527	,599	

Note: Association – *indicates significance at 0.05 level

Hypothesis: Females will report more levels of anxiety, irritability and depression than males. The t-test result showed that there is no association between gender and the levels of anxiety, irritability and depression, gender – females (M = 11.1869, SD = 8.6411) were not significantly different in level of irritability, anxiety and depression $t(285) = 0,527$, $P < .599$ compared males (M = 10.7813, SD = 8.0366). The result implies that gender has no significant influence on anxiety, irritability and depression. Hypothesis three was rejected.

Discussion

The study aimed to assess the impact of COVID-19 on PLWH who are on ART and to determine strategies used to cope with challenges as a results of COVID-19 among HIV patients. Table 2 illustrates concerns and fear of COVID-19 results from the survey. The results indicate that a total of 13% respondents from both areas sampled agreed that they were not fearful of COVID-19. A total of (38. 5%) of the respondents which is (32. 9%) from Bungeni and (47, 2%) from Makhado were neutral about their fears. A total of (48.5%) respondents from both areas indicated that they are fearful of COVID-19. (15. 1%) disagreed with the notion that it makes them to have a discomfort to think about COVID-19. (43. 3%) from both sampled areas indicated to being neutral about being uncomfortable and anxious when thinking about COVID-19 and a total of (41. 6%) agreed that they feel anxious and uncomfortable when they think about COVID-19. As illustrated in table 2 respondents (34.3%) indicated that their hands become clammy when they think about COVID-19, while (15.5%) reported the opposite. Furthermore as illustrated in table 2 (47.1%) indicated that they are afraid of losing their lives as a result of COVID-19, (13.5%) reported they aren't fearful of losing their lives to COVID-19 and (39.5%) reported to feeling neutral, this is consistent with (Jardim, Zamani, & Akrami, 2022 & Orr et al., 2023). Similarly, various studies maintaine that fear of COVID-19 was prevalent, fear of death was not only for patients but also Health Care Professionals (Orr et al, 2023)

It's also revealed that media such as social media perpetuated the anxiety and that resulted in people feeling nervous all the time as reported by (40.1%), while the media did not impact much on (12.9%) participant's mental health status. Joska et al, 2020

found similar findings, during COVID pandemic anxiety led some to having troubles with sleep (35.2%), while (17.6%) reported to having no sleeping troubles during the pandemic and (47.3%) reported feeling neutral. Table 2 also illustrate physiological patterns such as heart palpitations to (35.8%) of the sampled population, while (18%) reported negative to the physical symptoms and (46.2%) reported to not being certain. Similarly, SeyedAlinagh et al (2023) found that PLWH suffered from psychological disorders and some increased substance abuse. The current findings concurs to Campbell et al. (2022).

It can't be disputed that the COVID-19 has led to an unexpected interruption of peoples' lives and health care across the globe. The negative impact of this on patients was not limited to physical, but extended onto their mental and social wellness. Disorders related to anxiety and depression have been on the rise since the onset of the pandemic as indicated by Kaye et al. (2021). General health perception as illustrated in table 3 indicates a relatively positive health perceptions despite the pandemic with a (74.2%) positive response rate from both areas sampled with only (3.6%) reported negatively and (9.8%) reported fairly. A (87.3%) reported excellent physical health, with only (2.7%) reported poor physical health amidst COVID-19 and (10.0%) reported experiencing just fair physical health. While the researcher notes that physical activity was limited and restricted in certain areas the study reports that (87.4%) participants were still able to continue with their physical activities while (2.8%) reported a decline in their physical activities and (9.8%) indicating that it was fairly. Mental health report had a significantly positive response with (85.8%) reporting positive mental health experience during the pandemic with (3.5%) reporting to experiencing negative mental health symptoms and (10.9%) being neutral. (8%) reported to always feeling anxious

and experiencing depression, while (25%) reported to occasionally experiencing anxiety and depression and (66.5%) reported they never experienced depression and anxiety amidst the pandemic. It can't be denied that Covid19 pandemic is no different. The COVID- 19 global health crisis caused unprecedented stress and overburden on health care systems and professionals. Besides, to manage the essential cases became also a problem for physicians (Ozkendir et al., 2020). Social distance rules and patient anxiety related to COVID-19 led to the suspension of nearly all out-patient appointments and a transition to virtual telemedicine appointments. This implied that patients with serious illnesses such as cancer, diabetes, and cardiovascular diseases and HIV were more likely to experience lack of services and medicines that they required (Joska, 2020 & Kaye et al., 2021).

A (3.4%) of the sampled population reported to experiencing extreme fatigue during the pandemic, with (38.3%) reported moderate feelings of fatigue and (58.4%) reported to experiencing no fatigue during COVID-19). Another affected aspect of life during the pandemic were social activities and relationships. The study reveal (12.4%) of the population had their social lives affected while (86. 7%) reported that their social lives remained the same even in the midst of the pandemic (Akrami, 2022).

The population also indicated that (64.2%) of the responded would refrain from the media and social media as a mechanism to cope during the pandemic. This was most likely done to reduce anxiety caused by exaggerated news from the media. A (46.4%) indicated that exercising regularly and a well-balanced life worked from them to cope better. A (14.0%) indicated casual talks to have been therapeutic and helped cope.

Furthermore, population report to not have had experienced social isolation from people, activities and their surrounding while (1.4%) reported to have experienced

social isolation. Consistent to previous findings, PLWH's coping with COVID-19 may have a big impact on biological, psychological, and social lives as postulated by Chenneville (2020). The current study found that there was no significant difference between gender and the impact of COVID-19. On the contrary, there is an interplay between gender, food insecurity and ART adherence (Gumede 2021 & Gumede 2023).

Conclusion

The COVID-19 lockdown had a significant adverse impact on people's participation in HIV care in South African primary care clinics, through HIV testing and treatment initiation. This study sought to determine the level of concern about COVID-19, general health through the PROMIS 10 scale and coping strategies. In addition, assessment of significant difference between gender and the impact of COVID-19. The findings highlight that the general health of respondents is high with 65.4%, and quality of life respectively. A concerning 47.1% reported anxiety and 35.2% struggling to sleep which compromises health. There was no significant difference between gender and feeling anxious, depressed and irritable with gender. The health system implementors in SA need to classify psychological treatment as essential to be as swiftly as general health response to improve the health and wellbeing for PLWH during COVID-19.

Acknowledgements

We acknowledge the participants who did not hesitate to be part of the study. We would also like to acknowledge the Limpopo Department of Health for granting approval for the study and nursing staff members at Makhado and Bungeni health centres for their support.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

ORCID

Ramasela Moyo <https://orcid.org/009-0005-6366-612X>

Angelina Maphula <http://orcid.org/0000-0001-8208-6618>

Lufuno Makhado <http://orcid.org/0000-0003-1689-9308>

References

Al Dhaheri, A. S., Bataineh, M. A. F., Mohamad, M. N., Ajab, A., Al Marzouqi, A., Jarrar, A. H., ... & Cheikh Ismail, L. (2021). Impact of COVID-19 on mental health and quality of life: Is there any effect? A cross-sectional study of the MENA region. *PloS one*, 16(3), e0249107. <https://doi.org/10.1371/journal.pone.0249107>

Ahorsu, D.K., Lin, C.Y., Imani, V. et al. The Fear of COVID-19 Scale: Development and Initial Validation. *Int J Ment Health Addiction* 20, 1537–1545 (2022). <https://doi.org/10.1007/s11469-020-00270-8>

Amuche, N. J., Emmanuel, E. I., & Innocent, N. E. (2017). *HIV/AIDS in sub-Saharan Africa: current status, challenges and prospects*. : <https://www.ir.must.ac.ug>

Binagwaho, A., & Mathewos, K. (2020). What explains Africa's successful response to the COVID-19 pandemic. *Medical News Today*, 20 August 15

Cella, D., Riley, W., Stone, A., Rothrock, N., Reeve, B., Yount, S& Hays R. (2010). The Patient-Reported Outcomes Measurement Information System (PROMIS) developed and tested its first wave of adult self-reported health outcome item banks: 2005–2008. *Journal of Clinical Epidemiology*, 63(11), 1179-1194.
<https://doi.org/10.1016/j.jclinepi.2010.04.011>

Cheng, P., Nicholas, J., Wanhong, Z., Aradhita, Y., Lirong, W.,.....& Li W. (2021). Psychometric Properties of the Primary Care PTSD Screen for DSM-5: Findings From Family Members of Chinese Healthcare Workers During the Outbreak of COVID-19. *Front. Psychiatry*, (12)2021 | <https://doi.org/10.3389/fpsy.2021.695678>

Chenneville, T., Gabbidon, K., Hanson, P., & Holyfield, C. (2020). The impact of COVID-19 on HIV treatment and research: a call to action. *International journal of environmental research and public health*, 17(12), 4548.
<https://doi.org/10.3390/ijerph17124548>

Creswell, J. W. (2014). *A concise introduction to mixed methods research*. SAGE publications.

De Vos, A. S., Strydom, H. F., & Fouche, C. CB & Delport, CSL 2011. *Research at grass roots*.

Dorward, J., Khubone, T., Gate, K., Ngobese, H., Sookrajh, Y., Mkhize, S., ... & Garrett, N. (2021). The impact of the COVID-19 lockdown on HIV care in 65 South African primary care clinics: an interrupted time series analysis. *The Lancet HIV*, 8(3), e158-e165. [https://doi.org/10.1016/S2352-3018\(20\)30359-3](https://doi.org/10.1016/S2352-3018(20)30359-3)

Esteves, C. S., Oliveira, C. R., De-Argimon, I.I .L. (2021). Social Distancing: Prevalence of Depressive, Anxiety, and Stress Symptoms among Brazilian Students during the COVID19 Pandemic. *Front Public Health*; 8:589966. doi:10.3389/fpubh.2020.589966

Higgins-Biddle, J. C., & Babor, T. F. (2018). A review of the Alcohol Use Disorders Identification Test (AUDIT), AUDIT-C, and USAUDIT for screening in the United States: Past issues and future directions. *The American Journal of Drug and Alcohol Abuse*, 44(6), 578–586. <https://doi.org/10.1080/00952990.2018.1456545>

Hogan, A. B., Jewell, B. L., Sherrard-Smith, E., Vesga, J. F., Watson, O. J., Whittaker, C., ... & Hallett, T. B. (2020). Potential impact of the COVID-19 pandemic on HIV, tuberculosis, and malaria in low-income and middle-income countries: a modelling study. *The Lancet global health*, 8(9), e1132-e1141. DOI:[https://doi.org/10.1016/S2214-109X\(20\)30288-6](https://doi.org/10.1016/S2214-109X(20)30288-6)

International AIDS Society. COVID-19 and HIV. A tale of two pandemics. COVID-19 and HIV. [https:// www.iasociety.org](https://www.iasociety.org)

Joska, J. A., Andersen, L., Rabie, S., Marais, A., Ndwandwa, E. S., Wilson, P., & Sikkema, K. J. (2020). COVID-19: increased risk to the mental health and safety of women living with HIV in South Africa. *AIDS and Behavior*, 24(10); 2751-2753. DOI:<https://doi.org/10.1007/s10461-020-02897-z>

Kaye, A. D., Okeagu, C. N., Pham, A. D., Silva, R. A., Hurley, J. J., Arron, B. L., ... & Cornett, E. M. (2021). Economic impact of COVID-19 pandemic on healthcare facilities and systems: International perspectives. *Best Practice & Research Clinical Anaesthesiology*, 35(3), 293-306. <https://doi.org/10.1016/j.bpa.2020.11.009>

Makhado municipality. (2021). *IDP plan*. <http://www.makhado.gov.za>

Mcinziba, A., Bock, P., Hoddinott, G., Seeley, J., Bond, V., Fidler, S., & Viljoen, L. (2023). Managing household income and antiretroviral therapy adherence among people living with HIV in a low-income setting: a qualitative data from the HPTN 071 (PopART) trial in South Africa. *AIDS Research and Therapy*, 20(1), 54. <https://doi.org/10.1186/s12981-023-00549-5>.

Muzyamba, C., Makova, O., & Mushibi, G. S. (2021). Exploring health workers' experiences

of mental health challenges during care of patients with COVID-19 in Uganda: a qualitative study. *BMC research notes*, 14, 1-5. <https://doi.org/10.1186/s13104-021->

[05707-4](#)

National Institute of Health. 2020. All of Us Research Programme.
<https://allofus.nih.gov>

Olufadewa, I., Oduguwa, I., Adesina, M., Ibiang, K., Eke, N., Adewumi, B., ... & Adeyelu, N. (2021). COVID-19: Learning from the HIV/AIDS pandemic response in Africa. *The International Journal of Health Planning and Management*, 36(3), 610-617. <https://doi.org/10.1002/hpm.3133>

Orr, N. M., Hajjiyannis, H., & Motuba, T. (2023). COVID-19 impact on newly initiated and restarted antiretroviral treatment patients in the Eastern Cape, South Africa. *African Journal of Primary Health Care & Family Medicine*, 15(1), 3811. https://doi.org/10.https://hdl.handle.net/10520/ejc-phcfm_v15_n1_a3811.

Ozkendir, O. M., Askar, M., & Kocer, N. E. (2020). Influence of the epidemic COVID-19: an outlook on health, business and scientific studies. *Lab-in-Silico*, 1(1), 26-30. DOI: 10.22034/lins20011026

Pillay-van Wyk, V., Msemburi, W., Dorrington, R. E., Laubscher, R., Groenewald, P., & Bradshaw, D. (2019). HIV/AIDS mortality trends pre and post ART for 1997-2012 in South Africa—have we turned the tide?. *South African Medical Journal*, 109 (11b), 41-44. DOI:10.7196/SAMJ.2019.v109i11b.14283

Prabhu, S., Poongulali, S., & Kumarasamy, N. (2020). Impact of COVID-19 on people living with HIV: a review. *Journal of virus eradication*, 6(4), 100019. <https://doi.org/10.1016/j.jve.2020.100019>

SeyedAlinaghi, S., Mirzapour, P., Pashaei, Z., Afzalian, A., Tantuoyir, M. M., Salmani, R., ... & Dadras, O. (2023). The impacts of COVID-19 pandemic on service delivery and treatment outcomes in people living with HIV: a systematic review. *AIDS Research and Therapy*, 20(1), 4. <https://doi.org/10.1186/s12981-022-00496-7>.

Shi, L., Tang, W., Hu, H., Qiu, T., Marley, G., Liu, X., ... & Fu, G. (2021). The impact of COVID-19 pandemic on HIV care continuum in Jiangsu, China. *BMC infectious diseases*, 21(1), 1-9. <https://doi.org/10.1186/s12879-021-06490-0>

Slaughter, F. A. (2021). *The Impact of COVID-19 Stress on ART Adherence and Unsuppressed Viral Loads in People Living with HIV in Western Washington*. Published Thesis. University of Washington, Public health.

Statistics South Africa (Stats SA). (2021). *Mid-Year Population Estimates*. Pretoria, South Africa, Stats SA. <http://www.stassa.gov.za>

Sun, S., Hou, J., Chen, Y., Lu, Y., Brown, L., & Operario, D. (2020). Challenges to HIV care and psychological health during the COVID-19 pandemic among people living with HIV in China. *Journal of AIDS and Behavior*, 24(10), 2764-2765. <https://doi.org/10.1007/s10461-020-02903-4>

Tikkanen, R. A. G. N. W., & Reginald, D. (2020). *How the US Compares to Other Countries in Responding to COVID-19: Populations at Risk, Health System Capacity, and Affordability of Care*. <http://www.pesquisa.bvsalud.org>. ID: grc-740785

Waterfield, K.C., Shah, H.G., Etheredge3, G.D., & Ikhile, O. (2021). Consequences of COVID-19 crisis for persons with HIV: the impact of social determinants of health: Commentary; *BMC Public Health*, (21) 229, 2-7. <https://doi.org/10.1186/s12889-021-10296-9>

World Health Organization. (2020). COVID-19 Global risk *Communication and Community Engagement Strategy*. <http://www.apps.who.int>

SECTION 3: CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS

3.1 INTRODUCTION

This section will outline the conclusion of the manuscript. After that, the limitations will be indicated together with the recommendations. And then, the concluding remarks will be given based on the assessment of the whole study. Discussion will reflect upon the the significance of the study and focus on the objectives.

3.2 CONCLUSIONS

3.2.1 CONCLUSIONS OF THE MANUSCRIPTS

Phase 1

Objective 1:

Manuscript 1

The review sought to explore the impact of COVID-19 on PLWH whi are receipients of ART in South Africa. The findings from the systematic review revealed two themes, namely: the impact of COVID-19 on ART adherence highlighting disruption of care; and experiences of patientce during COVID-19 highliting psychological and spcial impact. In summary the lockdown impact is unequal, dependent on a complex web of individual, social and structural factors; household level factors in ART adherence also influenced impact; various studies found that ART provision was mostly maintained during the 2020 COVID-19 lockdown bit HIV testing and ART initiations were largely impacted where Intra and interpersonal level factors and comorbidities influence ART adherence; Community level factors affect ART adherence; Risk of virological failure was higher among responderents with moderate to severe depressive symptoms; Depression and other mental health problems remain underdiagnosed and untreated among rural PLHIV; Financial constrain remain a barrier to ART adherence; there is an intereplay between gender, food insecurity and ART adherence; Combined effects resulted in delayed access to HIV care, missing clinic appointments and poor medication adherence; lack of auxiliary services such as social workers, treatment support groups and psychotherapy; overall number of patients who restarted ART increased in response to fears of co-infection with Coronavirus. During COVID-19 many provinces in SA recorded changes in the course of ART treatment; Other challenges were psychological disorders such as anxiety and depression, an increase in substance abuse and a rise in experienced stigma and discrimination. Therefore various challenges were revealed linked with disruptions of care, psychological and social impact of COVID-19.

Therefore, these psychosocial deficits may lead to lower ART adherence; which may lead to suppressed viral levels that will give rise to diseases and mortality in PLWH. Secondly, the study revealed that COVID-19 has adversely affected HIV health-care system in many countries. In- person clinical consultations, follow up and community treatment support services were hampered severely by the pandemic and that led to a brief rise in missed ART collection visits during first months of COVID-19, however, collections resumed quickly as their lockdown levels were eased.

Phase 2

Manuscript 2

Objective 1, 2 and 3

The study sought to assess the level of general health, concern about COVID-19 and coping strategies.

The findings highlight a substantial 34,4% of respondents being afraid of COVID-19 and 14,1% also agreeing, implying the almost half of the respondents experiences anxiety. 47.1% reported being afraid to die COVID-19 and 35.2% struggling to sleep due to worrying about COVID-19. Although the PROMIS 10 scale reflect 64.4% and quality of life was reported to be high, the COPE scale highlight 2,8% used alcohol and drugs to cope, 3,5% used binge eating to cope. The majority reported more positive adaptive ways to cope such as eating healthy, taking break from social media, exercising and connecting with other people. Hypothesis: Females will report more levels of anxiety, irritability and depression than males. The t-test result showed that there is no association between gender and the levels of anxiety, irritability and depression, gender – females ($M = 11.1869$, $SD = 8.6411$) were not significantly different in level of irritability, anxiety and depression $t(285) = 0.527$, $P < .599$ compared males ($M = 10.7813$, $SD = 8.0366$). The result implies that gender has no significant influence on anxiety, irritability and depression. Hypothesis three was rejected. The health system implementors in SA need to classify psychological treatment as essential to be as swiftly as general health response to improve the health and wellbeing for PLWH during COVID-19.

3.3 LIMITATIONS

The study is subject to social desirability bias as HIV patients on ART had to do self-report on the survey provided. Given the stigma and judgemental attitudes towards PLWH and lack of disclosure about this in SA, some respondents, especially with the issues relating to COVID-19 which was also stigmatised to an extent, are more likely to respond in a favourable manner. The fact that there are no golden standards to measure the above mentioned variables to

determine the impact COVID-19 had on PLWH, further research and analysis should be undertaken using other measures to assess these findings.

3.4 RECOMMENDATIONS

Given the disruption of HIV/AIDS services during the Corona virus pandemic, in the future health system planners should maintain the treatment process by prioritizing access to ART for PLWH and HIV testing services; and HIV treatment guidelines should clearly emphasise the importance of easy access to ART. To address the mental health needs of PLWH, the health system policies need to classify psychological treatment as essential to be as rapid as general health response because psychological treatment of anxiety, depression, alcohol and substance abuse for PLWH during COVID-19 is key to ensure 90/90/90 strategy. A culturally acceptable and feasible psychological intervention should be developed for implementation as a crucial part of HIV care. The use of mobile technology and social media could be implemented on a larger scale to support HIV care and adherence, psychological and social needs for PLWH.

3.5 CONCLUDING REMARKS

The study aimed to investigate the impact of COVID-19 on HIV patients who are on ART in Vhembe district in Limpopo Province. The findings highlight that COVID-19 impacted systems in place especially ART programme, in addition PLWH experienced anxiety and depression during COVID-19. Although respondents reported high quality of life, psychological effects were reported. This study provides a unique insight into the impact of the COVID-19 lockdown on ART patients. Tailor-made programmes designed to address and improve the wellbeing of PLWH was indicated.

ANNEXURE A: ETHICAL CLEARANCE

RESEARCH ETHICS APPROVAL CERTIFICATE

RESEARCH AND INNOVATION
OFFICE OF THE DIRECTOR

NAME OF RESEARCHER/INVESTIGATOR:
Prof L Makhado

STAFF NO:
13663

PROJECT TITLE: The Impact of the COVID-19 Pandemic on People with HIV.

PROJECT NO: FHS/21/PH/24/2411

SUPERVISORS/ CO-RESEARCHERS/ CO-INVESTIGATORS

NAME	INSTITUTION & DEPARTMENT	ROLE
Prof L Makhado	University of Venda (Department of Public Health)	Principal Investigator
Prof MT Mulaudzi	University of Venda	Co- Principal Investigator
Dr A Maphula	University of Venda (Department of Psychology)	Co- investigator
Ms OP Masekwa	University of Venda (Department of Psychology)	Co- investigator
Prof SM Maputle	University of Venda (Department of Advanced Nursing)	Co- investigator
Ms TG Makhado	University of Venda (Department of Advanced Nursing)	Co- investigator
Ms RA Moyo	University of Venda (Department of Psychology)	Co- investigator
Ms N Rammela	University of Venda (Department of Public Health)	Co- investigator

Type: Staff Research

Risk: Minimal risk to humans, animals or environment (Category 2)

Approval Period: November 2021 – November 2023

The Human and Clinical Trials Research Ethics Committee hereby approves your project as indicated above.

General Conditions

While this ethics approval is subject to all declarations, undertakings and agreements incorporated and signed in the application form, please note the following:

- The project leader (principal investigator) must report to the prescribed format to the REC:
 - Annually (or as otherwise requested) on the progress of the project, and upon completion of the project.
 - Within 48 hours in case of any adverse event (or any matter that interrupts sound ethical principles) during the course of the project.
- Annually a number of projects may be randomly selected for an external audit.
- The approval applies strictly to the protocol as stipulated in the application form. Should any changes to the protocol be deemed necessary during the course of the project, the project leader must apply for approval of those changes at the REC. Should there be deviation from the project protocol without the necessary approval of such changes, the ethics approval is hereby void and automatically initiated.
- The date of approval indicates the first date that the project may be started. Would the project have to continue after the expiry date, a new application must be made to the REC and new approval received before or on the expiry date.
- In the interest of ethical responsibility, the REC retains the right to:
 - Revoke access to any information or data at any time during the course or after completion of the project.
 - To ask further questions; Seek additional information; Require further modification or monitor the conduct of your research or the informed consent process.
 - Suspend or postpone approval if:
 - Any unethical principles or practices of the project are revealed or suspected.
 - It becomes apparent that any relevant information was withheld from the REC or that information has been false, false or misrepresented.
 - The required annual report and reporting of adverse events was not done timely and accurately.
 - Any institutional rules, national legislation or international conventions demand it necessary.

ISSUED BY:

UNIVERSITY OF VENDA, RESEARCH ETHICS COMMITTEE

Date Considered: September 2021

Name of the Chairperson of the Committee: Dr NS Mashau

Signature:




ANNEXURE B: DEPARTMENT OF HEALTH APPROVAL LETTER LIMPOPO PROVINCE



LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF
HEALTH

Ref : LP_2022-12-002
Enquires : Ms PF Mahlokwane
Tel : 015-293 6028
Email : Phoebe.Mahlokwane@dhsd.limpopo.gov.za

Makhado Lufuno et al

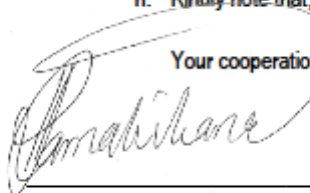
PERMISSION TO CONDUCT RESEARCH IN DEPARTMENTAL FACILITIES

Your Study Topic as indicated below;

**STUDY VIII: THE IMPACT OF THE COVID-19 PANDEMIC ON PEOPLE WITH HIV IN
A SELECTED FACILITIES OF MAKHADO MUNICIPALITY OF VHEMBE DISTRICT,
LIMPOPO PROVINCE IN SOUTH AFRICA**

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 BUNGENI CHC and MAKHADO CHC
 - 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

12/12/2022

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>

The heartland of Southern Africa – Development is about people!

ANNEXURE C1: INFORMATION SHEET

Title of the Research Study : The impact of COVID-19 on HIV patients who are on ART in Vhembe district Limpopo Province, South Africa.

Principal Investigator/s/ researcher : Ramasela Anna Moyo, Bachelor of Arts in Psychology

Co-Investigator/s/supervisor/s : Prof Angelina Maphula

Co-Supervisor : Prof Lufuno Makhado

Brief Introduction and Purpose of the Study: HIV and Aids is one of the biggest health concerns in South Africa. According to Statssa (2021), an estimated number of PLWH in SA has increased from 3.8 million in 2002 to an estimated 8.2 million by 2021, with more than 200 000 new infections and 72000 AIDS related deaths. Furthermore, SA has the largest number of people enrolled for ART in the world. UNAIDS (2019) indicated that Limpopo Province had 515 091 of PLWH, with a prevalence of 8.99%. The NICD (2022) has reported that an estimated 3.5 million people in SA were infected with COVID-19, with 93 949 COVID-related deaths in the beginning of 2022. Limpopo province accounted for 147 195 of those total cases. The COVID-19 pandemic might have to an extend interrupted HIV prevention and treatment programmes in SA and Limpopo Province, including Makhado municipality in Vhembe district as it did globally. Thus the purpose of this study is to investigate the impact of COVID-19 on HIV patients who are on ART.

Outline of the Procedures : One of the conditions expected from you if you decide to participate in this research study is that you will be requested to sign a consent form as a way to agree to participate. _____ PLWH from the Makhado municipality, accessing health services at Makhado and Bungeni health centres will participate in this study. You will be able to participate in this study if you are an adult of 18 years and above living with HIV; you have been registered _____ on ART and have resided in the mentioned municipality for at least two years. This study will take place at the selected Makhado and Bungeni health centres in Makhado municipality. A survey questionnaire will be used to collect data from the participants. The questionnaire will be presented in Tshivenda, Xitsonga or English language. Data will be collected for 30 days from patients who came for ART monthly check-up.

Risks or Discomforts to the Participant: This survey study may cause you to have feelings of anxiety, anger or memories of the violence you or someone else has faced.

Benefits: There will be no direct benefit to you for participation in this study but the information from the study may help in improving the adherence to ART on participants and to protect themselves from COVID-19.

Reason/s why the Participant May Be Withdrawn from the Study: People participating in this study will be allowed to withdraw from participation whenever they wish to. Moreover, those who will become ill during participation and those who will fail to comply with the set rules of participation will be withdrawn from participation. Withdrawal from participation for any reason will not lead to adverse consequences.

Remuneration: Research participants will by no means receive monetary or other types of remuneration.

Costs of the Study: Respondents in this study will not be expected to cover any costs towards the study. The researcher will be responsible for every cost of the survey.

Confidentiality: The researcher will make every effort to treat respondents' information with confidentiality. To ensure confidentiality, responses will be made anonymous through requesting respondents to not write any identifying information on their response sheets and code names will be assigned to respondents to refrain from using real respondents' names on the response sheets. Following data collection, the completed survey questionnaires will be retained in a safe place. Respondents' data will only be disclosed in circumstances of legal obligation such as but not limited to known incidents of abuse and suicide risk.

Research-related Injury:

Psychological services will be made available for the research participants in guard of negative affective reactions that may occur as a result of participation, such as anxiety, anger and traumatic memories.

Persons to Contact in the Event of Any Problems or Queries:

Please contact the researcher on 076 420 9330, my supervisor, Dr. A. Maphula on 015 962 8341 or the University Research Ethics Committee Secretariat on 015 962 9058. Complaints can be reported to the Director: Research and Innovation, Prof GE Ekosse on 015 962 8313 or Georges.Ivo.Ekosse@univen.ac.za

General:

Potential participants must be assured that participation is voluntary and the approximate number of participants to be included should be disclosed. A copy of the information letter should be issued to participants. The information letter and consent form must be translated and provided in the primary spoken language of the research population

ANNEXURE C2: INFORMED CONSENT

CONSENT

Statement of Agreement to Participate in the Research Study:

- I hereby confirm that I have been informed by the researcher, (Ramasela Anna Moyo), about the nature, conduct, benefits and risks of this study - Research Ethics Clearance Number: __,
- I have also received, read and understood the above written information (*Participant Letter of Information*) regarding the study.
- I am aware that the results of the study, including personal details regarding my sex, age, date of birth, initials and diagnosis will be anonymously processed into a study report.
- In view of the requirements of research, I agree that the data collected during this study can be processed in a computerized system by the researcher.
- I may, at any stage, without prejudice, withdraw my consent and participation in the study.
- I have had sufficient opportunity to ask questions and (of my own free will) declare myself prepared to participate in the study.
- I understand that significant new findings developed during the course of this research which may relate to my participation will be made available to me.

Full Name of Participant
Signature

Date

Time

.....
.....

.....

.....

I, (Ramasela Moyo) herewith confirm that the above participant has been fully

Informed about the nature, conduct and risks of the above study.

Full Name of Researcher: Ramasela Anna Moyo Date.....

Signature.....

Full Name of Witness (If applicable)..... Date.....

Signature.....

Full Name of Researcher: Date.....

Signature.....

ANNEXURE D: QUESTIONNAIRE /SURVEY

Study VIII:
The Impact of the COVID-19 Pandemic on
People with HIV

University of Venda Department of Public Health

Please mark your responses directly on this booklet.

If you need help, please see one of the research assistants.

Thank You!

FOR OFFICE USE ONLY

Site:

ID:

Date:

Language:

Prof Carol Dawson-Rose

UCSF School of Nursing

Carol.Dawson-Rose@ucsf.edu

July 2, 2021 version

Prof Lufuno Makhado

University of Venda, Department of Public Health

lufuno.makhado@univen.ac.za

July 2, 2021 version

I. Background Information

1. In what country do you currently live? _____

2. What is your current age? _____ years
3. Do you live in an area that is:
☐ Urban (city)
☐ Suburban (around a city)
☐ Rural
4. Are you of African origin?
☐ Yes
☐ No
5. What sex were you assigned at birth?
☐ Male
☐ Female
6. Ethnicity
7. What is the highest level of education you have completed?
☐ No schooling
☐ Some primary / elementary schooling
☐ Completed primary / elementary school
☐ Some secondary / high school
☐ Completed secondary / high school
☐ Some technical, vocational, or university education / training
☐ Completed technical, vocational, or university education / training
☐ Completed university
☐ Completed Master's Degree or higher
☐ Other: please specify: _____

Concern About COVID-19 [Fear of COVID-19 Scale]

Please respond to each item by clicking one of the 5 responses that reflects how you feel, think, or act toward COVID-19.

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
1. I am afraid of COVID-19					
2. It makes me feel uncomfortable to think about COVID-19					
3. My hands become clammy when I think about COVID-19					
4. I am afraid of losing my life because of COVID-19					
5. When watching news and stories about COVID-19 on social media, I become nervous or anxious					
6. I cannot sleep because I'm worrying about getting COVID-19					
7. My heart races or palpitates when I think about getting COVID-19					

General Health [PROMIS 10]

	Excellent	Very Good	Good	Fair	Poor
1. In general, would you say your health is:					
2. In general, would you say your quality of life is:					
3. In general, how would you rate your physical health?					
4. In general, how would you rate your mental health, including your mood and your ability to think?					
5. In general, how would you rate your satisfaction with your social activities and relationships?					
6. In general, please rate how well you carry out your usual social activities and roles. (This includes activities at home, at work, and in your community, and responsibilities as a parent, child, spouse, employee, friend, etc.)					

7. To what extent are you able to carry out your everyday physical activities such as walking, climbing stairs, carrying groceries, or moving a chair?					
--	--	--	--	--	--

8. In the past 7 days, how often have you been bothered by emotional problems such as feeling anxious, depressed, or irritable?

- ☐ Never
☐ Rarely
☐ Sometimes
☐ Often
☐ Always

9. In the past 7 days, how would you rate your fatigue on average?

- ☐ None
☐ Mild
☐ Moderate
☐ Severe
☐ Very severe

10. How would you rate your pain on average, where 0 is no pain and 10 is the worst pain imaginable?

1-10

Coping with COVID-19 [All of Us Study COVID-19 Participant Experience (COPE)]

In the past month, to cope with social distancing and isolation, are you doing any of the following?

- | | |
|--------------------------|---|
| ☐ | Taking breaks from watching, reading, or listening to news stories, including social media |
| ☐ | Engaging in healthy behaviors like trying to eat healthy, well-balanced meals, exercising regularly, getting plenty of sleep, or avoiding alcohol and drugs |
| ☐ | Making time to relax |
| ☐ | Taking care of your body, such as taking deep breaths, stretching, or meditating |
| ☐ | Connecting with others, including talking with people you trust about your concerns and how you are feeling |
| ☐ | Increasing watching, reading, or listening to news stories, including social media |
| ☐ | Eating more food than usual |
| ☐ | Eating high fat or sugary foods |
| ☐ | Drinking alcohol |
| ☐ | Contacting a healthcare provider |
| ☐ | Delaying medical care for conditions other than COVID-19 |
| ☐ | Eating less food than usual |
| ☐ | None of the above (if selected, no other response options are available) |
| ☐ | Using cannabis or marijuana |
| ☐ | Smoking more cigarettes or vaping more |
| ☐ | Over exercise |
| ☐ | Using prescription drugs (like valium, etc) |
| ☐ | Using non-prescription drugs |
| ☐ | Cutting or self-injury |
| ☐ | Other |

ANNEXURE D: TURNITIN

Turnitin

turnitin.com/t_inbox.asp?lang=en_us&aid=147272768

This is your assignment inbox. To view a paper, select the paper's title. To view a Similarity Report, select the paper's Similarity Report icon in the similarity column. A ghosted icon indicates that the Similarity Report has not yet been generated.

Teachers Perceptions

INBOX | NOW VIEWING: ALL PAPERS ▾

Submit File Online Grading Report | Edit assignment settings | Email non-submitters

☐	AUTHOR	TITLE	SIMILARITY	GRADE	RESPONSE	FILE	PAPER ID	DATE
☐	Anna Ramasela Moyo	The impact of COVID 19	14%		*		2302699371	23-Feb-2024
☐	Gift Mathebula	Teachers perceptions of the impact of po...	24%		*		2282899518	31-Jan-2024
	Murendeni Luhailima	-- no submission --	--				--	Late
	Mathungo Mawelewele	-- no submission --	--				--	Late

Copyright © 1998 – 2024 Turnitin, LLC. All rights reserved. (Privacy Policy)

Helpdesk Research Resources

Feedback Studio - Google Chrome

ev.turnitin.com/app/carta/en_us/?lang=en_us&o=2302699371&u=28007335&s=1

feedback studio Anna Ramasela Moyo The impact of COVID 19 -- /0 < 2 of 2 > ?



University of Venda
Creating Future Leaders

THE IMPACT OF COVID-19 ON HIV PATIENTS WHO ARE ON ART IN VHEMBE DISTRICT,
LIMPOPO PROVINCE, SOUTH AFRICA

BY

Moyo Ramasela Anna
Student Number: 9606520

Match Overview

14%

1	mdpi-res.com	Internet Source	3%
2	link.springer.com	Internet Source	3%
3	ouci.dntb.gov.ua	Internet Source	2%
4	pubmed.ncbi.nlm.nih.g...	Internet Source	1%
5	Submitted to University...	Student Paper	<1%
6	Submitted to University...	Student Paper	<1%
7	discrepancy ut 20 20		<1%

Page: 1 of 108 Word Count: 22812 Text-Only Report High Resolution On

ANNEXURE E: EDITORS LETTER

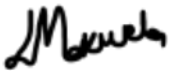
EDITOR'S LETTER

To whom it may concern

This serves to certify that I have been requested by Moyo Ramasela Anna (**STUDENT NUMBER: 9606520**) to proof-read her dissertation for Master of Arts in Psychology. She is a student registered at the University of Venda.

The title of his study is: **THE IMPACT OF COVID-19 ON HIV PATIENTS WHO ARE ON ART IN VHEMBE DISTRICT, LIMPOPO PROVINCE, SOUTH AFRICA.** I have read the whole document and made suggestions reflected through track changes software and highlighting general errors.

Yours Sincerely



J. Mbamaou