



**Living with co-morbidities during the COVID-19 pandemic: a
qualitative study of the heightened physical and psychosocial
challenges emerging from the virus**

BY

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Thesis submitted in compliance with the requirements for the PhD in the Faculty of
Health Sciences at the Durban University of Technology

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DECLARATION BY STUDENT

This is to certify that the work is entirely my own and not of any other person, unless explicitly acknowledged (including citation of published and unpublished sources). The work has not previously been submitted in any form to the Durban University of Technology or to any other institution for assessment or for any other purpose.

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ETHICAL CLEARANCE

This is to certify that the study received ethical approval from the Institutional Research Ethics Committee (IREC) of the Durban University of Technology (DUT) in KwaZulu-Natal.

The ethics clearance number is: **IREC 232/21**

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ABSTRACT

The COVID-19 pandemic created unprecedented challenges for people with co-morbidities. Those with co-morbidities faced mental and physical health consequences, and their family life, social life and healthcare were affected. The presence of co-morbidities was a compounding factor that led to deleterious consequences for this vulnerable group of people. This study sought to explore the various challenges from the experiences and perspectives of people living with co-morbidities during the COVID-19 pandemic in South Africa.

A qualitative research methodology was utilised in this study, with an exploratory-descriptive design, as well as non-probability and snowball sampling. Two samples were recruited namely, those affected by COVID-19 and those infected by COVID-19 post three months. Both samples had one or more co-morbidities. A total of 26 participants eventually participated. The study employed a semi-structured interview schedule to attain the required data, that allowed for a good conversational exploration into participants' experiences during the COVID-19 pandemic. The data was analysed using thematic analysis, which yielded eight themes, all of which had sub-themes.

The key findings from the study were multifactorial, as there were considerable effects on participants' physical health, whereby an intensity of COVID-19 symptoms occurred and long-term COVID symptoms persisted for long periods of time, which resulted in a difficult journey to recovery. The COVID-19 pandemic and the virus had a substantial impact on mental health, as participants endured intense bouts of fear and anxiety with persistent mental trauma post-COVID. Additionally, issues around isolation and concurrent loneliness from lockdown measures took a toll on their health. Empirical evidence shows a worsening of co-morbidities due to declining mental well-being. Family and social lives were vastly affected by the pandemic, causing a multitude of problems relating to finance, bonding, conflicts and bereavement. Obtaining adequate healthcare was difficult during the pandemic, as participants encountered staff shortages, extended wait times, a lack of medication, the sharing and borrowing of medication and a lack of care from medical staff. Participants who were hospitalised faced further challenges that affected their healthcare and overall sense of well-being. Despite the challenges that people with co-morbidities faced, they were hopeful as they began adopting healthier eating habits, exercising and sharing responsibilities

within the home. Having supportive family and friends proved to be a significant benefit. The lockdown also gave people an opportunity to improve familial relationships. Community and religious organisations assisted those in need and people relied on faith and spirituality for a sense of peace and comfort. The data also indicated that many individuals embraced holistic health by incorporating complementary and alternative medicine into their practices. The use of these practices enabled a sense of good physical health among the participants.

This study has provided a new insight into the lives of people with co-morbidities during a period of intense turmoil. The data obtained in this study can be used as a stepping stone to further explore the long-term effects of COVID-19 on people with co-morbidities who are vulnerable to the effects of disasters such as the COVID-19 pandemic, thereby improving their quality of life and health.

DEDICATION

This thesis is dedicated to all those lives who were affected by the COVID-19 pandemic.

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CHAPTER 1: OVERVIEW OF THE STUDY

1.1 Introduction

This chapter aims to provide an overview of the study in relation to the coronavirus disease 2019 (COVID-19) pandemic. The background of the study includes information on the COVID-19 pandemic, namely its emergence, the two previous coronavirus outbreaks, the emergence of COVID-19 in South Africa, COVID-19 and its implications on people with co-morbidities, the socio-economic impact of COVID-19 and mental health, the impact of COVID-19 on family and social life, the healthcare system during COVID-19 in South Africa and holistic health and well-being. This chapter also includes the research problem statement, the aim and objectives of the research, the research questions, the rationale of the study, the significance of the research, the theoretical framework and the outline of the dissertation.

1.2 Background of the study

History informs of the greatest pandemics that have plagued societies, from malaria and tuberculosis to influenza and smallpox (Huremović 2019). A formidable new pandemic unfolded in the 21st century, known as severe acute respiratory syndrome coronavirus disease 2 (SARS-CoV-2). In December 2019, a report about a type of pneumonia of idiopathic origin was made by the *Program for Monitoring Emerging Diseases* (Bloom *et al.* 2021). The cause was soon discovered to be a novel virus belonging to the β group of coronaviruses with its probable origin in the city of Wuhan, China; however, the development and true origin of this novel virus remain a mystery that is eluding the scientific community (Shereen *et al.* 2020). The coronavirus disease 2019 (COVID-19) spread rampantly throughout the world, bringing with it a widespread calamity affecting millions of people, resulting in a declaration of a global pandemic by the World Health Organization (WHO) on 11 March 2020 (Angoulvant *et al.* 2020; Shereen *et al.* 2020). This new virus was named SARS-CoV-2 as it shared similar genetic features to its antecedent, severe acute respiratory syndrome (SARS-CoV), the virus responsible for the acute respiratory distress syndrome (ARDS) (Yuki, Fujiogi and Koutsogiannaki 2020). Although coronaviruses have previously been a predominant animal virus, the 21st century has seen the advent of new infections in humans, which is cause for concern

as the coronaviruses can lead to severe respiratory complications (Da Costa, Moreli and Saivish 2020).

Severe acute respiratory syndrome (SARS-CoV)

In 2002 and 2003, China witnessed a sharp rise in infections from the coronaviruses, specifically owing to infections from the novel severe acute respiratory syndrome (SARS-CoV). This disease resulted in a pneumonia-like respiratory disease manifestation with apparent clinical features of a dry cough and pyrexia of $>38^{\circ}\text{C}$ (Da Costa, Moreli and Saivish 2020). The disease process of the SARS-CoV is distinguishable by the severe damage inflicted on the lung, which consequently resulted in 775 deaths with a mortality rate of 17%, resulting from 8273 cases in 37 countries (Zeidler and Karpinski 2020). A fortunate turn of events occurred in July 2003 in Taiwan, whereby the transmission of SARS-CoV was disrupted, which allowed for a control and subsequent decline in the spread of the virus (Zhu *et al.* 2020).

Middle East respiratory syndrome (MERS-CoV)

In 2012, a new coronavirus identified as the Middle East respiratory syndrome (MERS-CoV) had emerged. While being similar to SARS-CoV due to clinical features of a pneumonia-like respiratory disease, MERS-CoV was more severe with a morbidity rate of 34.3%, as compared to its predecessor SARS-CoV with 17% (Da Costa, Moreli and Saivish 2020; Zeidler and Karpinski 2020). Jordan recorded the first case of MERS-CoV in April 2012; however, this human coronavirus (hCoV) has still not been eradicated with recent laboratory tests in Riyadh in March 2020 exhibiting positive tests for MERS-CoV, consequently occurring during the emergence of the SARS-CoV-2 pandemic (Zhu *et al.* 2020).

1.2.1 The emergence of COVID-19 in South Africa

An unprecedented devastation dawned in the second decade of the 21st century with a novel coronavirus. This new and highly infectious virus largely surpassed the two preceding coronavirus outbreaks, namely SARS-CoV and MERS-CoV and as a result, caused a massive surge of infections reaching pandemic status, as declared by the WHO (Angoulvant *et al.* 2020; Hu *et al.* 2021). The new hCoV globally known as SARS-

CoV-2 or COVID-19 has uncertain origins with speculations that the virus originated in Wuhan, China's Huanan seafood market (Hu *et al.* 2021). Further theories suggest that bats, pangolins and turtles smuggled from Malaysia to China could have been the origin of the virus (Lotfi, Hamblin and Rezaei 2020). However, the origin of SARS-CoV-2 remains inconsequential, when compared to the havoc it has caused on human tragedy and the economy (Broadbent, Combrink and Smart 2020). The researcher adapted information from Broadbent, Combrink and Smart (2020: 1-5); Giandhari *et al.* (2021: 234-241) to illustrate a timeline of events from the onset of COVID-19 in South Africa and the resultant actions by the South African government to mitigate the spread of SARS-CoV-2 as follows:

5 March 2020	• The first case of COVID-19 in South Africa
13 March 2020	• The first local transmission in South Africa
15 March 2020	• A national state of disaster is implemented
27 March 2020	• National lockdown for 21 days
27 March 2020	• First COVID-19 death in South Africa
9 April 2020:	• The level 5 lockdown is extended to April 2020
1 May 2020	• Level 4 lockdown implemented
13 July 2020	• Level 3 lockdown implemented
19 August 2020	• Level 2 lockdown implemented
21 September 2020	• Level 1 Lockdown implemented

Figure 1.1: A timeline of events during the COVID-19 pandemic in South Africa

The diagram depicts a timeline of events in South Africa in relation to COVID-19. Note: The data above is adapted from Broadbent, Combrink and Smart (2020: 1-5) and Giandhari *et al.* (2021: 234-241).

The lockdown was a necessary measure used by many countries to limit the spread of the virus. In South Africa this was done according to alert levels 1 to 5 according to a risk-adjusted approach that was based on certain factors, namely the level of infection, transmission rate of SARS-CoV-2, the ability of the healthcare system to maintain capacity, public health interventions in place and the added impact on the economy and social life during restrictions (The South African Government 2022). The South African Government (2022) strategised the lockdown levels as follows:

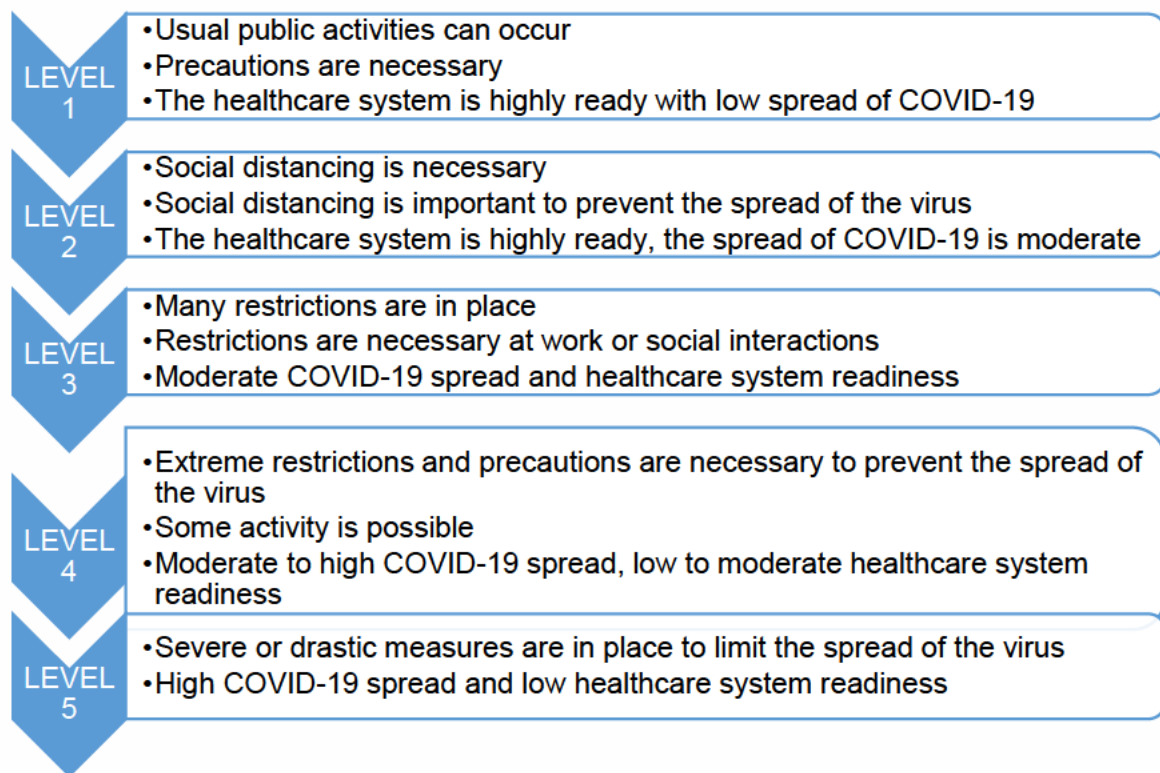


Figure 1.2: An illustration of the alert levels of the lockdown in South Africa

The diagram illustrates the lockdown alert levels implemented by the South African government to limit the transmission of COVID-19. The diagram also indicates when different levels of lockdown are implemented according to the readiness of the South African healthcare system (The South African Government 2022).

In a bid to establish control over the COVID-19 pandemic and limit the spread of the virus, the South African government implemented extensive measures on the South African public through the Disaster Management Act (Moodley, Obasall and London 2020). However, some of these restrictions drastically affected the retail industry, with considerable impacts on clothing and textiles. The added restrictions on alcohol and tobacco sales also affected employment and loss of revenue (Redda 2021). Strict measures allowed non-consenting COVID-19 testing amongst those suspected of being infected with the virus, and if found to be positive, had to enter a mandatory period of quarantine. Refusal of these measures could risk prison time. Furthermore, the restrictions on gatherings and movement were enforced by the South African National Defence Force (SANDF) and South African Police Service (SAPS) through harsh means by using rubber bullets and intimidation (Staunton, Swanepoel and Labuschaigne 2020).

1.2.2 COVID-19 and its implications on people with co-morbidities

Co-morbidity is a medical state in which two or more conditions affects a person's health concurrently (Harrison *et al.* 2021). Communicable and non-communicable diseases are on the rise globally. South Africa in particular faces a high burden of the human immunodeficiency virus (HIV) and tuberculosis (TB), which often occur as co-infections (Schlüter *et al.* 2021). Further, according to Statista (2021), the South African healthcare system is burdened with other groups of diseases such as cardiovascular diseases (CVDs), respiratory diseases, diabetes mellitus (DM), cancer and dyslipidaemia disorders. While COVID-19 infects individuals equally, the risk of developing severe illness and becoming critically ill from COVID-19 is much higher in those individuals with co-morbidities (Ye *et al.* 2020). This is essentially due to the lowered immune system of the patient, which occurs because of a decreased immune response from the disease process.

Furthermore, certain chronic medications, like steroidal drugs, used in the treatment protocol for autoimmune diseases tend to lower the immune response (Barlow-Pay *et al.* 2021). Many of the lifestyle diseases, such as dyslipidaemia, DM, CVDs and even obesity, tend to have a much higher rate of severity. This is largely due to the above-average expression of the angiotensin-converting enzyme-2 receptor that occurs in these conditions, which SARS-CoV-2 uses as an access point for infection (Anjorin *et al.* 2021). Another factor affecting patients with co-morbidities is the excessive damage to organs that occurs after the COVID-19 infection. Additionally, the improper control and treatment of co-morbidities tends to aggravate the COVID-19 infection, as in the case of DM, in which uncontrolled glucose levels, leads to a worse prognosis of COVID-19. Respiratory conditions tend to become more severe, primarily attributable to the fact that SARS-CoV-2 uses the respiratory tract as a point of entry into the body often leading to lung damage (Sanyaolu *et al.* 2020).

In patients with co-morbidities, mental health and well-being are concerning factors. This is primarily due to their higher risk of disease severity and the resultant fears, anxiety, depression and stress that ensue. This is further complicated by the restrictive measures put in place to limit the spread of SARS-CoV-2, which promote physical distancing and isolation (Sayeed *et al.* 2020). Good mental health and well-being are important in maintaining morale in tough situations; however, the COVID-19 pandemic has severely dampened morale, especially in individuals with co-morbidities.

1.2.3 The socio-economic impact of COVID-19 and mental health

The South African government acted quickly to impose lockdowns and other mitigation measures to limit the spread of COVID-19, despite being a developing country. South Africa's responsible effort in imposing lockdowns and other mitigation measures were well received by the WHO. This decision resulted in an inevitable decline in the South African economy, which led to high rates of unemployment, loss of revenues and an ailing economy (Arndt *et al.* 2020; de Villiers, Cerbone and Van Zijl 2020). Arndt *et al.* (2020) analysed the impact of the lockdown on food security and income; the study yielded results showing that an unequal distribution of income occurred between education levels. There is a premise that shows that people from low-education backgrounds with more unskilled labour-intensive jobs, experienced more economic distress than people with higher-education jobs, further intensifying food insecurity. This posed a concern as South Africa faced high unemployment levels among unskilled labourers as the economy slowed production capacity (Chitiga-Mabugu *et al.* 2021).

Further, South Africa employs more than one-third of its workforce in the informal sector with additional burdens of food security among many households (Broadbent, Combrink and Smart 2020). As the world battled COVID-19 infections, Africa's limitations became exposed. Africa experienced an increase in food and nutritional deficits affecting millions of its citizens with approximately one-fifth of the African population being malnourished (Chiwona-Karlton *et al.* 2021). The lockdown, while vital, caused major disruptions in the livelihoods of people, disturbances in the agricultural sector, upon which the majority of the population is largely dependent, food distribution and interruptions of the fundamental supply chains that support the economy (Chiwona-Karlton *et al.* 2021). The lockdown, particularly in South Africa, further exacerbated issues around unemployment, food insecurity and poverty (Kollamparambil and Oyenubi 2021).

The mental health of individuals became largely deteriorative, which occurred commensurate with the socio-economic disruptions in the economy. Research indicates that many individuals faced precarity due to unemployment, food security and the added pressure of a lack of employment opportunities (Lu and Lin 2021). The lockdown and restrictive measures have also placed added stress on people's daily lives, which limited their ability to travel and interact. Another pressing concern was the higher rates of

unemployment and financial instability, which drastically affected mental well-being and are a concern for deleterious mental health status (Nagasu, Muto and Yamamoto 2021). This was highlighted by Lei *et al.* (2020) who noted the causes of poor mental health in relation to unemployment during the pandemic in China and found that higher levels of anxiety and depression were linked to lower income, which was attributable to the quarantine that prevented people from working and seeking means to address their financial problems. Furthermore, the added pressure of financial loss compounded anxiety. In South Africa, the pressures around unemployment and financial instability were evident, in this vein Nguse and Wassenaar (2021) emphasised that unemployment and food insecurity caused by the lockdown increased fear and anxiety in people.

1.2.4 The impact of COVID-19 on family and social life

Family and social well-being were negatively impacted by the onset of COVID-19, which was mostly attributed to the lockdown. A new norm of work-from-home resulted in added pressures on family life. Issues of inequalities between males and females were exposed and further intensified as females had to fulfil more household-related responsibilities. Parents became stressed from having to care for their children, teach and help them with homework, while working from home (Fisher *et al.* 2020). During the pandemic, family harmony emerged as a particular concern, characterized by family members' belief in their own performance in everyday life and satisfaction in their relationships with each other (Afifah 2021). This virtue of family harmony was affected on various levels because of disruptions in employment contributing to loss of income, family conflicts and financial burdens (Afifah 2021). South Africa accounted for between 2.2 and 2.8 million job losses early in the pandemic (Posel, Oyenubi and Kollamparambil 2021). This added stressor can drastically affect the lives of a family unit, resulting in fears of food insecurity (Adebiyi *et al.* 2021). Consequentially, financial instabilities and job insecurity can have negative effects on mental well-being, resulting in poor mental health (Gadermann *et al.* 2021). Further, research has found that having family members who tested positive for COVID-19, increases the anxiety levels of individuals (Saladino, Algeri and Auriemma 2020).

However, despite the negative effects that the COVID-19 pandemic had on families, research also indicates the potential for family resilience during the pandemic (Canzi *et*

al. 2021). The lockdown allowed for increased bonding between family members. Moreover, anxiety and depression caused by the pandemic were drastically reduced owing to the strengthened bonds between family members as a result of spending more time together (Alfawaz *et al.* 2021).

The usual social interactions between people were abrasively halted commensurate with the COVID-19 level 5 lockdown that was implemented on 27 March 2020, in South Africa (Giandhari *et al.* 2021). Social interactions are a requisite that assists people in overcoming challenges related to stressful situations such as a pandemic (Osofsky, Osofsky and Mamon 2020). As a consequence of the lockdown, many people became physically isolated, leading to increased incidences of anxiety and depression attributed to loneliness and a lack of personal coping mechanisms (Tull *et al.* 2020). While mitigation measures are necessary to reduce the progression of the COVID-19 pandemic, they also hamper and have deleterious consequences for the most vulnerable groups, in particular those who are prone to anxiety, depression and stress (Saladino, Algeri and Auriemma 2020). The psychosocial well-being of individuals with co-morbidities was heightened as they exhibited fears of becoming infected due to their deteriorative health as well as their increased susceptibility to infection (Al-Qahtani, Elgzar and Ibrahim 2020). Furthermore, social isolation led to feelings of loneliness, which in turn contributed to the use of drugs, alcohol, smoking and other harmful behaviours, all of which could exacerbate pre-existing illnesses (Greig *et al.* 2022). While many countries, including South Africa, imposed restrictions on social distancing and gatherings, the impact of family and social life was intense and stringent with many adverse outcomes.

1.2.5 The healthcare system during COVID-19 in South Africa

As at January 2024 4.08 million COVID-19 cases were confirmed through laboratory testing, with the death toll reaching 102 595 (Andra farm 2024). Prior to the onset of COVID-19 pandemic, the South African healthcare system was already strained with high numbers of tuberculosis (TB) (Walt *et al.* 2018) and human immunodeficiency virus (HIV) (Ugwu and Ncayiyana 2022) patients with the additional non-communicable diseases (NCDs) that plague many communities (Roomaney *et al.* 2021). The public healthcare facilities across the country attend to more than 80% of the population. The

onset of COVID-19 caused far-reaching repercussions in the already-ailing healthcare system. The healthcare system faced many shortcomings during the COVID-19 pandemic, such as shortages of personal protective equipment (PPE) that ranged from masks to protective overalls and gloves, supply chain interruptions and staff shortages (Mbunge 2020).

SARS-CoV-2 infection is highly contagious and deadly, particularly in patients older than 60 years and in persons with co-morbidities (Feng *et al.* 2020). The capacity of the hospitals across the country needed to be enhanced, as early data from China showed that 15% of patients who developed severe COVID-19 infections needed to be hospitalised and 5% of patients who reached critical status needed to be admitted into an intensive care unit (ICU). The estimated capacity of ICU beds in South Africa ranges between 3300 and 7000 beds. An estimated 20000 and 35000 ICU beds were needed between July 2020 and November 2020, according to projected models by the South African COVID-19 Modelling Consortium (Naidoo and Naidoo 2021).

Initial reactions from patients on TB and HIV treatment were decreased mental well-being and a fear of becoming infected by COVID-19, which led to many missing medical appointments for the collection of medication (Matatiele, Stiegler and Bouchard 2021). A global interruption of the supply chain due to lockdowns and restrictions caused an encumbrance in the supply of chronic medications (Clement, Jacobi and Greenwood 2021). In many countries, patients on chronic medication for conditions like HIV, TB, DM, CVDs, respiratory diseases, cancer and mental health conditions were largely affected. This was due to lowered immunity, which increased the likelihood of COVID-19 infection. Additionally, the resultant stress- and anxiety-provoking impact of the COVID-19 pandemic could have dire consequences for people with stress-linked diseases such as CVDs and mental ailments (Kretchy, Asiedu-Danso and Kretchy 2021). Adherence to maintaining chronic therapies and patient safety has been a major concern in South Africa. With this concern in focus, the Metropolitan Health Services in Cape Town began home deliveries of chronic medication (Mash *et al.* 2022). A further problem around cancellation and postponement of elective surgeries caused backlogs and low mental well-being in patients (Chu *et al.* 2021).

1.2.6 Holistic health and well-being

The world battled COVID-19 as it wreaked havoc in many communities causing high transmission rates and a high number of deaths globally. However, Africa saw a marginally lower number of cases and fatalities, which could be attributed to the low testing numbers as evidenced in research (Maeda and Nkengasong 2021). Conversely, another assumption is that African countries rely on alternative and complementary medicines. Africa is a substantial consumer of alternative treatments with more than 80% of the African population using the various forms of complementary medicines as primary healthcare (Iwuoha, Ezeibe and Ezeibe 2020). South Africa is no exception, as around 70% of the population uses traditional medicine as a form of treatment (Bhuda and Marumo 2020). The National Centre for Complementary and Integrative Health (2020) advises caution when using alternative treatments like phytotherapy, essential oils and vitamins, as research suggested a lack of effectivity against COVID-19 and, in certain instances, safety concerns. However, research by Iwuoha, Ezeibe and Ezeibe (2020) indicates that the use of local herbal remedies is beneficial in reducing COVID-19 mortality rates. An increase in queries on information about supplements had increased during the COVID-19 pandemic, most notably those that offered enhanced immune function (Paudyal *et al.* 2022). A cross-sectional study among 560 healthcare workers in Jordan found that 64.1% used complementary medicine like vitamins, minerals and herbal medicines. Of the study participants, 17.9% viewed these practices as effective for preventing COVID-19, although 8.5% reported negative effects of these practices, such as vomiting and diarrhoea. The authors concluded that further research is needed to understand the safety of complementary medicines (Bulatova *et al.* 2022).

1.3 Research problem statement

There is consensus in the research and medical literature that co-morbidities affect the severity and outcome of COVID-19, leading to an unfavourable prognosis, while directly causing systemic disease manifestations (Polack *et al.* 2020; Sanyaolu *et al.* 2020). Studies have also explored how viral outbreaks like MERS-CoV and SARS-CoV affect the mental well-being of individuals, often resulting in emotions of fear and anxiety (Jeong *et al.* 2016; Khan *et al.* 2020b). The coronavirus disease of 2019 was directly responsible for people and patients with co-morbidities feeling fear, anxiety, stress and

depression. Additionally, the lockdown caused socio-economic disruptions and sub-standard livelihoods (Ogah *et al.* 2021). These harsh constraints have compromised the mental health and well-being of people across the globe. South Africa is a middle-income country and was therefore no exception to the onslaught of the waves that the COVID-19 pandemic imposed (Arndt *et al.* 2020). The COVID-19 pandemic impacted the family and social lives of many individuals (Alfawaz *et al.* 2021; Greig *et al.* 2022). Furthermore, the healthcare of many chronically ill patients was also impacted, causing them to miss medical appointments, neglect their treatments, and experience disruptions in elective surgical procedures (Nyasulu and Pandya 2020; Chu *et al.* 2021).

COVID-19 is a relatively new disease and the generation of research papers has been proliferated globally (Sloane and Zimmerman 2021). Despite this, the research on the impact of COVID-19 from the perspective of patients with co-morbidities, particularly within the context of South Africa, has been minimal (Phaswana-Mafuya *et al.* 2021). Patients with co-morbidities, who have been impacted the most, throughout the COVID-19 pandemic due to their lowered immunity and poor mental health, are a particularly vulnerable group (Zádori *et al.* 2020). Further, the impact on their family and social lives was substantial in relation to bonding, conflicts and support (Thomeer, Yahirun and Colón-López 2020). Their illnesses have resulted in an added burden on themselves and their families during the pandemic; additionally, their coping mechanisms may have been insufficient, resulting in deteriorating mental health with resulting stress, fear and anxiety (Pretorius *et al.* 2021). Co-morbidities played a significant role in how COVID-19 progressed. Cardiovascular diseases like hypertension increased the likelihood of death, due to the extensive stress on the heart from SARS-CoV-2. In addition, patients hospitalised due to COVID-19 suffered myocardial injuries (Cao *et al.* 2021). The respiratory system is an entry point for SARS-CoV-2 and therefore, people with respiratory co-morbidities were at high risk of severe illness from the virus. Therefore, conditions like asthma and tuberculosis were risk factors for COVID-19 (Brosnahan *et al.* 2020). Digestive and urinary system diseases were also posed to enhance COVID-19 progression through microbiological activity from the virus and the presence of ACE-2 receptors. Thus, people with irritable bowel disease and chronic kidney disease were also at risk (Hassanein *et al.* 2020; Hunt *et al.* 2021).

There is no doctoral study that has explored the impact of COVID-19 on patients with co-morbidities and aimed to understand the patients' perspectives on how COVID-19

has affected their physical and mental health, as well as their family and social life and receipt of healthcare within the context of South Africa. The first COVID-19 case in South Africa was recorded in KwaZulu-Natal, and that escalated exponentially to over 500 000 confirmed cases, with an unprecedented number of deaths that exceeded 14000 by March 2021 (Nxumalo and Mchunu 2021). KwaZulu-Natal also has a high number of co-morbidities with hypertension and diabetes being prevalent (Kushitor *et al.* 2020). Therefore, to explore the influence of COVID-19, a clinic in Phoenix in the eThekweni municipality of KwaZulu-Natal was selected for convenience of participant recruitment as it reduced travel times and costs. Furthermore, the clinic provided access to patients, ensuring adequate recruitment for a deeper insight into the problem (Hurtado-Chong *et al.* 2017).

This doctoral research study endeavoured to fill the research gap and further broaden the understanding of two groups of patients with co-morbidities who were previously infected by COVID-19 (post-three months) and affected by COVID-19 (not infected by SARS-CoV-2 but affected by COVID-19 pandemic). This study utilised thematic analysis, which allowed for a greater depth in the understanding of patients and how the COVID-19 pandemic affected these two groups of patients. The healthcare system should always focus on the patient. This research focused on patients. In addition, the study gathered the patients' perspectives, which can assist policy makers in the healthcare system in providing better patient care. The recommendations made from this study were based on patients' responses on how to improve their holistic health and well-being through improvements in healthcare and health system strategies.

1.4 Aim of the research

To understand how the COVID-19 pandemic affected the physical and psychosocial well-being of people living with a co-morbidity or co-morbidities.

1.5 Research objectives

1. To enquire how COVID-19 affected the physical health of persons with a co-morbidity.

2. To understand how COVID-19 affected the mental health of those infected and affected persons with a co-morbidity.
3. To explore how the family and social life of these persons were affected by the virus.
4. To understand how those infected and affected received healthcare within the context of the pandemic.
5. To explore what alternative and holistic therapies both infected and affected persons used to ensure their optimal health.
6. To make recommendations with regards to improving the holistic well-being of those recovered and affected persons with co-morbidities.

Research questions

1. How has COVID-19 affected the physical health of people with a co-morbidity, in both affected and infected?
2. What impact has COVID-19 had on mental health in both infected and affected groups with co-morbidities.
3. How has COVID-19 impacted the family and social dynamics of people with co-morbidities in both affected and infected groups?
4. How did both groups of people affected and infected receive healthcare within the context of the pandemic?
5. What alternative and holistic therapies were used by both infected and affected groups to ensure their optimal health?

1.6 Rationale for the study

When a person has more than one disease at a given time, the phenomenon is called co-morbidity (Gillespie 2021). An example of this is a person who has both osteoarthritis as well as hypertension. It is important to note that co-morbidities are on the rise in the recent decade in South Africa, as well as the global population. This is particularly due to lifestyle as well as a constantly ageing population. A more concerning aspect is that these co-morbid diseases often occur in what is known as multi-morbidities (Kushitor *et*

al. 2020). Since the start of the global COVID-19 pandemic, there has been common agreement that co-morbidities in persons infected with coronavirus often lead to severe health complications and can drastically affect a person's prognosis and future health (Sanyaolu *et al.* 2020). According to the Centre for Disease Control and Prevention (CDC), having a co-morbidity puts a patient at a higher risk of developing severe complications regardless of their age (Centre for Disease Control and Prevention 2021). The CDC provided a rigorous list of chronic conditions to illustrate the risk groups and dangers faced by patients who contract COVID-19. These conditions include cancer, diseases of the kidney and liver, various respiratory diseases such as TB and chronic obstructive pulmonary disease (COPD), psychiatric disorders, CVDs, HIV and obesity (Centre for Disease Control and Prevention 2021).

The mental well-being of individuals was affected considerably during the COVID-19 pandemic. This effect is a complex and multi-faceted concern. Various contributing factors caused stress, anxiety, depression and even suicidal ideation during the pandemic (Pompili *et al.* 2022). South Africa faced severe socio-economic challenges like unemployment and food insecurity induced by the COVID-19 pandemic. Additionally, restrictions like social distancing and isolation put in place as counter measures severely distressed the lives of many individuals (Arndt *et al.* 2020). A further pressing concern was the impact of COVID-19 on the mental well-being of individuals with co-morbidities. Research has shown that COVID-19 and other pandemics often provoke emotions of anxiety, stress and depression (Dubey *et al.* 2020).

The psychosocial impact as explored by Dubey *et al.* (2020) involves many areas of research exploring the mental well-being of the population like, mass hysteria elicited by social media, the effect on children and the elderly and healthcare workers, the impact of COVID-19 on persons specifically with psychiatric illnesses and even the vulnerable population like the homeless, prisoners and immigrants. Further, disruptions in family and social lives were massively impacted at the onset of COVID-19 owing to work-from-home situations, isolation, social distancing, quarantines and financial insecurities (Mbunge 2020; Gittings *et al.* 2021). The repercussions of family and social impacts have significantly impacted mental health and well-being. Research also indicated that the restrictions placed on people can have negative consequences on pre-existing health conditions, as people in isolation tend to adopt harmful behaviours. These harmful behaviours, namely alcohol abuse and drug abuse, occur because of a lack of coping

mechanisms in certain individuals resulting from social isolation and loneliness (Komiyama and Hasegawa 2021).

The South African healthcare system faced considerable problems during the course of COVID-19, as shortages of beds and limited resources imposed a strain. Patients on chronic medication and treatments for their respective conditions were alarmed at the dangers of the pandemic, which resulted in the cancellation of medical appointments and not collecting vital medications (Matatiele, Stiegler and Bouchard 2021). Many individuals turned to alternative or complementary treatments to aid them in gaining holistic health and well-being. This factor is significant as more than 70% of the South African population is dependent on traditional medicines (Bhuda and Marumo 2020).

The coronavirus 2019 pandemic is relatively new; however, research generated during the pandemic is immense with data cited from Scopus as of 1 August 2021, by Ioannidis *et al.* (2021) indicating that 210 183 COVID-19-related articles were published. The above paragraphs mentioned some of the impacts of COVID-19, related to the effects it had on co-morbidities in both the physical and mental domains, the impacts on family and social well-being, the healthcare system and holistic health and well-being. Research was conducted in all the aforementioned areas internationally. However, there is a paucity of research within the context of South Africa relating to the various objectives of this study. The geographical location of the study was tantamount to achieving rich data, as the first recorded case of COVID-19 was located in KwaZulu-Natal. This resulted in increased levels of infections, with more than 500 000 cases and 14 000 deaths by March 2020 (Nxumalo and Mchunu 2021). KwaZulu-Natal faced significant socio-economic burdens with high levels of unemployment (Hlongwa and de Wet 2019). The suburb of Phoenix was one the many areas affected by the COVID-19 pandemic, as people within this community, experience, sub-standard livelihoods, unemployment and poverty (Phoenix Child Welfare 2020). Therefore, a public clinic in Phoenix, eThekweni in KwaZulu-Natal, was selected to access patients with co-morbidities who were affected by the COVID-19 pandemic. The study location provided a sample of the general population, which provided rich data and gave insight into their daily lives and challenges.

Further, an exhaustive search found no doctoral-level qualitative research studies have been conducted that aim to explore patients' perspectives on how COVID-19 impacted their lives on various levels according to the objectives of the study, especially within the

context of South Africa. This doctoral study's design further aimed to increase the knowledge base on the two groups of individuals, namely those infected by COVID-19 and those affected by COVID-19. Therefore, offering a novel perspective at the doctoral level, giving insight into how the two groups dealt with various challenges according to the context above that were imposed upon them during the COVID-19 pandemic.

Qualitative studies provide the deepest insight of human behaviour, capturing perspectives and insights that cannot be quantified. Therefore, the choice of a qualitative methodology was appropriate in its ability to understand the multi-dimensional influences of COVID-19 on people with co-morbidities through interviews (Cleland 2017). Moreover, the design also allowed for non-standardised data in the form of interview responses rather than numbers to be analysed (Flick 2014). In addition, the qualitative method proved beneficial as the data analysed could be viewed from the perspective of the individuals involved, allowing for a deeper understanding of their lives and how they were affected by COVID-19 (Rahman 2016). According to Cleland (2017), the qualitative method seeks to inquire on the "how", which reflects the research questions of this study.

This qualitative study also highlights various co-morbidity conditions within South Africa and how COVID-19 impacted these conditions on a physical level, while also exploring how individuals with these conditions were affected mentally. Family well-being was considerably impacted during periods of lockdown. This study aims to unravel and understand this impact from the viewpoint of the patient and explore what complications or resolutions that arose. Clarity is needed with respect to the social impacts of COVID-19 in South Africa, in particular, for those individuals with pre-existing medical conditions. An international study showed that individuals who faced isolation and loneliness adopted harmful behaviours, namely alcohol and drug abuse, to combat the effects of loneliness (Greig *et al.* 2022). An exploration among South Africans will give insight into the local arena and help gain insights into the lives of everyday South Africans in the context of family and psychosocial well-being.

This study explores the patients' perspectives and their abilities to obtain optimal healthcare during the pandemic while understanding the challenges that many patients faced while trying to retrieve medications and treatments. Further, a comparison of various alternative treatments and therapeutics used by the public is explored to gain an understanding of how holistic health was achieved on a doctoral level. Therefore, this

study proves to be valuable in that it will ascertain and compare the different holistic therapies patients utilised during the pandemic to ensure optimal health.

1.7 The biopsychosocial model

The theoretical framework is an important aspect of a dissertation that serves as a building block or foundational backbone. It is a well-established theory that guides and drives a study and is used as a fundamental underpinning to construct the dissertation, while grounding the structure of the study in accordance with the aims, objectives, research questions, rationale and significance of the study (Osanloo and Grant 2016). However, for the purposes of this study, the biopsychosocial model (Figure 1.3) will be viewed as a paradigm that influenced an understanding of the study (DeCarlo, Cummings and Agnelli 2021).

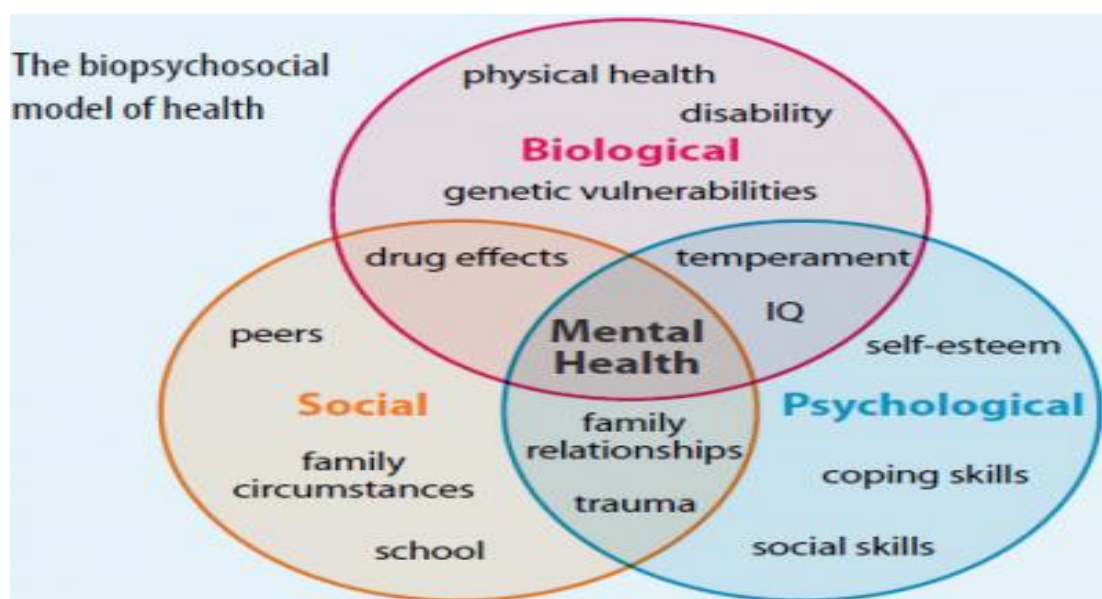


Figure 1.3: The biopsychosocial model

The diagram illustrates the biopsychosocial model with the interplay between the biological, social and psychological factors. Note: adapted from Physiopedia (2022)

The biopsychosocial model is a well-established theoretical model developed by Engel (1977). The biopsychosocial model integrates the various factors that affect humans and contribute to their diseases. The model is a construct of the social, biological (physical) and psychological paradigms that are determinants of health and well-being. The model also establishes that the health of a person on a physical level is largely dependent on

their social and mental status. Engel formulated the biopsychosocial model because he saw limitations in the biomedical model that excluded important aspects of the patient and their care. A myriad of limitations were present, namely, the inability of the model to consider the person with the disease, the experiences of the individual with the disease, the individual's outlook towards the disease, the care of the patient and the healthcare system (Bolton and Gillett 2019).

The usefulness of the biopsychosocial model lies in its interplay between the three paradigms of physical, psychological and social factors. In the primary healthcare setting, clinicians can assess the patient based on these three factors. This assessment and implementation of the model, fosters a dyadic patient-doctor relationship, albeit this is a time-consuming process owing to the individuality and uniqueness of patients (Kusnanto, Agustian and Hilmanto 2018). Common applications of the biopsychosocial approach include functional and chronic disorders. Irritable bowel syndrome (IBS) is a common condition that indicates no structural abnormalities; however, symptoms indicate illness in the patient, such as diarrhoea or constipation, bloating and flatulence. The biopsychosocial model indicates treatment with medication that addresses the biological approach and psychological therapy that addresses the psychosocial aspects that are related to stress and anxiety (Kusnanto, Agustian and Hilmanto 2018).

The COVID-19 pandemic has a multi-factorial effect on patients due to the various challenges that it causes and subjugates to individuals. The literature suggests that COVID-19 has multiple impacts on people's lives. These include the impact on physical and mental health and well-being, the worsening of chronic conditions and the repercussions on family life. In addition, social lives of people are impacted, causing feelings of loneliness and isolation. Furthermore, the livelihoods of people are impacted stemming from the socio-economic disruptions (Laher *et al.* 2021).

In accordance with the aim of this study, which is to understand how the COVID-19 pandemic affected the physical and psychosocial well-being of people living with a co-morbidity or co-morbidities, the researcher deduced that the biopsychosocial model was the best-suited theory to guide the study. Additionally, the various objectives underpinning, this doctoral study further supported the use of the biopsychosocial model as a fundamental guide to understand how the biological, psychological and social aspects influenced the health and mental health well-being of those with co-morbidities. This helped guide the study's construction and its objectives. People with co-morbidities

are at risk of disease severity and deteriorative health. Additionally, COVID-19 causes new systemic disease manifestations in the body (Ye *et al.* 2020), which can be attributed to the 'bio' part of the biopsychosocial model. There is also a significant impact on the mental health of chronically ill patients and previously healthy patients (Laher *et al.* 2021) that coincides with the 'psycho' aspect of the model. The COVID-19 pandemic had considerable impacts on livelihoods, families and social lives partly due to the virus and partly due to the socio-economic challenges and restrictions faced by many countries (Arndt *et al.* 2020; Fisher *et al.* 2020), which is congruent with the social facet of the model. Healthcare and holistic health are other aspects included in this doctoral study that have been significantly impacted (Walt *et al.* 2018).

These various challenges indicate a high level of significance and further promulgate the use of the biopsychosocial model, as it covers all aspects of this research design. This study aims to attain patient perspectives on the various areas mentioned and to make recommendations on improving holistic health and well-being. The biopsychosocial model largely depends on the patient and their experiences, thus adding to the appropriateness of the model. Engel (1977) asserted that a link exists between physical and mental health, which is corroborated by Ohrnberger, Fichera and Sutton (2017). These findings further advocate for the suitability of the biopsychosocial model. This shows significance as people with co-morbidities are often subjected to negative consequences in times of distress, such as a pandemic. The outcome of this predicament could be detrimental to their co-morbidities. Castro *et al.* (2016) mention that patients should be involved in their healthcare, which is commendable. The writer further mentions the role that patients have in developing legislation and policies around healthcare, as patients are experts of their own health. This view is shared by Engel (1977), as the biopsychosocial model integrates patients views in determining appropriate healthcare. The biopsychosocial model displays the necessary capacity as an exemplary guide for the theoretical framework for this study.

1.8 Outline of the thesis

The outline includes all chapters in this thesis with a description of the contents of the chapters.

Chapter 1: Overview of the study

This chapter provided an overview of the study by elucidating the background information on COVID-19 and its implications for people with co-morbidities. Further, the chapter provided the problem statement, aim, objectives and research questions, while describing the motivations, rationale and value of the study. A theoretical framework is described and serves as a guide for the study.

Chapter 2: Literature review

The literature review aims to provide a comprehensive and thorough overview of evidence on the impact of the COVID-19 pandemic on people with co-morbidities. This delves into both the mental and physical impact of COVID-19 on people with co-morbidities as well as the mechanisms through which SARS-CoV-2 influences these co-morbidities. The chapter further explores family and social dynamics during the pandemic with their possible repercussions; the healthcare system in relation to how individuals with co-morbidities were affected as recipients of healthcare; and holistic health and complementary and alternative medical options utilised by the patient.

Chapter 3: Research methodology

The research design and method used for the study are described. The population, sample and research tools are fully discussed. Furthermore, the data analysis methodology utilising thematic analysis is explained. The qualitative aspect of the study and the ethical considerations are comprehensively described.

Chapter 4: Research results, analysis and discussion

The findings and data of the research are arranged in this chapter according to the thematic analysis paradigm. Themes and sub-themes are formulated based on the data collected during the interview and are arranged accordingly. This chapter also discusses the research findings and formulated themes.

Chapter 5: Summary of findings, conclusions and recommendations

This chapter provided the summary of findings, conclusions and recommendations. Recommendations are discussed according to the objectives of the study. The recommendations discussed are an advisory to improving holistic health. Furthermore,

recommendations for future research are discussed. The limitations and strengths of the study are also elucidated.

1.9 Summary of the chapter

This chapter served as an introduction to the study and provided an overview and outline of the study. The various aspects of COVID-19 in relation to its multi-faceted impact on patients with co-morbidities were explored. These areas included the physical and mental impact of COVID-19 on people with co-morbidities, the impact of COVID-19 on the family and social lives of these individuals, the impact of COVID-19 on the healthcare received by these individuals and how they maintained holistic healthcare through alternative and complementary therapeutics. Further areas of the introductory chapter included the research problem statement, the aim of the research, the research objectives and research questions, the rationale and significance of the study, the theoretical framework that guides the study and the outline of the thesis.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter will review the current and available literature on COVID-19 with an in-depth review of the severe acute respiratory syndrome coronavirus disease 2 (SARS-CoV-2) in relation to its taxonomy, structure, variants and mutations, zoonosis and transmissibility, symptomatology, laboratory diagnosis, prognosis and treatment. Thereafter, an exploration and review of the impact of COVID-19 on patients with co-morbidities will be conducted. Attention will be given to the physical and mental impact of COVID-19 on patients with co-morbidities. Additionally, the family and social dynamics in relation to the COVID-19 pandemic will be reviewed, while evaluating the impact of COVID-19 on the healthcare system and how patients received healthcare, while being heedful to patients with co-morbidities. Alternative treatments utilised during the pandemic will also be assessed to provide an overview of how patients attained holistic health. The literature review is a conglomerate of various aspects namely, the biological, psychological and social aspects, as elaborated in the following chapter.

The coronavirus pandemic is affecting the global population in many spheres. Many lives have been lost with economic disruptions and the added strain on mental health. In South Africa, COVID-19 had a major impact on the economic progression leading to high rates of unemployment and poverty. This circumstance hampered the mental health and well-being of many people, either exacerbating pre-existing mental health conditions or straining the mental well-being of people. Patients with co-morbidities are a particularly vulnerable group, as they are more likely to become severely ill from COVID-19 with the added risk of mortality. This pandemic has further disrupted the physical health of patients with co-morbidities, causing disruptions in receiving chronic medications, while affecting their physical well-being due to the delay in receiving adequate healthcare as a result of the disruption of elective surgeries. Mental health plays a critical role in physical health (Ohrnberger, Fichera and Sutton 2017), which leads to the conclusion that fear, depression, anxiety and other mental health impediments derived from the COVID-19 pandemic can significantly constrain physical well-being. Aspects of social and family life have been severely affected by the isolation, with social distancing and working from home, further exacerbating the already complicated situation.

2.2 Taxonomy of coronavirus

When examining the phylogeny or taxonomy of the coronaviruses, the understanding is that they primarily belong to the zoonotic category of pathogens, having three main family groups, namely the Coronaviridae, Arteriviridae and Roniviridae (Berekaa 2021). Coronaviridae has a further classification into two subfamilies, namely Torovirinae and Coronavirinae with the latter having a further categorisation of alpha, beta, gamma and delta coronaviruses (Berekaa 2021). Figures 2.1 illustrates the taxonomic classification of the coronavirus (Pillaiyar, Meenakshisundaram and Manickam 2020). It was believed that the outbreak of COVID-19 infections began in the Hunan seafood market in Wuhan city, China. Upon further investigation, it was found that not all patients infected by COVID-19 had visited the market (Lauer *et al.* 2020; Lotfi, Hamblin and Rezaei 2020). Alternative theories hypothesise that possible infections might have originated from pangolins smuggled from Malaysia into China with intermediary hosts such as turtles and snakes and bats (Lotfi, Hamblin and Rezaei 2020).

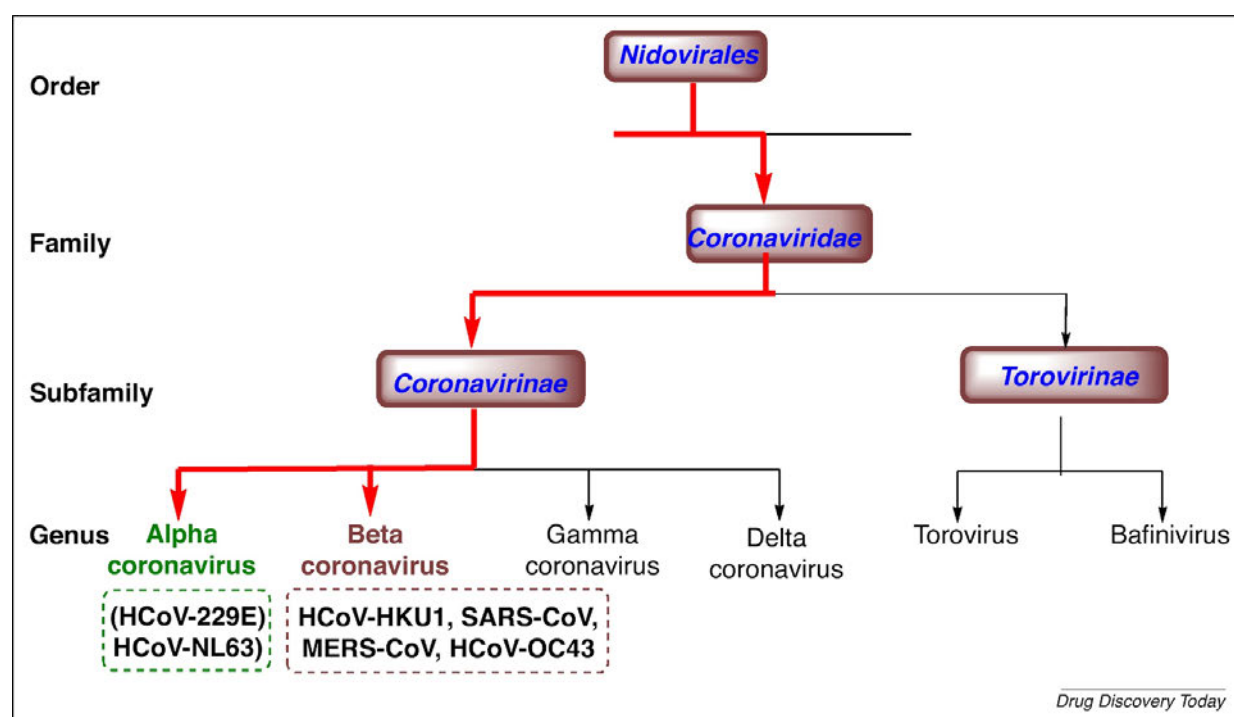


Figure 2.1: Diagram showing the phylogenetic tree of Coronaviruses

The diagram illustrates the phylogenetic tree of coronaviruses. Note: adapted from Pillaiyar, Meenakshisundaram and Manickam (2020)

2.3 Coronavirus structure

The Coronaviridae family of viruses are RNA viruses that have an enveloped positive single-stranded RNA structure (Umakanthan *et al.* 2020). A retrospective analysis of research and literature shows two previous infections or epidemics from the coronaviruses, namely severe acute respiratory syndrome (SARS) as well as the Middle East respiratory syndrome (MERS), while the name given to the current coronavirus disease is called severe acute respiratory syndrome coronavirus disease 2 (SARS)-CoV-2 (Umakanthan *et al.* 2020; Zeidler and Karpinski 2020). The reasoning behind the naming of (SARS)-CoV-2 is due to its RNA genome structure matching severe acute respiratory syndrome (SARS-CoV) by 82% (Zhang *et al.* 2020). In terms of structure, Astuti and Ysrafil (2020: 408) stated that “structurally, SARS-CoV-2 has four main structural proteins, including spike (S) glycoprotein, small envelope (E) glycoprotein, membrane (M) glycoprotein and nucleocapsid (N) protein and several accessory proteins”. Figure 2.2 illustrates the structure of the coronavirus.

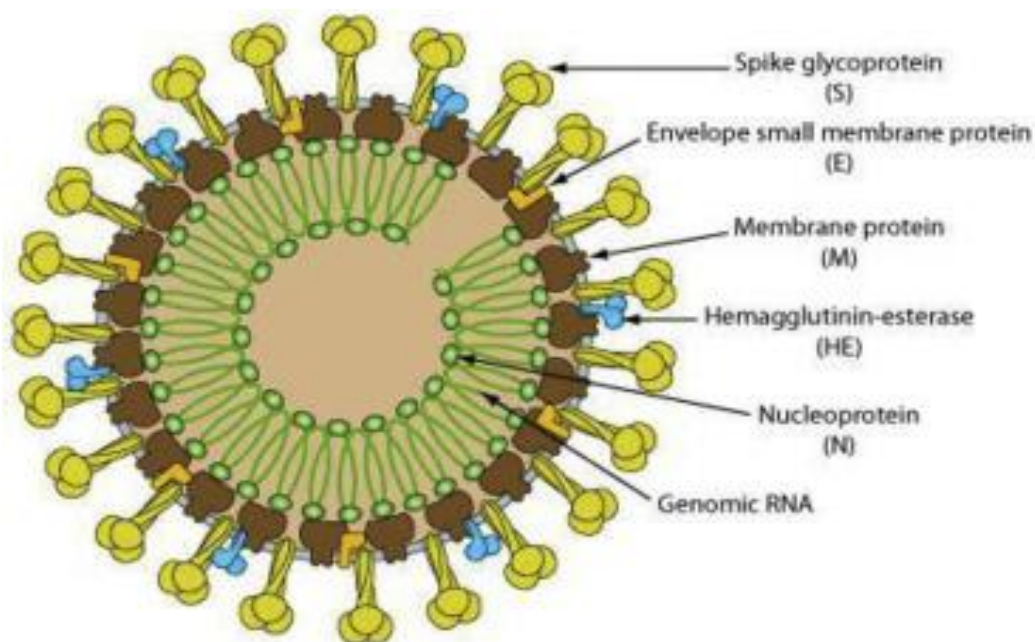


Figure 2.2: Diagrammatic illustration of the genotype and phenotype of coronavirus

The illustration shows SARS-CoV-2, indicating a phenotype of its genetic material that it uses to invade, infect and replicate once inside a host. The Spike (S) glycoprotein, Envelope (E) small membrane protein, Membrane (M) protein, Hemagglutinin-esterase (HE) and the Ribose nucleic acid (RNA). Adapted from Mousavizadeh and Ghasemi (2021).

2.4 Coronavirus variants and mutations

Understanding COVID-19 is an essential part of developing a defence against it. The Centre for Disease Control and Prevention (CDC) outlines a list of variants as follows (Centers for disease control and prevention 2021a):

- Alpha (B.1.1.7 and Q lineages)
- Beta (B.1.351 and descendent lineages)
- Gamma (P.1 and descendent lineages)
- Epsilon (B.1.427 and B.1.429)
- Eta (B.1.525)
- Iota (B.1.526)
- Kappa (B.1.617.1)
- 1.617.3
- Mu (B.1.621, B.1.621.1)
- Zeta (P.2)
- Delta (B.1.617.2 and AY lineages)
- Omicron (B.1.1.529)
- Omicron sub-variant – stealth variant (BA.2) (Christensen *et al.* 2022)

Figure 2.3 provides a visual representation of the emerging variants of concern and variants of interest that were distributed across the world.

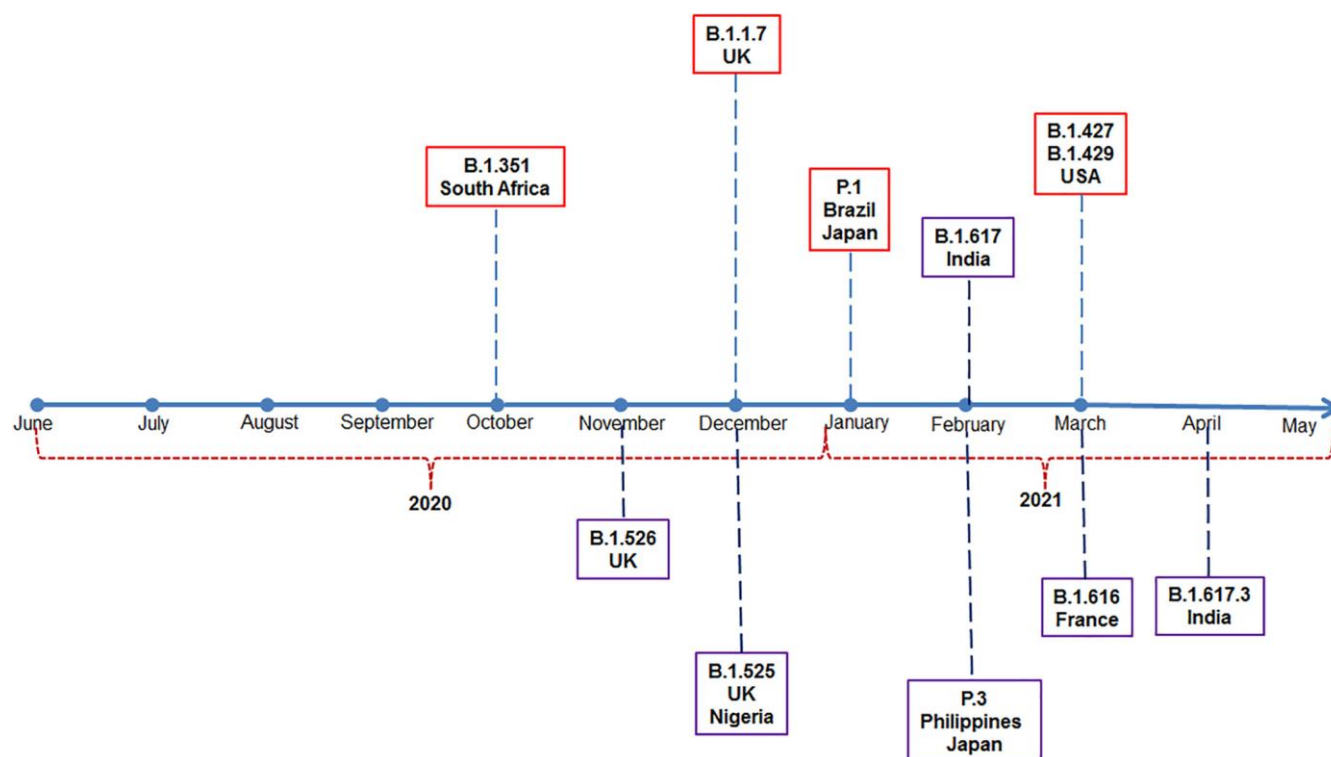


Figure 2.3: Distribution of COVID-19 variants of interest and concern

The diagrammatic illustration indicates the timeline of various emergences of the variants of concern and variants of interest throughout the world. Adapted from Chakraborty, Bhattacharya and Sharma (2021)

From the list provided by the CDC, four variants are classified as variants of concern by the World Health Organization (WHO), which are alpha, beta, gamma and delta (Roy *et al.* 2021). The alpha strain that was detected in the United Kingdom was found to be 30–70% more transmissible and more deadly than the original virus originating in Wuhan, while the beta strain discovered in South Africa in May 2020 was lethal in its pathogenicity due to its ability to cause immune escape (Roy *et al.* 2021). The gamma variant, also a variant of concern, was first identified in Brazil and was soon discovered to cause re-infection (Chakraborty, Bhattacharya and Sharma 2021). July 14 marked the third wave of coronavirus infections as declared by the WHO and the leading variant of concern was the delta variant (Bian *et al.* 2021).

Infection rates from the delta variant were estimated to be 97–100% higher than the original strain of SARS-CoV-2; it also causes immune evasion and breakthrough infection after the full doses of vaccination are completed (Bian *et al.* 2021). The delta variant, first detected in India, has also been associated with higher hospital admissions in comparison to the alpha variant (Allen *et al.* 2021). The latest variant of concern is the omicron variant, which was first identified by South African scientists. The WHO's concern for the omicron variant is due to the vast number of mutations expressed and their similarities to previously discovered variants, which may account for its increased transmissibility and partial immune escape in vaccinated individuals, effectuating re-infection (Torjesen 2021). Immune escape is a highly advanced tool that most viruses, such as SARS-CoV-2, use to evade the immune system by constantly mutating their viral structure, which allows them to either evade innate or acquired immunity or neutralise specifically formed antibodies (Huang and Wang 2021).

2.5 Zoonosis and transmissibility

Coronaviruses are widely known to cause illness in the avian and mammalian groups of animals with major diseases such as gastroenteritis, hemagglutinating encephalomyelitis and murine hepatitis (Umakanthan *et al.* 2020), infections of the upper respiratory tract and colds (Zeidler and Karpinski 2020). COVID-19 was initially believed to have an animal-to-human mode of transmission; however, that remains unclear (Rahman *et al.* 2020). A definitive understanding of the mode of transmission from evidenced-based research shows human-to-human transmission to be the main route of transmission. This form of transmission mainly occurs through direct contact transmission, aerosol transmission, nosocomial transmission and droplet transmission (Rahman *et al.* 2020).

Droplets containing SARS-CoV-2 from sneezing and coughing can travel for a maximum of two metres and can remain suspended for up to three hours (Lotfi, Hamblin and Rezaei 2020). SARS-CoV-2 can spread rapidly from aerosol droplet sprays as well as surfaces (McClymont and Hu 2021). The key approach to limiting the spread of COVID-19 and decreasing infection rates is to promote social distancing by implementing strict lockdowns and quarantine measures (Nouvellet *et al.* 2021). Areas of dense population seem to play a role in the spread of viruses due to increased contact between people as

well as limited capacity to socially isolate. This is a particular concern for South Africa as overcrowding informal settlements continue to pose significant challenges to the country (Shallie and Haffejee 2021). Transmissibility may also be dependent on specific temperatures, as one study suggests that at higher temperatures, the rate of infection significantly decreased. According to Notari (2021) at higher temperatures of 25 °C the SARS-CoV-2 takes 40%-50% longer to replicate in comparison to 5°C. They noted the possibility of bias as poorer countries, in warmer climates could have lower COVID-19 testing. However, by excluding countries with a lower GDP, the conclusions are only slight affected.

2.6 The pathophysiology of SARS-CoV-2

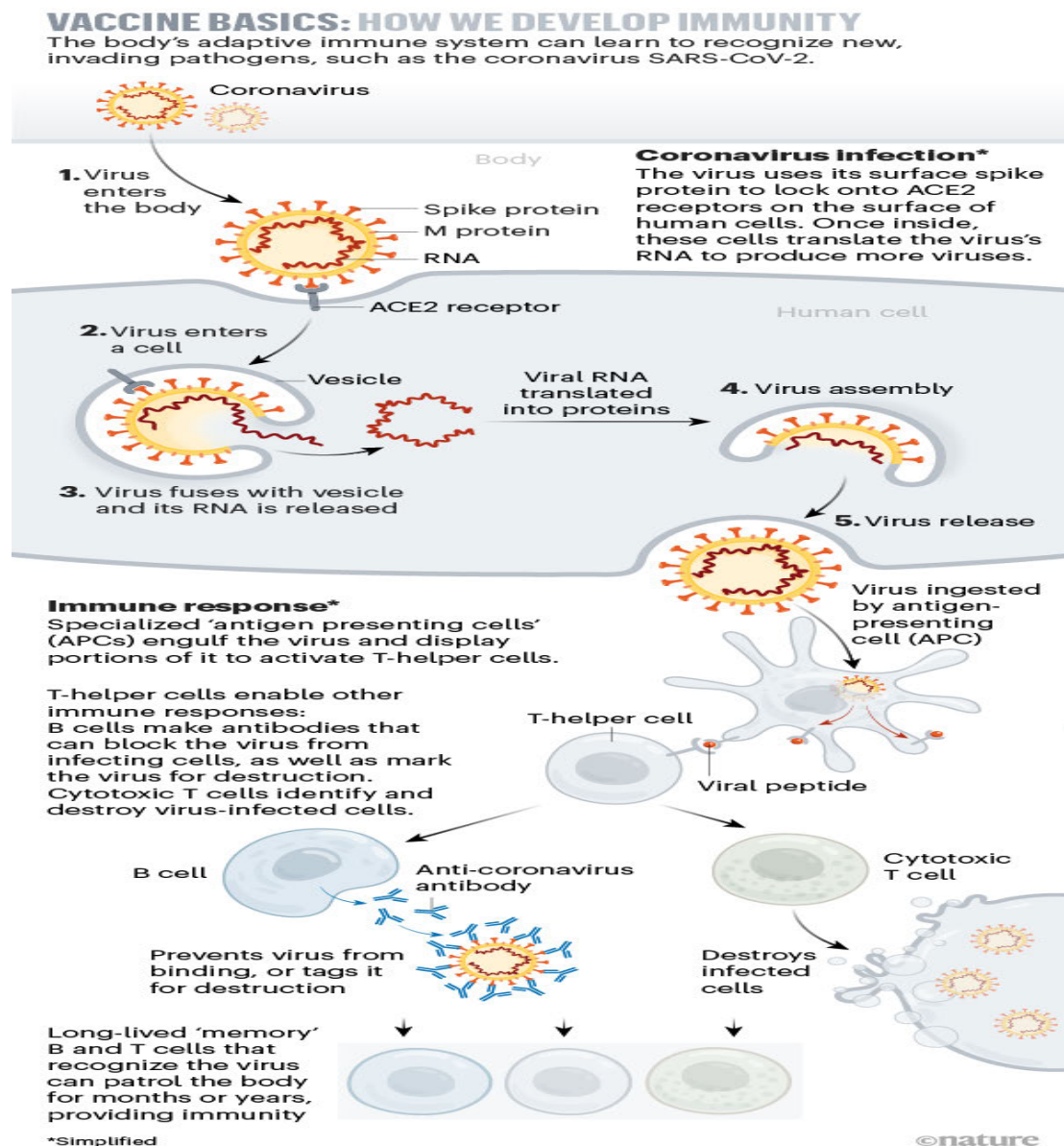


Figure 2.4: Diagrammatic illustration indicating how immunity is achieved

The diagram illustrates the pathophysiological process of the coronavirus invasion, thereafter, binding to the ACE2 receptor via the spike protein. The virus then enters the host cell releasing its genetic material. The immune system responds by ingesting the virus via the antigen presenting cell (APC). The adaptive immune response allows for B-cells and T-cells to then kill virus infected cells. Adapted from Callaway (2020)

Pathophysiology is an important aspect of understanding how diseases work and, therefore, how they affect symptomatology and disease progression. Although SARS-CoV-2 is novel, a great deal has been learned about its structure, infection sites and

symptomatology. There is a general agreement and understanding of the life cycle of a virus and its interaction with a host, which consists of attachment, penetration, biosynthesis, maturation and release (Yuki, Fujiogi and Koutsogiannaki 2020). The pathophysiology of SARS-CoV-2 infection is displayed in Figure 2.4. The mechanism by which SARS-CoV-2 gains entry into the cell is determined by the spike (S) protein, which has to bind to an appropriate receptor; this receptor is currently identified as the angiotensin converting enzyme 2 (ACE2) receptor (Walls *et al.* 2020; Yuki, Fujiogi and Koutsogiannaki 2020). The spike protein plays a critical role in transmissibility and has been found to have a high affinity for the ACE2 receptor, which has been found in large concentrations in many areas of the body, including the lungs, kidneys, small intestines, testes and adipose tissue (Bohn *et al.* 2020).

SARS-CoV-2, together with its high affinity to the ACE2 receptor, indicates high infectivity. The other three protein structures of the virus, namely the nucleocapsid (N), envelope (E) and membrane (M) are essential to the ability of the virus to infect and replicate (Kumar and Al Khodor 2020). SARS-CoV-2 mainly enters through the respiratory tract, where it makes contact with lung epithelial cells, which co-incidentally have one of the highest concentrations of ACE2, thereby often leading to severe lung damage as it enters through the lung epithelium (Chowdhury *et al.* 2020; Yuki, Fujiogi and Koutsogiannaki 2020). Upon infection, the immune system initiates a cascade of reactions to neutralise the foreign organism.

An initial innate immune response by the present macrophages, dendritic cells and epithelial cells in the lung begins the defence until the antigen-presenting cells (APC) initiate a T-cell-mediated response that includes cytotoxic CD8⁺ and helper CD4⁺ T-cells (Oliveira, Medeiros and Gomes 2020; Yuki, Fujiogi and Koutsogiannaki 2020). A critical role of the APC is to transport the SARS-CoV-2 viral antigen to the lymph nodes to present it to the responsible T-cell, which ultimately leads to the formation of antigen-specific antibodies by B-cells under the influence and activation of CD4⁺ T-cells (Yuki, Fujiogi and Koutsogiannaki 2020). Cytotoxic T-cells actively kill and destroy the cells infected by the virus; however, an unfavourable side effect is that it can also lead to lung injury (Yuki, Fujiogi and Koutsogiannaki 2020). Other essential responses to the virus occur as a natural innate immune response, such as cytokine release, including interferons, interleukins and other proinflammatory cytokines. Interferons are essential in the host response as they warn other non-infected cells of an immune evasion (Shah

et al. 2020). The last phase of infection is a memory cell response by B-cells and T-cells, which occurs after the virus is cleared from the body. This response is important as any re-infection can be dealt with as the memory cells would recognise and respond to the virus (Shah *et al.* 2020).

2.7 Symptomatology

Yuki, Fujiogi and Koutsogiannaki (2020: 1-7) tabulated an informative and consolidated classification of symptoms from COVID-19 patients, which indicates how COVID-19 symptoms range from asymptomatic to critical and are classified as follows in Table 2.1:

Table 2.1: Table excerpt showing COVID-19 symptom classification

Note: the data below is adapted from Yuki, Fujiogi and Koutsogiannaki (2020: 1-7)

Asymptomatic	COVID nucleic acid test positive. Without any clinical symptoms and signs and the chest imaging is normal
Mild	Symptoms of acute upper respiratory tract infection (fever, fatigue, myalgia, cough, sore throat, runny nose, sneezing) or digestive symptoms (nausea, vomiting, abdominal pain, diarrhoea)
Moderate	Pneumonia (frequent fever, cough) with no obvious hypoxemia, chest computed tomography with lesions.
Severe	Pneumonia with hypoxemia
Critical	Acute respiratory distress syndrome (ARDS), may have shock, encephalopathy, myocardial injury, heart failure, coagulation dysfunction and acute kidney injury.

The CDC recommends active monitoring of suspected COVID-19 for a period of 14 days with one study by Lauer *et al.* (2020) suggesting that the mean incubation period is around 5.5 days. COVID-19 tends to impact the lower respiratory system and can cause either a mild or severe infection depending on certain risk factors, such as pre-existing conditions (McClymont and Hu 2021).

There is general agreement that a patient infected with the SARS-CoV-2 virus can either be symptomatic or asymptomatic in their presentation of the coronavirus disease. Paleker *et al.* (2020) conducted a South African study to elucidate the transmission of

COVID-19 among asymptomatic carriers of the virus and ascertained that out of 887 COVID-19 positive cases studied, 43.7% were asymptomatic during the first test. Epidemiological evidence indicates the spread of SARS-CoV-2 via asymptomatic carriers (Paleker *et al.* 2020). Although asymptomatic specifies 'no symptoms', COVID-19 can be so ubiquitous and can go undetected while spreading rampantly, which creates multiple issues.

Symptoms that appeared and proved to be common from meta-analysis data were as follows: fever, cough, myalgia, fatigue, expectoration and dyspnoea, headache, dizziness, diarrhoea, nausea and vomiting, while laboratory testing showed evidence of lymphocytopenia, an increase in C-reactive protein, an increase in lactic dehydrogenase and leukocytopenia (Li *et al.* 2020). Symptomatology that can lead to severity of illness borderlines on dyspnoea, which is a shortness of breath that can lead to a hypoxemic state (Berlin, Gulick and Martinez 2020). Berlin, Gulick and Martinez (2020) enumerate a list of symptoms denoting how severe COVID-19 can become and categorically implies the need for intensive care, which comprises progressive respiratory failure, acute respiratory distress syndrome (ARDS), bilateral infiltrates, severe hypoxemia, lung oedema, lymphopenia, thromboembolic complications, central and peripheral nervous system affections, acute cardiac, kidney and liver injury, cardiac arrhythmias, rhabdomyolysis, coagulopathy and shock.

2.8 Laboratory diagnosis

Current testing methods include both molecular and serological testing, with molecular testing involving real-time polymerised chain reaction (RT-PCR) (Tahamtan and Ardebili 2020) and the E gene PCR test. RT-PCR is a vital test used to detect SARS-CoV-2, as it uses nucleic acid detection technology and is often referred to as the 'gold standard' due to its rapid detection, high sensitivity and specificity for the virus (Chau, Strobe and Figg 2020; Tahamtan and Ardebili 2020; Waller *et al.* 2020). RT-PCR requires nasal and throat secretions, while serological testing uses blood samples to detect antibodies that are formed against the coronavirus (Rahman *et al.* 2020). The process of extraction of samples for RT-PCR are by way of nasopharyngeal as well as oropharyngeal samples, which are transported in a viral transport medium, as well as sampling from the lower respiratory tract, sputum, tracheal aspirate, bronchial washings and bronchoalveolar

lavage (Dheda *et al.* 2020). Imaging can be a useful tool in the detection of COVID-19 since it manifests as pneumonia; however, this mostly proves useful in a more advanced stage of the viral infection (Cascella *et al.* 2021). A computed tomography (CT) scan is an imaging tool conducted on patients suspected to be COVID-19 positive, to offer a possible diagnosis based on lung abnormalities; however, the scan's sensitivity proves to be inadequate in comparison to RT-PCR and should only be used as a secondary tool (Waller *et al.* 2020). While diagnosis largely depends on molecular and serological testing to provide accuracy and specificity and is the only way to confirm SARS-CoV-2 infection, there is also a diagnosis based on clinical features, which is fundamental in how healthcare practitioners make informed deductions, which allows them to differentiate COVID-19 from other disease manifestations (Maeda and Nkengasong 2021).

Testing capacity in Africa was unequivocally limited due to the limited number of testing kits available; as evidenced in Nigeria's testing statistics, which reached 70 000 tests at the time, the USA was approaching four million tests (Adepoju 2020). Ethiopia, like Nigeria and other African countries, similarly faces an inadequate healthcare infrastructure, which led to testing facilities not being properly equipped to deal with growing COVID-19 case numbers, which initially led them to send samples to South Africa to be tested (Mulu *et al.* 2021). There is growing concern in sub-Saharan Africa over reduced healthcare facilities as well as trained healthcare staff (Mulu *et al.* 2021). It was predicted that infection by SARS-CoV-2 in Africa would rise significantly due to co-morbidities like tuberculosis, HIV and malaria, as well as overstrained healthcare facilities; however, the number of cases reported appeared less than predicted (Maeda and Nkengasong 2021). Maeda and Nkengasong (2021) suggested that this could possibly be due to several factors, such as limited testing, a younger population, climactic differences, pre-existing immunity, genetic factors, early implementation of public health measures and timely leadership.

2.9 Prognosis

A medical definition of prognosis by Hansebout *et al.* (2009: 328-336) is "the prospect of recovering from injury or disease, or a prediction or forecast of the course and outcome of a medical condition". Prognosis is an important aspect of any disease, as it determines

the progression of the disease. A meta-analysis and systematic review study by Galbadage *et al.* (2020) suggested that being male poses a risk factor for severity in the outcome of the COVID-19 disease process. This is likely due to genetic and biomolecular differences between males and females, as well as lifestyle. Anecdotal evidence suggests that ACE2 is higher in males than in females and could play a role in disease severity (Galbadage *et al.* 2020). Other risk factors include the presence of co-morbidities and heart transplants, particularly due to lowered immune systems (Alizadehsani *et al.* 2021), obesity due to the ability of SARS-CoV-2 to bind to ACE2. ACE2 is commonly known to be present in lung tissue; however, it may also be elevated in adipose tissue, thereby making obesity a major risk factor (Lavie *et al.* 2020). Other common risk factors that can affect the severity and outcome of the pathophysiology include renal disease, hepatic disease and smoking (Noor and Islam 2020). Figliozzi *et al.* (2020) emphasised that hospital mortality was attributed to patients older than 50 years, the presence of co-morbidities such as a history of cardiovascular disease and chronic obstructive pulmonary disease, acute organ injury, lymphocytopenia and an increased level of D-dimer. This is further iterated by Maragakis (2020), who corroborates that age was a risk factor for higher mortality, indicating that the mortality rate in the United States was 80% in persons older than or equal to 65 years, possibly from weakened immunity.

An additional occurrence affecting people who have been infected with SARS-CoV-2 is 'long-COVID', which is a peculiar phenomenon in which symptoms of COVID-19 persist for weeks or even months after the initial disease (Mendelson *et al.* 2020). Raveendran, Jayadevan and Sashidharan (2021) noted that the persistence of symptoms is hypothesised to be due to the recovery period of severe organ damage, cytokine storms, altered immune status, as well as a psychological impact. The authors further stated that

common symptoms in people with "long-COVID" are profound fatigue, breathlessness, cough, chest pain, palpitations, headache, joint pain, myalgia, weakness, insomnia, pins and needles, diarrhoea, rash, hair loss, impaired balance and gait, neurocognitive issues including memory and concentration problems.

Another more severe complication is the effect on the cardiovascular system due to ACE2 receptors on the heart's surface, which can lead to complications of inflammatory myocarditis (Nabavi 2020).

2.10 Treatment

Mild illness is closely observed and treated symptomatically, while severe illness resulting from associated co-morbidities and lower immune systems requires hospitalisation. At the onset of the COVID-19 pandemic, anti-viral drugs, anti-malarial drugs, glucocorticoids and anti-bacterial drugs were employed in treatment strategies, which now show little benefit, while systemic involvement of the disease may require extracorporeal membrane oxygenation, high-flow nasal oxygen and endotracheal intubation (Umakanthan *et al.* 2020). Immunomodulatory drugs were also employed in treatment strategies such as chloroquine (500 mg every 12 hours) and hydroxychloroquine (200 mg every 12 hours) (Cascella *et al.* 2021).

A research paper by Felsenstein *et al.* (2020) provided anecdotal evidence of the various treatment strategies in the treatment of COVID-19:

- (Hydroxy-)Chloroquine is commonly used as an anti-malarial drug as well as an immunomodulatory drug in the treatment of systemic lupus erythematosus (SLE). The drug also exhibits anti-viral properties by affecting the terminal glycosylation of ACE2, therefore preventing SARS-CoV-2 from binding to ACE2, which it uses as a point of infection in the body. However, the risk of mortality was found to be higher with the use of hydroxychloroquine.
- Azithromycin: this drug is known for its anti-microbial and immunomodulatory properties. It is interesting to note that this macrolide drug can be used for non-COVID-19 patients with acute respiratory distress syndrome. However, azithromycin and hydroxychloroquine have been linked to tachyarrhythmias and sudden cardiac death.
- Remdesivir and other nucleoside analogues: remdesivir, favipiravir, geldesivir and ribavirin belong to a group of drugs called nucleoside analogues with remdesivir given much consideration in the treatment of COVID-19. Remdesivir was used efficaciously in patients infected with COVID-19 and had shown effective viral inhibition in cell cultures in *in vitro* studies.
- Protease inhibitors Lopinavir/ritonavir (LPV/r): In a cohort study, the use of LPV/r showed a significant decline in mortality and intubation in patients with severe

acute respiratory distress syndrome (SARS). The use in COVID-19 patients is not significant.

- Recombinant soluble angiotensin-converting enzyme-2 (ACE2) is an important molecule in the body and has been recognised as a point of entry by SARS-CoV-2: therefore, it is suggested that a therapeutic blockade might be necessary to control viral entry; however, studies still need to continue in this area.
- Type 1 interferons: the COVID-19 virus tends to inhibit type 1 interferon activity, thereby increasing infectivity. Recombinant interferons are suggested; however, these have not had any effect on the treatment of symptoms. Felsenstein *et al.* (2020) believe that the time of administration of the recombinant interferons may have been too late to be fully successful.
- Immune modulation: short courses of corticosteroids of low to medium dosage have anecdotally been suggested to work, but further research is needed. Other methods are intravenous immunoglobulins (IVIG), the blockade of cytokines and inhibition of Janus kinases (JAK).

2.10.1 Vaccines

Within a year from the initial identification of SARS-CoV-2, the development of vaccines, a form of prophylaxis, began (Fauci 2021). Companies such as Pfizer, Moderna and AstraZeneca are among the pharmaceutical companies that developed vaccines for public use (Kollewe 2021). The rate of vaccine distribution was a challenge during the early periods of vaccine production, as the number of people in the world far out-weighted production (Plescia, Hannan and Baggett 2022). The distribution of COVID-19 vaccines caused a disparity for Africa and South Africa, as statistics showed that by April 2023, only about 40% of the South African population had received a single dose (Moore and Gray 2023). A study conducted in South Africa by Engelbrecht, Heunis and Kigozi (2022) through an online survey with 10 466 respondents found vaccine hesitancy to be a common concern. Participants expressed concerns about vaccine development, government distrust, and potential side-effects.

Brunson (2021) defined a vaccine as a “suspension of weakened, killed, or fragmented microorganisms or toxins or other biological preparation, such as those consisting of antibodies, lymphocytes, or messenger RNA (mRNA), that is administered primarily

to prevent disease". Vaccines play an important role in immunity by conferring active immunity against pathogens that are often harmful to the body. This is done by stimulating B-lymphocytes, a type of protective white blood cell, to produce antibodies against harmful organisms (Brunson 2021). Herd immunity plays an important role in the community, as it protects people from becoming infected by an organism that is considered pathogenic. The more people who are immune, the less likely a pathogenic organism has the ability to spread, which is why vaccination plays an important role in the community (Clemente-Suárez *et al.* 2020). The vaccines currently approved by the South African Health Products Regulatory Authority (SAHPRA) are AstraZeneca, Pfizer and the Johnson & Johnson vaccines (South African Health Products Regulatory Authority 2021).

Different types of COVID-19 vaccines were utilised during the pandemic with each designed to achieve immunity against SARS-CoV-2. Messenger RNA (mRNA) vaccines have been used by two pharmaceutical companies, namely Pfizer- BioNTech and Moderna, by genetically engineering mRNA containing the code for the spike (S) glycoprotein, which is encapsulated in lipid nanoparticles (Verbeke *et al.* 2021) and gives important directives to the human cells to produce the protein that is located on the surface of SARS-CoV-2 (Mayo clinic 2021). When the vaccine is administered, the body's cells begin the process of forming S proteins and thereafter presenting them on the cell's surface, which triggers the immune system's B-cells to produce appropriate antibodies specific to the S protein, of the coronavirus, thereby achieving immunity (Mayo clinic 2021).

The viral vector vaccine was another important type of vaccine being used to achieve immunity by Janssen, Johnson & Johnson and AstraZeneca (Mayo clinic 2021). This vaccine used a 'virus vector' that is different from SARS-CoV-2 and was used to carry the genetically coded material of the coronavirus to stimulate an immune response within the human body cells, which causes the cells to produce the S protein and thereafter the resultant formation of antibodies specific to SARS-CoV-2 (Centers for disease control and prevention 2021b). Protein subunit-type vaccines were also considered for use as vaccines in which fragmented portions of the virus, specifically the S protein were used to facilitate and trigger an immune response (Callaway 2020). A common manufacturing process of vaccines was conducted using the actual virus in a weakened or inactive form, like the one being studied by Sinovac Biotech. The weakening of a virus is

accomplished by sending the virus through animal or human cells, which results in mutations of the virus and thereby rendering it weakened, while inactivating the virus occurs by mixing the virus in formaldehyde or exposing it to heat (Callaway 2020)

2.11 COVID-19 and co-morbidities

Co-morbidities are the presence of two or more diseases that are found in an individual at a given time. It is well established that COVID-19 and co-morbidities are interlinked and that co-morbidities may lead to the severity of the outcome of COVID-19 (Dawes 2010; Ye *et al.* 2020). Patients with many co-morbid diseases may contribute to the elevated mortality rate (Moyo *et al.* 2020; Noor and Islam 2020). The reason behind the risk of severity or mortality is due to its effect on the immune system, which may affect how the body reacts to COVID-19 (Callender *et al.* 2020). Upon infection by SARS-CoV-2, a cascade of innate immune responses is triggered, involving many cytokines and key leukocytes, also known as white blood cells (WBC) like neutrophils, basophils, lymphocytes and macrophages (Yazdanpanah, Hamblin and Rezaei 2020). Anjorin *et al.* (2021) conducted research on the exploration of the effect of co-infection and COVID-19 and stated that

the debate around the COVID-19 response in Africa has mostly focussed on effects and implications of public health measures, in light of the socio-economic peculiarities of the continent. However, there has been limited exploration of the impact of differences in epidemiology of key co-morbidities and related healthcare factors, on the course and parameters of the pandemic.

According to several studies and meta-analyses, the most prevalent physical co-morbidities that can affect the prognosis of COVID-19 are hypertension, diabetes, cerebrovascular disease, cancer, chronic obstructive pulmonary disease and chronic kidney disease (Singh and Misra 2020; Zádori *et al.* 2020; Egede *et al.* 2021). In South Africa, co-morbidities like HIV and TB increased the death rate by 2.75 and 2.58 respectively (Singh and Misra 2020). South Africa's challenges with HIV and TB pose a greater risk of COVID-19 infections because it has the fourth highest levels of TB infections and a high prevalence of HIV globally (Schlüter *et al.* 2021).

2.11.1 Communicable and non-communicable diseases/ co-morbidities

When identifying common conditions affecting the South African population, it is of vital importance to differentiate between communicable and chronic non-communicable diseases (NCDs). Chronic NCDs are diseases that are non-infectious and therefore are not transmitted from person to person. These diseases are characteristically long-standing and exhibit a slow progression (Puoane *et al.* 2012). According to the WHO, as cited by Mutyambizi *et al.* (2019), Africa faces an uncertain future as NCDs are on the rise and could become the leading cause of death by 2030, thereby surpassing all other causes of death. Puoane *et al.* (2012) categorically identified a wide array of risk factors that particularly affects the South African population and may lead to NCDs. These risk factors are listed in Table 2.2. In previous years, NCDs primarily affected those from higher-income countries. However, a new precedent sees lower income or developing countries being affected as well with an impact on the healthcare system (Chetty and Ross 2016).

Table 2.2: Risk factors that may lead to chronic non-communicable diseases

Note: The tabulated data is adapted from Puoane *et al.* (2012: 115-126)

Behavioural determinants	Social determinants	Structural, environmental determinants	Cultural determinants
• Tobacco use • Obesity • Physical inactivity • Alcohol misuse	• Employment • Poverty • Education • Accommodation • Socio-economic status	• Food environment • Marketing of unhealthy products and behaviours	• Sedentary lifestyle of youth • Being overweight

Communicable diseases are those diseases that spread from one person to another and are regarded as infectious (Modjadji 2021). Hammer, Brainard and Hunter (2018: 1-10) investigated the risk factors of communicable diseases by way of a systematic review and consolidated current evidence, thereby ascertaining the following risk factors listed in Table 2.3 below to be common causes for the spread of communicable disease.

Table 2.3: Risk factors of communicable/ infectious disease

Note: The data tabulated below is adapted from Hammer, Brainard and Hunter (2018: 1-10)

Hygiene & sanitation	The lack of adequate water and soap to ensure proper sanitation is usually the biggest concern for the spread of infection. Often, a contributing factor to improper hygiene is the lack of ablution facilities as well as safe and clean drinking water.
Overcrowding	Overcrowding is a common problem in many rural places, which allows for a rapid spread of communicable disease due to the close contact of people.
Population displacement	Population displacement is associated with factors such as poor hygiene and sanitation, as well as overcrowding.
Nutrition & Insecurity	A lack of nutrition often leads to complications as people are deprived of proper food to ensure adequate immunity.
Infrastructure, health services & economy	Poverty and poor health care systems often lead to an exacerbation of infectious disease, which is made worse by the lack of accessibility to health care facilities.
Humanitarian response	Many people, especially in rural communities and conflict zones, rely on humanitarian aid. If this form of support becomes insufficient, a further acceleration of infectious disease can occur.
Environment	The risk of communicable diseases from the environment is a common occurrence and is largely dependent on the type of weather and endemic diseases.

2.11.2 Common co-morbidities affecting the South African population

Co-morbidities are a growing concern in South Africa. According to Statista (2021), the most common co-morbidities in South Africa are heart attacks/myocardial infarctions, tuberculosis, stroke, cancer, high cholesterol, hypertension, HIV/ AIDS, diabetes, asthma and obesity.

2.11.3 The impact of co-morbidities on the South African population

The impact of co-morbidities is described in depth to demonstrate the burden of disease among people.

Hypertension

Hypertension is a disease that contributes to cardiovascular disease (CVD) and is now becoming a common condition in South Africa (Malaza *et al.* 2012). According to Porter (2011: 2065), hypertension is defined as having a resting systolic blood pressure ≥ 140 mmHg and a resting diastolic blood pressure of ≥ 90 mmHg with two specific types known as primary hypertension (no specific cause) and secondary hypertension (identifiable cause). Statistics indicate that females have a higher prevalence of hypertension than males with 46.0% and 44.0% respectively in South Africa, while hypertension is one of the main reasons for deaths in the adult population (Kandala *et al.* 2021). Malaza *et al.* (2012) indicate a correlation between cardiovascular disease, hypertension and obesity while emphasising that South Africa, together with its HIV epidemic, has a great burden of hypertension and obesity, possibly due to many South African cultures seeing obese/overweight woman as attractive, therefore exacerbating health concerns. A study conducted by Kandala *et al.* (2021) emphasised that South Africa has a major hypertension problem, which is a cause for concern and is attributed to the many risk factors that interplay in the contribution to hypertension and CVD, namely age and lifestyle and dietary regimens. Kwazulu-Natal has a significantly higher prevalence of hypertension possibly owing to the high prevalence of obesity (Kandala *et al.* 2021).

HIV/ AIDS

Porter (2011: 1438) states that “human immunodeficiency virus (HIV) infection results from 1 of 2 similar retroviruses (HIV-1 and HIV-2) that destroy CD4+ lymphocytes and impair cell-mediated immunity, increasing risk of certain infections and cancers”. South Africa is known to have the largest number of HIV positive people in the world with 7.7 million (Nuh 2021) with a national prevalence of 20.6% among individuals aged between 15 and 49 years (Kharsany *et al.* 2020). Risk factors for HIV infection are generally understood to be unsafe sex, which allows for the exchange of bodily fluids; in addition, infection can occur through blood and breastfeeding (Porter 2011).

Diabetes Mellitus

Porter (2011: 866) defined diabetes mellitus as “impaired insulin secretion and variable degrees of peripheral insulin resistance leading to hyperglycaemia”. The South African statistics estimate that in 2015, as many as 2.3 million individuals had diabetes with 1.396 million remaining undiagnosed, possibly due to lower socio-economic circumstances (Mutiyambizi *et al.* 2019). These are thought to play a role in the development of diabetes mellitus, as individuals from lower-income backgrounds who are less educated may not seek help (Bailey *et al.* 2016). Mutiyambizi *et al.* (2019) list the risk factors for diabetes as race, age, lifestyle and socio-economic status. Lifestyle is a cause for concern, as inactivity, unhealthy food, smoking and alcohol consumption can increase the likelihood of getting diabetes. The weight and age of a person are highly correlated with the risk of developing diabetes mellitus. An increased weight and older age groups have a higher risk of developing diabetes mellitus (Bailey *et al.* 2016).

Asthma

Asthma affects the global population and is defined by Longmore *et al.* (2014: 172) as “recurrent episodes of dyspnoea, cough and wheeze caused by reversible airway obstruction”. The prevalence of asthma is considerably high, as South Africa is ranked 25th in the world, while also being ranked 5th for mortality due to asthma (The global asthma network 2018). Asthma imposes a burden on the healthcare system because of the high prevalence of patients; furthermore, it causes societal burdens by affecting work production. Asthma also affects families, particularly those with paediatric asthma (Lion-Cachet, Musonda and Omole 2021).

Dyslipidaemia

Defined by Porter (2011: 890) as an “elevation of plasma cholesterol, triglycerides (TGs), or both, or a low high-density lipoprotein level that contributes to the development of atherosclerosis.” There is evidence that indicates dyslipidaemia to be a major risk factor for cardiovascular disease (Longmore *et al.* 2014). The main reason for CVD risk is the formation of an atherosclerotic plaque that builds up in arterial walls, leading to blood flow blockages, which ultimately lead to myocardial infarctions and cerebrovascular diseases such as stroke (The heart and stroke foundation South Africa 2020). In South

Africa, the prevalence of dyslipidaemia is 14–69% (Reiger *et al.* 2017). The data clearly suggests a burden of disease on healthcare and the rate of mortality, as CVD is on the rise and often presents with an increase in finances for both the person and the healthcare system (Reiger *et al.* 2017).

Myocardial infarction and cerebrovascular accident (stroke)

Myocardial infarction falls under the acute coronary syndromes and is described, according to Porter (2011: 2099), as “acute obstruction from a coronary artery...when an acute thrombus forms in an atherosclerotic coronary artery”. Longmore *et al.* (2014: 474) stated that a stroke is an “ischaemic infarction or bleeding into part of the brain”. The main causes of a stroke, according to Longmore *et al.* (2014), are thrombosis and artherothromboembolism. According to The Heart and Stroke Foundation of South Africa, five people have myocardial infarctions and ten people have cerebrovascular accidents every hour in South Africa (Byrne, Eksteen and Crickmore 2016), yet this is preventable occurrence. Chetty and Ross (2016) identify the following statistics for annual mortality of ischaemic heart disease in the South African population:

- Indian population of 206.9 per 100 000
- 162.7 per 100 000 in the white population
- African/Black population was 13.1 per 100 000.

Tuberculosis

Porter (2011: 1302) describes tuberculosis (TB) as a “chronic, progressive infection with a period of latency following initial infection... it occurs mainly in the lungs”. According to Walt *et al.* (2018), South Africa has a high burden of TB, which accounts for 3% of the estimated global cases with an estimated 301 000 TB cases per year in South Africa (Naidoo and Naidoo 2021). TB and HIV co-infection as well as multi-drug-resistant TB (MDR-TB) have resulted in a burden on the South African healthcare system, which is attributed to the socio-economic circumstances of people as well as individuals who do not get help and remain undiagnosed (Walt *et al.* 2018). MDR-TB is a considerably challenging form of TB that has resulted from poor drug quality, inadequate hygiene and pre-mature treatment. While this can be treated with a second line of treatment, there is

also an extremely drug resistant TB (XDR-TB). This form of TB has no specific treatment (Muthukrishnan 2021).

Cancer

Martin (2015: 115) defines cancer as “any malignant tumour, including carcinoma, lymphoma, leukaemia and sarcoma. It arises from abnormal, purposeless and uncontrolled division of cells that then invade and destroy the surrounding tissues”. Risk factors are consequentially due to infections, radiation, drugs and related chemical substances, as well as dietary substances (Porter 2011) with obesity and tobacco also playing a role (Department of Health 2022). According to the World Health Organisation (2020), from the statistics in the year 2018, the number of cancer patients was 107 467 and the number of deaths was 57 373 with the most common types of cancer attributed to breast, cervix, uteri, colorectum, liver, lung, non-Hodgkin lymphoma, oesophagus, prostate, thyroid and vulva. While cancer is a burden on health, it also impacts both the healthcare system as well as the socio-economic development of both the individuals affected and the public health sector (Department of Health 2022).

2.11.4 The impact of COVID-19 on co-morbidities

The literature suggested a substantial connection between co-morbidities and SARS-CoV-2 disease progression, which is an exacerbation of COVID-19 pathophysiology and prognosis due to the presence of co-morbidities (Ye *et al.* 2020; Zádori *et al.* 2020; Anjorin *et al.* 2021; Egede *et al.* 2021). Zádori *et al.* (2020) and Egede *et al.* (2021) highlighted that co-morbidities like cerebrovascular disease, chronic obstructive pulmonary disease, cardiovascular disease, hypertension, diabetes mellitus and malignancy could be responsible for severe COVID-19 disease progression. COVID-19 affects multiple systems and it is therefore important to understand what the impact of COVID-19 is on the organ systems within the human body.

Cardiovascular disease (CVD)

COVID-19 affects the cardiovascular system with immense severity, which can often lead to rapid disease progression and subsequent mortality, sometimes exacerbating

current conditions and other times causing new cardiovascular conditions to occur (Ogah *et al.* 2021). This is evidenced by Clerkin *et al.* (2020), who identify possible mechanisms in which myocardial involvement and injury can occur, which include an increased production of cytokines (cytokine storm) due to an erroneous reaction from T-helper cells. A cytokine storm occurs during infections and is triggered by a massive release of different chemical cytokines produced by the immune cells, namely interleukin-6, tumour necrosis factor and interleukin-1 causing multiple organs to get damaged (Mai, Del Pinto and Ferri 2020; Nishiga *et al.* 2020).

According to Ogah *et al.* (2021) the cardiovascular system is involved in a myriad of ways during COVID-19 infection. There is damage to the myocardium of the heart, systemic inflammation, plaque rupture and clotting within the coronary arteries. Furthermore, the supply and demand in the myocardial oxygen ratio are altered and disturbances in electrolyte balance affect heart function and cause a decrease in oxygen supply to tissues. Around 12% of patients without pre-existing cardiac disorders experienced heart damage after the COVID-19 infection with pathognomonic elevated cardiac troponin. Cardiac troponin is a protein released during heart muscle damage (Ramani and Naik 2021).

In an investigative analysis in Wuhan, China, Mai, Del Pinto and Ferri (2020) found that the rate of mortality was higher in patients with CVD and high blood pressure. Another report by the same authors emphasised the effect of co-morbidities on COVID-19 with hypertension and heart disease being the most frequent of the disease conditions to enhance the severity of COVID-19. Hypertension, specifically, was noted to increase the need for intensive care (*ibid.*). These findings make CVDs a risk for increased morbidity from SARS-CoV-2 infection (Nishiga *et al.* 2020). Approximately 215 people succumb to myocardial infarctions and cerebrovascular accidents per day in South Africa, which is thought to be further worsened by the SARS-CoV-2 pandemic (Jankelow *et al.* 2020). Pre-existing cardiac conditions is confirmed to be heightened following SARS-CoV-2 infection. As a result of increased pressure on the heart, it needs to pump at a faster rate and hypoxic states and thromboembolic conditions are more likely to occur (Srivastava 2020).

Apart from exacerbating existing cardiovascular conditions, COVID-19 potentially triggers other cardiac manifestations such as damage to the cardiac muscle cells, arrhythmias, thrombus-type conditions, myocarditis and acute coronary syndromes in

which there is reduced blood flow to the heart (Nishiga *et al.* 2020). Angiotensin-converting enzyme 2 (ACE2) is known to play a role in the SARS-CoV-2 attachment and invasion of cells in different areas of the body, such as the lung, heart and intestines. Angiotensin-converting enzyme 1 (ACE1) converts angiotensin 1 to angiotensin II; a chemical responsible for increasing blood pressure, ACE2 has an opposite role; it converts angiotensin II back to the former angiotensin 1 (Ferrari, Di Pasquale and Rapezzi 2020; Jankelow *et al.* 2020). Angiotensin II receptor blockers (ARBs), a type of drug, cause an increase in plasma levels of angiotensin II, thereby increasing the available ACE2, which ultimately results in increased infection and possibly severity; however, this needs further investigation and stopping ARBs is not advised (Ferrari, Di Pasquale and Rapezzi 2020; Gori, Lelieveld and Münzel 2020; Jankelow *et al.* 2020; Tadic *et al.* 2020b).

Another major aspect of healthcare that had been affected was the postponement of elective surgeries during periods of lockdown or during times of added stress on hospitals due to the excessively high number of admissions from COVID-19 patients (Gori, Lelieveld and Münzel 2020). Additionally, an indirect complication is that patients with existing heart conditions may not be eager to visit their healthcare provider, either in the private or public sector, due to the fear of contracting COVID-19 and further compromising their health (Jankelow *et al.* 2020).

Respiratory diseases

The respiratory system consists of the lungs and its airways, namely the trachea, bronchi and bronchioles with air sacs known as alveoli that contribute to gaseous exchange and allow for breathing as well as oxygen intake and removal of carbon dioxide (Ralston *et al.* 2018). The SARS-CoV-2 main route of entry into the body is through the respiratory system due to inhalation of the virus and thereafter viral invasion by binding to ACE2 (Brosnahan *et al.* 2020; Torres-Castro *et al.* 2021). The main clinical manifestations of the disease are also present in the lungs with shortness of breath and an eventual hypoxic state that progressively deteriorates into acute respiratory distress syndrome (ARDS) (Berlin, Gulick and Martinez 2020). According to Brosnahan *et al.* (2020) COVID-19 infection can lead to severe lung injury either directly through the viral infection or indirectly by the immune system of the host as well as mechanical ventilation.

Examples of lung injury can be seen on computed tomography (CT) with ground-glass opacities, focal consolidations and abnormalities of pulmonary vascular perfusion, alveolar damage and pulmonary embolism (Brosnahan *et al.* 2020).

Torres-Castro *et al.* (2021: 328) further iterated that the COVID-19 infection can lead to eventual chronic conditions such as “lung fibrosis and pulmonary hypertension”. The COVID-19 outcome was usually mild in patients with asthma, unless the asthma was uncontrolled and the lung presented with an injury (Zyl-Smit *et al.* 2020). On the other hand, patients who had pre-existing chronic obstructive pulmonary disease (COPD) were reported to have more severe and unfavourable outcomes (Zyl-Smit *et al.* 2020).

In a study by Lee *et al.* (2021a) conducted in South Korea, two groups of non-COPD (4469) and COPD patients (141) with COVID-19 were compared to assess the severity of COVID-19; the results showed that patients who were diagnosed with pre-existing COPD and had COVID-19 required ventilation and intensive care. South African statistics showed that in 2019, 301 000 people had been diagnosed with TB with 60% of that population having HIV as well (Moyo *et al.* 2020). Loveday *et al.* (2020: 1162) states that “recent data from the Western Cape Province show that people with active TB were over 2.5 times more likely to die of COVID-19 than people without TB... and that people with a previous history of TB had a slightly increased risk of death from COVID-19”, owing to possible lung injury and decreased lung capacity.

Gastroenterological diseases

The gastroenterological system consists of the oesophagus, stomach and small and large intestine and is responsible for the release of many substances that aid in digestion as well as the absorption of essential nutrients to maintain a healthy body (Ralston *et al.* 2018). COVID-19 is known to largely affect the human digestive system, producing symptoms of diarrhoea, nausea, intestinal-related fever and involvement of the liver. The presence of SARS-CoV-2 was also found in stool samples (Hunt *et al.* 2021). Inflammatory bowel disease (IBD) can be affected by the COVID-19 disease process due to the presence of ACE2 in the gut lining. While not being a risk factor for COVID-19 alone, advanced age and colonic complications are areas of concern (Hunt *et al.* 2021). There is also a correlation between liver injury and COVID-19 infection; however, this is more prominent in severe cases and is considered part of the viral invasion

process (Zhang, Shi and Wang 2020). A study conducted by Lippi *et al.* (2021) suggested that, as a co-morbidity, chronic liver disease did not increase the severity of COVID-19 nor did it increase the risk of mortality.

The pancreas is responsible for releasing digestive enzymes (Ralston *et al.* 2018) as well as insulin, which is responsible for maintaining blood glucose levels (Ralston *et al.* 2018); an imbalance of insulin can result in diabetes mellitus. The global prevalence of diabetes mellitus is 9.3% and is a risk factor for disease severity and death in COVID-19 (Pranata *et al.* 2021). Pranata *et al.* (2021) give reasons why diabetes plays such an important role in COVID-19 severity, namely a decreased response from the immune system owing to diminished T-cell performance and reduced activity of phagocytic cells, an increased level of ACE2 and higher glucose levels, which favour viral replication abilities.

In South Africa, there is significant cause for concern, as more than four million people are afflicted with diabetes, which is attributed to an elevation of obesity (Erzse *et al.* 2020). The pandemic indirectly affects diabetes treatment as individuals may fear going to healthcare facilities due to fear of contamination, restrictions on travel and financial burdens, all of which can play a role in further deteriorating patients' well-being (Erzse *et al.* 2020). While obesity drives the progression of diabetes, it is also an important risk factor for COVID-19 infection as it may impact lung function (Dietz and Santos-Burgoa 2020). Erzse *et al.* (2020) highlighted that during restrictions and lockdowns, food prices tend to rise, which has a negative effect on nutrition and can drastically affect weight gain, obesity and diabetes. Furthermore, a lack of physical activity during this period adds to this.

Kidney diseases

The kidneys play an important role in the body by excreting unwanted substances and regulating vital processes like blood pressure (Ralston *et al.* 2018). During SARS-CoV-2 infection, acute kidney injury can occur due to various processes occurring in the body. Hypoxia in the lungs, which results in kidney hypoxia due to decreased oxygen supply, cytokine storm, sepsis, direct injury as a result of the presence of ACE2 and viral entry and thrombotic conditions can result in acute kidney failure (Hassanein *et al.* 2020).

The presence of chronic kidney disease as a co-morbidity can exacerbate the severity of COVID-19, (Hassanein *et al.* 2020), potentially leading to more severe outcomes. Another major concern about the impact of COVID-19 is on individuals with end-stage kidney disease who are on renal dialysis. A higher risk of COVID-19 infection and severity can occur in these patients due to their multiple comorbidities; therefore, measures of COVID-19 screening should be implemented in dialysis units to ensure patient safety (Hassanein *et al.* 2020).

HIV/AIDS

HIV-infected patients are one of the most vulnerable groups due to their lowered immune system, particularly patients who do not adhere to the anti-retroviral medication (ARV) (Chenneville *et al.* 2020). A major complication affecting individuals is the interruption of treatment strategies due to COVID-19 restrictions, as well as patients being exposed to contamination from COVID-19 when attending appointments (Chenneville *et al.* 2020). South Africa ranks among the leading countries with a significant HIV burden with around 7.7 million cases out of a global case population of 40 million (Prabhu, Poongulali and Kumarasamy 2020; Nuh 2021). Additionally, Kwazulu-Natal has an estimated 1.7 million HIV-infected individuals (Dorward *et al.* 2021). The Western Cape Department of Health in collaboration with the National Institute for Communicable Diseases (2020) has identified aspects of COVID-19 and HIV co-infection that may reduce the severity of COVID-19, such as dysfunctional immunity in HIV-infected persons, as well as ARVs such as tenofovir that act against coronaviruses. This offers some benefit to HIV infected individuals.

Cancer/Malignancy diseases

In Africa, there are over one million cancer cases annually with a mortality rate of 700 000, which clearly indicates the burden of disease, which has been amplified by COVID-19 (Grossheim *et al.* 2021). Patients who have cancer are often immuno-compromised, which can further exacerbate the risk of contracting COVID-19 as well as determine disease severity (Al-Quteimat and Amer 2020; Ramani and Naik 2021). Apart from the condition of the immune system, disease progression can deteriorate due to cancer

treatments like chemotherapy, radiotherapy and surgical procedures (Al-Quteimat and Amer 2020; Ramani and Naik 2021).

The mortality of patients with cancer and COVID-19 co-infection is much higher than in patients without malignancy (Grossheim *et al.* 2021). Patients who have cancer have a higher chance of thromboembolism and other bleeding-related occurrences, which is exacerbated by COVID-19. A study found that 25% of patients with cancer being treated for COVID-19 in intensive care, developed venous thromboembolism (Ramani and Naik 2021). Lockdowns and restrictions often lead to unintended disruptions of services, including treatment for people with cancer. This is particularly common in developing countries. Another concern is the disruption of cancer screening services, which can result in patients not receiving their diagnoses on time, further affecting the initiation of treatment (Nnaji and Moodley 2021; van Wyk *et al.* 2021).

The physical impact of COVID-19 on the well-being of the body

During periods of lockdown, physical activity is reduced considerably, which ultimately leads to sedentary behaviour. This lack of physical activity can hamper several bodily functions and lead to a reduced physical and mental health level while increasing anxiety and depression (Stockwell *et al.* 2021). Indirectly, the lockdown imposed by many countries could have negative consequences due to the metabolic effects on the body from overeating and eventual weight gain, which could be further compounded by the lack of physical activity (Jimenez *et al.* 2021). COVID-19 lockdowns led to many resorting to snacking on unhealthy foods; this, combined with the reduced levels of physical activity, could lead to weight gain (Deschasaux-Tanguy *et al.* 2021).

Further, research has shown that sleep irregularities, including insomnia, can occur due to neurological disturbances provoked by the SARS-CoV-2 invasion of the brain (Cespuglio *et al.* 2021). Moreover, research showed that there is an association between psychological distress and sleep disturbances. A systematic review found a connection between sleep disorders and the mental symptoms of anxiety and depression during the pandemic. This is attributable to the fears people experienced as well as altered sleep behaviour due to the COVID-19 lockdown (Alimoradi *et al.* 2021).

2.12 The mental impact of COVID-19

The World Health Organization (WHO), as cited by Khan *et al.* (2020a: 1), defined mental health as

the state of wellbeing in which individuals realise their capabilities to combat normal life stressors and work competencies in contributing to the belonged community, which is underpinned by six psychological elements comprising (i) self-acceptance, (ii) meaning in life, (iii) autonomy, (iv) healthy relationships with others, (v) environmental mastery and (vi) personal growth.

These basic facets of mental health are being affected globally by the COVID-19 pandemic. COVID-19 may primarily have physical manifestations as it is a disease of the respiratory system, albeit numerous writers concur regarding its effects on the emotional and behavioural well-being of an individual, which can conclusively affect mental status (Gupta and Pandi-Perumal 2021). Mukhtar (2020: 1-2) lists a variety of mental health impacts from COVID-19, namely “psychological distress, mental health issues, grief, shame, helplessness, hopelessness, posttraumatic symptoms, substance abuse, panic attacks, stress, anxiety, depression, loneliness, ambivalence, fear, anger, stigma and worry towards socioeconomic status”.

Current research approximates that prevalence and incidence rates of mental health are significantly higher in South Africa than in other countries with statistical evidence showing that one in three South Africans may be diagnosed with mental illness, which accounts for 30.3% of the population (Kim, Nyengera and Mendenhall 2020). A study conducted in Soweto found evidence of anxiety, stress and depression in individuals relating to lockdown restrictions, unemployment, poverty and personal and family well-being. While physical ailments demonstrate a heightened risk of severity in the pathophysiology and prognosis of COVID-19, comparably, mental illness can significantly impact COVID-19, specifically in persons with established mental health conditions (Egede *et al.* 2021; Simon *et al.* 2021). One of the contributing factors to poor mental health is residing in low- to middle-income communities characterised by challenges such as the inability to properly isolate, high rates of unemployment and overcrowding (Kola *et al.* 2021). Unemployment can be linked to high levels of depression and have negative impacts on mental health (Posel, Oyenu and

Kollamparambil 2021). There is a paucity of studies on the risk of developing mental disorders after SARS-CoV-2 infection. However, one study by Xie, Xu and Al-Aly (2022), who compared COVID-19-infected (post-infected) and non-infected groups, suggests that a risk of mental health diseases such as anxiety, depression, stress and substance abuse may occur as a result of the SARS-CoV-2 infection.

Nguse and Wassenaar (2021) cited data from the South African College of Applied Psychology, which reported that anxiety and depression can affect one in six South Africans with 60% of people with HIV having a form of mental disorder, a prevalence of 60% of depression among pregnant women and post-traumatic stress disorder affecting around 60% of the South African population. In view of the COVID-19 pandemic, there is a clear understanding of how anxiety, fear and worry can be heightened. On 26 March 2020, the South African government implemented a strict lockdown to mitigate the spread of the virus and to implement strategies for equipping hospitals and healthcare workers (De Man *et al.* 2022). According to De Man *et al.* (2022), mental symptoms of anxiety, depression and stress have been reportedly higher during the pandemic.

The lockdown has had major implications for the livelihoods and daily lives of people, which have caused changes to travel, work-from-home situations and strict bans on large gatherings (Lee *et al.* 2021b). Additionally, Lentoer and Maepa (2021) after conducting a study on psychosocial health in a South African sample, found evidence of anxiety related to finances as well as symptoms of depression. In a systematic review conducted by Lee *et al.* (2021b), 33 countries were assessed to ascertain the impact of COVID-19 on depression. In comparison to pre-pandemic data, the prevalence of depression was 21.4% during the pandemic. Another systematic review by Salari *et al.* (2020) indicated a prevalence for stress, anxiety and depression of 29.6%, 31.9% and 33.7%, respectively. It was further suggested by Salari *et al.* (2020) that occurrences of mental challenges like psychosis, anxiety, trauma, suicidal thoughts and panic attacks were also evident. Additionally discriminatory incidences against COVID-19 patients were reported. Previously infected individuals experienced stigmatisation, which aroused emotions of trauma (Schmidt *et al.* 2020; Moyo *et al.* 2022).

2.12.1 The mental impact of COVID-19 on people with co-morbidities

One of the leading issues many people faced during the COVID-19 pandemic was fear. The Mental health foundation (2022) conceptualises fear as a response to emergency situations. Pretorius *et al.* (2021) further noted that fear is a common reaction during pandemics, endemics, or epidemics alike due to perpetual external stressors. In the context of COVID-19, there were narratives of fears of being infected (Naidu 2020) and, moreover, a fear of infecting others, in particular their family members, all of which can significantly hamper the mental health status of a person, leading to emotions and feelings of fear, anxiety, depression and distress (Pretorius *et al.* 2021). The latter can have far-reaching negative manifestations in the body. There is evidence to suggest that fear and anxiety can often lead to worse outcomes for both pre-existing mental and physical health conditions (Komiyama and Hasegawa 2021; Lentoer and Maepa 2021; Yohannes 2021).

Generally, people's fears and anxieties centre around job and food security and the fear of being infected by the virus (De Man *et al.* 2022). Particularly mental health among vulnerable groups with co-morbidities like HIV (Shiau *et al.* 2020), diabetes (Erzse *et al.* 2020; Ephraim *et al.* 2021), cardiovascular disease (Nishiga *et al.* 2020; Komiyama and Hasegawa 2021), TB (Moyo *et al.* 2020), COPD (Yohannes 2021) and other communicable and non-communicable diseases is of concern. Kang *et al.* (2015) mentioned that depression can often co-exist in patients with adverse medical conditions such as stroke and cancer, which can further lead to worse outcomes for the patients with respect to morbidity. COVID-19 has the potential to compound the existing health condition of the already ailing patient and possibly lead to a worse prognosis.

Komiyama and Hasegawa (2021) mentioned that depression can affect the heart and cause heart-related diseases owing to excess cortisol, platelets, cytokines and catecholamines. In diabetic patients, the rate of depression is 2–3 times higher than that of non-diabetics, which could affect glucose regulation and further worsen the outcomes of the disease. This can be further exacerbated by COVID-19 (Sisman *et al.* 2021). An Austrian study by Simon *et al.* (2021) noted that distress was a common factor in individuals with a physical co-morbidity in relation to the lockdown. An added concern is that people default on the collection of their chronic medication due to the fear of infection from COVID-19 and thus may not seek help when in need (Green 2020).

2.12.2 The mental health effects of those infected with COVID-19

The inter-connectedness between social and mental health acted as proponents of psychosocial challenges that emerged from the COVID-19 pandemic. These centred around the strain on the economy, loneliness, social distancing, quarantine, an increase in substance abuse and fears pertaining to the COVID-19 pandemic (Monroe *et al.* 2023). The SARS-CoV-2 infection also had significant effects on mental health. One of the major consequences was depression. The virus affected the brain through the spike protein's attachment to the ACE-2 receptors, leading to degeneration of the neurons that could have been a cause of depression in patients (Shetty *et al.* 2023). During the pandemic, quarantine and isolation were identified as the best mechanisms to prevent the spread of the virus (Moodley, Obasall and London 2020). However, this mechanism also had harmful effects on mental health, leading some individuals to experience depressive mental states. Samrah *et al.* (2020) conducted a study in Jordan and reported findings of heightened depression among patients infected with SARS-CoV-2 who were under mandatory quarantine. Of 66 participants, 44% reported depression as a symptom, and 21% were found to be at risk of major depressive disorder. Additionally, the study reported a lower risk of depressive symptoms among participants who received support from and maintained connections with family and friends through social media.

The challenges of the COVID-19 pandemic permeated the mental sphere, causing anxiety and distress. Receiving a positive COVID-19 test, increased anxiety significantly (Oyem, Wang and Viguera 2021). Isolation was another factor that promoted anxiety in COVID-19 positive patients, as Rawal *et al.* (2021) reported findings of significant anxiety in COVID-19 patients in quarantine. Furthermore, fear and isolation were thought to be contributing factors. Similarly, Tan *et al.* (2023) provided findings from a case-controlled study in Malaysia with a sample of 223 hospitalised patients, of whom 118 tested positive for COVID-19. Their study reported that anxiety in patients who had COVID-19 was significantly higher, with evidence of risk factors ranging from the presence of co-morbidities to having COVID-19. There was also a direct proportional relationship between COVID-19 severity and severe anxiety. In addition, isolation increased feelings of low mood, irritability and discomfort.

The psychosocial consequences of the pandemic were profoundly influenced by factors such as isolation, economic disruptions, and mental health issues (Dubey *et al.* 2020). These issues manifested within various mental health disorders. According to Shanmugam *et al.* (2020), those with post-traumatic stress disorder (PTSD) who were forced into isolation with family members who were the cause of their PTSD could have had their distress increased. Additionally, concerns about safety may have overwhelmed individuals with had obsessive compulsive disorder (OCD) and hygiene concerns, making it difficult to differentiate between compulsion and the need to prevent infection. A case report by Uvais (2021) presented a patient who developed OCD after infection and recovery from COVID-19. The patient displayed habitual behaviours, compulsive hygiene rituals like washing. Further, he presented with paranoia and religious obsessions. While the cause of the OCD was inconclusive, a possible connection between brain injury and SARS-CoV-2 could have been a factor. Being infected with SARS-CoV-2 can be perceived as a traumatic experience, as individuals who had higher levels of stress are more prone to experience distress from events during the COVID-19 pandemic and avoid triggers when speaking about the pandemic (Padmanabhanunni and Pretorius 2023). Kagee (2024) noted that not every event related to the COVID-19 pandemic should be considered traumatic. This is because COVID-19 can cause stress and anxiety. But it is not enough to be considered as a cause for PTSD, especially since PTSD requires strict adherence to diagnostic criteria of the DSM-5. The author also elucidated that COVID-19 fears are more future related, further consolidating the notion that PTSD should not be used trivially when speaking about COVID-19.

2.12.3 Unemployment and mental health

The World Bank (2021) indicated that the unemployment rate is predominantly higher among younger people, who are also low-income earners. It was reported that the unemployment rate among people aged 25–34 years in South Africa during the COVID-19 pandemic was 41%. Supplemental data from Posel, Oyenubi and Kollamparambil (2021) highlighted that in South Africa between February and April 2020, there were approximately 2.2 and 2.8 million job losses, which could be attributed to the lockdown and the inactivity of the nationwide economy. Unemployment has overwhelming impacts on the psychological health of people (Blustein *et al.* 2020; Pompili *et al.* 2022). Posel, Oyenubi and Kollamparambil (2021) studied the impact of unemployment on mental

health and concluded that individuals who remained employed during periods of lockdown were significantly less depressed. This suggested more significant depression among those who lost their jobs. The reasons given by Posel, Oyenubi and Kollamparambil (2021) are a “loss of identity, purpose and structure of time”, that comes with unemployment.

Another reason is that socio-economic rankings can ultimately guide levels of anxiety, as it was reported that lower income was closely linked to a worse mental status (Tull *et al.* 2020). In other research, a correlation between the rate of unemployment and suicide was evident, which is attributed to those suffering from depression (Kawohl and Nordt 2020; Pompili *et al.* 2022). Pompili *et al.* (2022) found a correlation between unemployment and anxiety and depression and high levels of distress, which detrimentally act as risk factors for suicide. For instance, COPD patients may experience stress-related anxiety to external stressors associated with finance and work, which can worsen symptoms, clearly indicating that co-morbidity, together with the burden of job security from the COVID-19 pandemic, can be problematic (Yohannes 2021). Norström *et al.* (2019) conducted a study in Sweden among adult participants. They found that unemployment led to poor health quality, anxiety and depression. Unemployment is psychological distress, which could have been especially harmful for people with co-morbidities during the COVID-19 pandemic.

2.12.4 Social media and mental health during the COVID-19 pandemic

Social media is a useful tool to spread information and awareness about events, topics and trends. However, it can also become problematic; this is further iterated by Majeed *et al.* (2020), who reported on findings of problematic social media usage and the resultant depression and fear of COVID-19, usually due to the panic it instilled. The misuse of social media can lead to miscommunication and the spread of misinformation, which, if not filtered out and checked for correctness, can lead to dire consequences, allowing people to construe this incorrect information as truth (Venegas-Vera, Colbert and Lerma 2020).

Social media is an important tool for the current society and is useful in many ways, but the negative aspect of false news is a problem that needs to be eradicated due to its effect on mental health (Zhao and Zhou 2020). Social media has assuredly helped the

general public with respect to sharing factual evidence-based health-related information and offering quick help for mental health; however, a negative consequence emerged in the form of stress and distress related to COVID-19 (Zhao and Zhou 2020; Komiyama and Hasegawa 2021). A cause for concern was also reviewed in which Salari *et al.* (2020) emphasised the effect COVID-19-related news had on people, which caused high levels of anxiety in these individuals who constantly stayed updated by COVID-19 news. In addition to this, symptoms of depression were caused by misinformation.

2.13 The family and social dynamics related to COVID-19

Fisher *et al.* (2020: 257-252) stated that “the full impact on community, work, family and its intersections is not yet clear”. In order to curb the spread of the COVID-19 infection rates, many countries, including South Africa, began massive lockdowns and implemented quarantines, bans on gatherings, travel restrictions and the closure of universities (Mbunge 2020). Studies suggested that the lockdown measures in place can have negative consequences in terms of domestic violence, sedentary lifestyles and a lack of personal spaces with concerns about job security and providing for the family during the course of the lockdown (Mackolil and Mackolil 2020). The pandemic tended to affect low- to middle-income households more adversely, while compounding the already fragile livelihoods of the disadvantaged (Gittings *et al.* 2021).

Due to COVID-19, sub-Saharan Africa faces a 1.4% reduction in its gross domestic product (GDP) with the possibility of 25 million people becoming severely poverty-stricken (Siedner *et al.* 2020). A South African study (Gittings *et al.* 2021) investigated the effect that the strict level 5 lockdown had on adolescents and young people from two provinces, namely the Eastern and Western Cape. The results by Gittings *et al.* (2021) conveyed a heightened sense of uncertainty experienced by individuals during the lockdown period with food insecurity, job security and overall livelihood precarity being among the main concerns. Previous research indicated that lockdown measures significantly reduced the spread of infection due to limited contact (Angoulvant *et al.* 2020).

While the need for lockdowns worldwide was necessary and proved valid, the impact of these vital lockdowns can also affect the mental and psychosocial well-being of people, even on an economic level (Tull *et al.* 2020). The family lifestyle has indeed faced many

challenges, from the loss of loved ones to an increase in divorce rates, unemployment, financial constraints, anxiety and the risks of violence (Lebow 2020). An alarming issue that affects many nations is gender-based violence (GBV) (Naidu 2020; Dlamini 2021) and child abuse (Chandan *et al.* 2020). With the implementation of the COVID-19 lockdown, there has been what is called a paradoxical effect, while the lockdown is meant to mitigate the increase in infection rates, there is an indirect proportional increase in the rate of GBV occurrences, while also giving the abuser more freedom during the lockdown period (Mittal and Singh 2020).

2.13.1 Family dynamics during COVID-19

The COVID-19 pandemic significantly affected family life, causing disruptions in normal day-to-day activities. Work hours changed, schools closed, and many households transitioned to working from home and implementing home-schooling (Fisher *et al.* 2020; Lebow 2020; Vanderhout *et al.* 2020; Adebiyi *et al.* 2021; Gadermann *et al.* 2021). Adebiyi *et al.* (2021: 233-236) cited the Department of Social Development, which described a family as “a micro-unit of the society. It is a societal group that is not only related by blood, and it equally includes groups related by marriage, civil union, cohabitation and foster care”. Furthermore, during times of distress such as COVID-19, families can become distressed from job losses and food insecurity (Adebiyi *et al.* 2021). This distress comes as a real-life concern, as South Africa had many losses during the early parts of the pandemic (Posel, Oyenubi and Kollamparambil 2021). Financial burden can drastically affect the lives of a family unit, leading to unfavourable family conflicts, domestic abuse and deleterious health and well-being. October *et al.* (2022) mentioned that financial concerns pertaining to food and employment status can consequentially affect the parent’s role as caregiver. Moreover, in the South African context, family resilience is dependent on the financial position of a family unit through employment.

Family life was substantially impacted during the COVID-19 pandemic with disparities between different income households (Kalil, Mayer and Shah 2020). Socio-economic inequalities played a role in the mental well-being of people due to uncertainty during COVID-19; this is further iterated by Gadermann *et al.* (2021), who emphasised the disruption of families by health inequalities and fewer economic resources. A Canadian

study identified the deteriorative mental health status of parents resulting from the pandemic due to the added pressures of working from home and having to take care of their children simultaneously (Gadermann *et al.* 2021). Lockdown restrictions led to many people working from home which can be beneficial as it removes the need to travel to work and potentially increase productivity; albeit, the downfall is the interplay between family life and work productivity including the associated costs of the internet and electricity (de Klerk, Joubert and Mosca 2021; Vyas and Butakhieo 2021).

Another impact of being under lockdown is the adoption of sedentary behaviours (Birimoglu Okuyan and Begen 2022). According to Stockwell *et al.* (2021), sedentary behaviour can affect physical, social and mental well-being negatively, while physical activity can lead to better mental and physical health. In a meta-analysis study, Guo *et al.* (2020) concludes that a correlation can be drawn between an increase in sedentary behaviour and obesity. Obesity and weight gain can be linked to various health conditions, more specifically non-communicable disease, such as diabetes, cancer, CVD and even respiratory diseases (Guo *et al.* 2020; Jayawardena *et al.* 2020; Goetjes *et al.* 2021). An analysis by Jayawardena *et al.* (2020) concluded that obesity is a causative agent of both mortality and COVID-19 infection.

Research suggests the effect of family bonding on anxiety during the COVID-19 lockdown was positive. A study by Alfawaz *et al.* (2021) ascertained that individuals who interacted with their family by exercising, having meals and other engagements indicated a reduction in feelings of anxiety and depression, thereby indicating the role of strong family bonds in difficult times. Stress can result from being confined at home, more specifically for women who, through social constructs, bear the most tasks regarding chores and care (Fisher *et al.* 2020; Quílez-Robres *et al.* 2021). Family resilience is an essential concept that allows the family unit to remain strong and empowered, while being able to recover from traumatic experiences. Additionally, the resilience of a family allows the unit to consolidate relationships among each other while intensifying their capabilities to face potential traumatic encounters. The COVID-19 pandemic allowed for strengthened resilience as increased engagement between family members produced favourable outcomes in relation to mental health and well-being through coping mechanisms during times of distress (Canzi *et al.* 2021). A deliberation by Canzi *et al.* (2021) suggested that a larger family can lead to general well-being because families are 'little social communities' that cushion the deleterious consequences of the lockdown

and social isolation. In a South African study, October *et al.* (2022) explored the multi-faceted impact of COVID-19 on family life. The study reports that the lockdown can contribute to an increased sense of togetherness due to the amount of time spent with each other. The study further showed that the time spent with family members amalgamates social bonds among each other. Additionally, higher rates of communication between family members using social media platforms were noted due to the lack of physical contact.

The role of family can be viewed as an indispensable commodity, as the family unit provides emotional and social support. The family compensates on many levels by providing feelings of security and support, while assisting with tasks such as running errands (Frenzel *et al.* 2022). This is essentially important in homes with ill family members, as caregivers have a fundamental responsibility and position towards people with co-morbidities. It is imperative to understand that both caregivers as well as recipients of care, who have co-morbidities, were severely affected during the COVID-19 pandemic (Bergmann and Wagner 2021). According to Bergmann and Wagner (2021) who reported on findings from a European study on the impact of COVID-19 on caregivers and care recipients, caregivers experienced feelings of anxiety and depression during the lockdown, which were further impacted by the COVID-19 restrictions in place. The study further reported that individuals who received care experienced negative effects on their health with feelings of anxiety, depression and loneliness, which were attributable to the COVID-19 lockdown, restrictive measures in place and the fear of becoming infected with COVID-19. A study by Beach *et al.* (2021) compared caregivers and non-caregivers during the COVID-19 pandemic to identify stress and anxiety. A notable increase in anxiety, depression and sleep irregularities was higher among caregivers. The reasons were attributed to food security and financial problems. Furthermore, COVID-19 affected the retrieval of medication, doctor's appointments and other caregiver-related tasks. These obstructions can affect the mental well-being of the caregiver, while the additional burden of the deteriorating health of the person receiving care can further impact the caregiver's well-being.

2.13.2 Social life during COVID-19

Extended periods of social isolation are not conducive to the nature of humans as social beings (Pietrabissa and Simpson 2020). The attempt to prevent the spread of COVID-19 has affected social life (Quílez-Robres *et al.* 2021) ubiquitously resulting in decreased physical interactions due to social isolation, which has resulted in varying levels of anxiety, stress and depression (Cauberghe *et al.* 2021). Poor mental well-being can ensue as a consequence of loneliness and limited contact (Fluharty and Fancourt 2021). People with pre-existing mental illness could be negatively impacted due to the lockdown and isolation, as they may find it difficult to receive emotional support, thus provoking suicidal thoughts and increasing the risk of suicide (Pompili *et al.* 2022). Apart from suicidal tendencies, many individuals lack the necessary coping mechanisms to deal with external stressors such as a pandemic, leading to loneliness, anxiety and depressive symptoms (Tull *et al.* 2020).

Greig *et al.* (2022) determined in a UK study that loneliness led to self-harm, the use of alcohol, antidepressants and drugs and with symptoms of depressed mood. Harmful behaviours such as the use of alcohol and smoking to cope with stress can often lead to the worsening of pre-existing pathologies like CVD and COPD (Komiya and Hasegawa 2021; Yohannes 2021). In a contrasting study, Evans *et al.* (2021) conjectured that depressive symptoms may be related more to the COVID-19 virus than to mitigation measures put in place by the government with a decline in alcohol consumption speculatively due to decreased social events. Pietrabissa and Simpson (2020) alluded that a superfluous amount of social isolation can adversely affect individuals living alone, consequently causing depression and other concomitant features of isolation, namely cognitive impairment, reduced immunity, increased risk of cardiovascular disease and ultimately, mortality. In contrast better social relationships results in improved mental well-being (Sommerlad *et al.* 2021).

2.14 The Healthcare System and COVID-19

South Africa consists of both private and public healthcare with 83% of the population dependent on public health (Ngobeni, Breitenbach and Aye 2020). COVID-19 had significantly challenged the healthcare system, which was already encumbered by other diseases (Mbunge 2020). Laboratory testing confirmed 4.08 million COVID-19 cases as

of January 2024, with 102 595 deaths and 12 223 448 PCR tests conducted in South Africa (Andra farm 2024). The cumulative statistics for 2023 in KwaZulu-Natal revealed 729 957 cases of infection (NICD 2024).

There is a prodigious concern pertaining to the delivery of basic healthcare to persons globally and in particular, to persons with co-morbidities like non-communicable chronic diseases and communicable diseases (Siedner *et al.* 2020). Healthcare systems can often times become strained during a pandemic due to the influx of patients; therefore, measures are put in place to ensure the efficacy of treatment, like surveillance enhancement with contact tracing and increasing the capacity of testing (Legido-Quigley *et al.* 2020). The enhancement of the medical workforce is necessary to ensure that the surges of COVID-19 infections and the influx of patient admissions in hospitals are dealt with appropriately. These can be done by asking retired doctors to begin work again, redeploying specialists in areas of need and obtaining military aid (Willan *et al.* 2020). Additional key factors that were necessary to ensure optimal patient care included increasing bed capacity, utilising public facilities to create temporary community stations where patients with mild COVID-19 symptoms could be admitted until they have recovered, asking patients to quarantine at home if they were able to do so and having dedicated COVID-19 hospitals (Her 2020). Africa, on the other hand, was at great risk of becoming overwhelmed due to many communities being from the low- to middle-income strata with poor medical health systems. In particular, South Africa has some hospitals containing less than 150 beds, while other African countries have limited capacity for intensive care and prolonged ventilation (Mash *et al.* 2021).

People with co-morbidities are the most vulnerable and it is necessary to understand their experiences of healthcare during the pandemic. In Cape Town, Metro Health Services initiated a home delivery system to deliver medications to people with co-morbidities, which was a necessary construct to avoid interaction with chronically ill patients and to avail healthcare facilities. This system proved necessary and was well received on both ends, namely patient and healthcare worker, while also improving patient compliance with medication (Mash *et al.* 2022).

Siedner *et al.* (2020) observed the foot traffic of patients at several community healthcare facilities in South Africa to establish whether there was a decrease or increase in patient visits. Interestingly, during the hard lockdown period, patients on chronic medication, perinatal treatment and family planning remained reasonably comparable to pre-

lockdown or were slightly elevated while immunisations decreased. Contrasting findings from Burger *et al.* (2021) in healthcare facilities in Johannesburg saw a decline in patients ranging from 30 to 70%, albeit not a representation of national statistics, with TB testing also decreasing during the hard lockdown by 48%. Another South African study assessing private care saw below-normal levels of hospitalisation for acute and chronic conditions (Perofsky *et al.* 2022). Reasons for a decline in patient numbers could be attributed to fears relating to COVID-19 infection, mandated social distancing and the modification of healthcare by reallocating health workers to the forefront of the COVID-19 pandemic (Nyasulu and Pandya 2020). A concern that further compounds the negative effects of communicable and non-communicable diseases is the disruption of health-related services due an interruption of the supply chain. Data cited from Inzaule *et al.* (2021) showed that the retrieval of medication during the lockdown in April 2020 was not possible among 13.2% of participants in a South African survey. Alluding to the deterioration of pre-existing health conditions.

The pandemic has had huge ramifications on both pre-existing physical and mental health conditions. Mental health had borne the brunt on many levels, from experiencing anxiety and depressive symptoms to the limited access to health service faculties for mental health as a consequence of travel complications and fear of contamination, to name a few (Nguse and Wassenaar 2021). Mental health has been a ubiquitously trivialised facet of healthcare. At the onset of the COVID-19 pandemic, both pre-existing and COVID-19-related mental health concerns were projected to be exacerbated. This was partly due to limited face-to-face consultations and resorting to online therapy sessions, or a total lack of psychotherapy. For persons with established mental health disorders, this is a cause for concern as it could cause catastrophic relapses, suicides and exacerbated conditions (Moreno *et al.* 2020). While the private healthcare setting had already established telehealth services with online consultations, the public healthcare sector had straggled behind; however, the obvious reason is the limited access to the necessary infrastructure such as proper internet (Pillay and Kramers-Olen 2021).

South Africa faced a mass shortage of ICU beds at the start of the pandemic, the shortfall needed to be addressed, which led to the restructuring of ICUs and an adjusted triage allowing only the necessary ICU admissions (Morrow *et al.* 2020). Additionally, many healthcare facilities had to reprioritise their space due to the surge of COVID-19 cases

and cancel elective surgical procedures. The Western Cape recorded a decrease in elective surgeries by 70%, which consequently led to a backlog of elective surgeries (Chu *et al.* 2021). Elective surgeries are considered operations that can be delayed due to the lack of remarkable damage to the patient's potential prognosis. An American study by Sequeira *et al.* (2021) ascertained that a postponement of elective surgical procedures can cause worsening of physical and mental well-being.

2.15 Holistic health and alternative treatments used during COVID-19

The health and well-being of the human body are fundamentally important in its ability to resist infection from SARS-CoV-2 as well as defend itself. There are many health care modalities in the world apart from the orthodox, mainstream allopathic medicine that people utilise to establish physical and mental well-being. The standard treatment protocol in the initial phases of COVID-19 was supportive therapy as no preliminary 'coronaviral' therapy was established. These treatment strategies included methylprednisolone, ascorbic acid, thiamine, heparin and co-interventions (MATH+) (Kory *et al.* 2021). A series of more invasive therapies were also put in place for more severe respiratory involvement, namely extracorporeal membrane oxygenation, high-flow nasal oxygen and endotracheal intubation (Umakanthan *et al.* 2020). Prevention, emphasised by numerous nations, globally as the key strategy in containing the spread of COVID-19. Essential practices such as handwashing, social distancing (Mirzaie *et al.* 2020), and wearing masks (Gondim 2021) played a crucial role in this preventive approach.

People with co-morbidities are usually prescribed numerous drugs to treat their conditions. Callender *et al.* (2020: 1-16) stated that "the myriad of drugs prescribed for these comorbidities will also influence the progression of COVID-19 and limit additional treatment options available for COVID-19". In South Africa, the use of alternative medicines is governed by the Allied Health Professions Council of South Africa (AHPSCA 2022). The use of complementary and alternative medicines are rising globally (van Rensburg, Razlog and Pellow 2020). Essential oils are considered a proposed treatment for COVID-19 as exhibited anti-viral effects in the past. Garlic oil and eucalyptus oil showed efficacy in treatment against SARS-CoV-2 in *in vitro* studies (Asif *et al.* 2020)

In a survey study in Hong Kong by Lam *et al.* (2021) with 632 respondents, traditional, complementary and integrative medicine was ascertained to be used by 44% of the participants. Herbal medicine and traditional Chinese medicine (TCM) appear to offer some anti-viral properties, even though these substances are understudied. TCM has been shown to produce effective results by its ability to block viral replication and proliferation (Mirzaie *et al.* 2020) with more than 85% of COVID-19 patients in China in receiving TCM (Wang *et al.* 2020).

It is projected that around 70% of South Africans use traditional medicine consistently with the WHO concurring on the benefits of traditional medicine (Bhuda and Marumo 2020). A South African study was conducted to assess the use of traditional medicine against COVID-19 among university academic staff and students and they found that 30.4% of the respondents used traditional medicine against COVID-19. Furthermore, participants in the study who were affected by mental constraints such as anxiety and depression used traditional medicine. An inference was made that people who did not attend medical appointments used traditional medicine, possibly due to the fear of going out and contamination (Mphekgwana, Makgahlela and Mothiba 2021) The use of natural extracts can also be beneficial as recent data from Wang *et al.* (2020) stated that

(1) anti-malaria drugs, including chloroquine and hydroxychloroquine, (2) antivirals including nucleoside analog (remdesivir, favipiravir, β -D-N4-hydroxycytidine, ribavirin and among others), lopinavir/ritonavir (LPV/RTV) and arbidol, (3) antibiotics including azithromycin, ivermectin and teicoplanin, as well as (4) anti-protozoal drugs, emetine, anti-cancer drugs, homoharringtonine show effectivity.

However, these drugs are already being used in the clinical setting. More than 120 clinical drugs are derived from plant sources (Bhuda and Marumo 2020).

Ayurveda is a system of alternative medicine used widely in India to act on immunomodulation and boost immunity. Practices endorsed by ayurveda, include drinking warm water, the use of spices such as garlic, turmeric powder and cumin, drinking herbal teas like cinnamon and basil and the utilisation of oils, namely coconut oil and sesame seed oil. Ayurveda can also be used to reduce mental health symptoms, such as depression, anxiety and stress, which are profound mental symptoms attributed to the COVID-19 pandemic (Rajkumar 2020). Wanjarkhedkar *et al.* (2022) endeavoured

to show the clinical significance of the use of ayurveda in COVID-19. The study showed effectiveness in reducing breathlessness; additionally, a decrease in ageusia and a shorter hospital stay were observed. Ayurveda phytomedicines are commonly used for their immune system effects. Some of these plants are *Asparagus racemosus*, *Tinospora cordifolia* and *Withania somnifera*. An *in silico* study by Borse *et al.* (2021) showed that these botanical remedies may have specific effects on improving the COVID-19 pathophysiological process; however, this study is not a clinical practice-evidenced study. Borse *et al.* (2021) found that these botanical medicines may be able to boost the immune system, while helping in the and inflammatory response, they could reduce hyperpermeability and assist in alveolar consolidation by allowing pneumocytes to maintain their interaction with oxygen.

At the onset of COVID-19, as tensions about the virus began, so too did an interest in immune-boosting agents, particularly against SARS-CoV-2. This led to an escalation in queries around dietary supplementation, vitamins, minerals and other related substances that would be effective against COVID-19 (Hamulka *et al.* 2021). Common vitamins used during the pandemic were vitamin C and vitamin D with vitamin D deficiency being linked to a higher mortality rate (Hiedra *et al.* 2020; Shakoor *et al.* 2021). Vitamin C and D have been recognised to exhibit both anti-inflammatory and immune-supporting features; additionally, vitamin B deficiency has been linked to cell impairment (Shakoor *et al.* 2021).

Zinc is a mineral that has been correlated with anti-viral effects and identified to demonstrate anti-inflammatory properties. During the pandemic, zinc has been seen to have the potential of a preventative option against COVID-19 (Chinni *et al.* 2021). Research showing evidence into the use of herbal medicine is numerous, specifically herbal remedies to offer ease of respiratory symptoms and boost immunity, albeit caution is advised as these medicines are often not studied enough and their efficacy might be limited to anecdotal evidence or *in vitro* studies (Silveira *et al.* 2020; Paudyal *et al.* 2022). Some of these herbal medicines included are curcumin, quinine and echinacea with *Withania somnifera* indicating inhibitory activity against COVID-19 in *in vitro* studies (Paudyal *et al.* 2022). Comprehensible corroboration from research denotes that elevated blood glucose levels may contribute to a more severe outcome in COVID-19, increasing the likelihood of a heightened need for mechanical ventilation. Individuals who are both obese and diabetic are particularly at risk in this regard. Therefore, it is vital

to maintain healthy diets and develop exercise routines to diminish the detrimental effects of COVID-19 on the body (Chesnut, MacDonald and Wambier 2021). CAM is useful for many, however it does not come without risk, as there are often safety concerns around its use. Additionally, there are issues around effectiveness which is based on the assumption that it could be a placebo effect (Beedie *et al.* 2018). A study by Jeon *et al.* (2022) gave an overview of 24 systematic reviews for the use of CAM in COVID-19 patients. Their study found that while TCM, homeopathy, ayurveda and other CAMs were used in abundance. The knowledge of their safety and effectiveness were limited, hence more clinical evidence is needed.

2.16 Summary of the chapter

This chapter reviewed existing literature on COVID-19 and its multi-level impact on patients with co-morbidities, particularly the impact on physical and mental well-being in patients with co-morbidities. The chapter also focussed on the impact of COVID-19 on family and social dynamics, healthcare and holistic health with respect to alternative treatments utilised during the pandemic. The literature indicated several significant corroborations between the impact of COVID-19 and co-morbidities, showing that the presence of co-morbidities largely affects the progression of COVID-19, often leading to disease severity and mortality. The review also exhibited the impact of COVID-19 on mental health both directly through infection concerns for individuals and their family members, and indirectly through the emergence of notable feelings of distress, anxiety, and depression. Unemployment owing to the lockdown was a clear emotional stressor that led to mental health concerns. The reviewed literature revealed comprehensible disruptions in family and social life, because of lockdown enforcements, recommended social distancing, isolation and work-from-home conditions. The literature review also showed how disruptions in healthcare affected patients' retrieval of chronic medication and healthcare services. In addition, patients found alternative treatments to offer some benefits in achieving holistic physical and mental well-being during the COVID-19 pandemic.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

This chapter discusses the chosen research design, the researcher's role and reflexivity, the study setting in which the research will be conducted, the study population of interest, and the study sample in question. The sampling strategies used, and the sampling process will be discussed. The data collection process and data collection tool used are also described in detail and an in-depth explanation of the procedure for data collection and data analysis is presented. This chapter also includes a description of trustworthiness and ethical considerations.

3.2 Research design

The research design of a study according to Flick (2014), is a plan or blueprint that acts as a tool for answering the set research questions through a process of data collection and data analysis. Furthermore, a research design is an all-encompassing aspect of a study in which every detail of the research study is covered within its domain.

Qualitative research was adopted as the research methodology for this study. Qualitative research designs explore the in-depth lived experiences of individuals (Given 2008; Salkind 2010). Further, Flick (2014: 542) stated that "qualitative research methodologies incorporate analysing subjective meaning or the social production of issues, events, or practices by collecting non-standardised data and analysing texts and images rather than number and statistics".

Therefore, the qualitative paradigm was an appropriate research method for this study, as it aimed to explore and understand patient experiences in relation to COVID-19. The rationale for consideration of a qualitative approach is further emphasised by its coverage of the various factors on human nature, including its ability to understand people and places that are difficult to quantify using statistical mechanisms, characteristic of the quantitative paradigm (Dudovskiy 2022). In qualitative research, there is no hypothesis to test but rather the utilisation of in-depth interviews with open-ended questions and participant observations that are assessed (Barroga and Matanguihan 2022). This lent support for the relevance of this methodological approach

in the study. The study did not test a hypothesis, but it explored the nature of COVID-19 and its interaction amongst those with co-morbidities. The COVID-19 pandemic was novel and presented psychosocial challenges for people across the globe (Dubey *et al.* 2020). People with co-morbidities were affected tremendously on many levels, both physically and mentally (Sanyaolu *et al.* 2020). These individuals also faced extraordinary challenges both socially and economically (Shanmugam *et al.* 2020). Therefore, the appropriateness of a qualitative approach proved beneficial in the quest to explore, understand and gain deeper insight into the lives of those with co-morbidities.

This approach builds rapport and trust with the participant, while maintaining records through the writing of field notes on what is heard and seen by the researcher (Bogdan and Biklen 1997). The qualitative research approach encapsulates numerous benefits, namely the provision of rich data from the participants based on their opinions, emotions and feelings, on which this research study heavily relies. The qualitative approach also gives a holistic view of the participant (Creswell 2014). This was noteworthy in this research study as the holistic view of the patient, provided the best results in the development of a list of recommendations that could benefit patients with chronic conditions and improve healthcare and well-being. A qualitative approach explores individuality and allows views and opinions to be explored and understood, which provided uniqueness on a case-by-case representation (Rahman 2016).

The chosen methodology was considered salient, because the qualitative approach often uses interviews as a tool to obtain data. Therefore, in this study, the use of semi-structured interviews allowed for flexibility and the guide, did not conform to a fixed or rigid list of questions, thereby allowing participants to express themselves freely (Rahman 2016). Denzin and Lincoln (2011) highlighted that qualitative research in the healthcare field focuses on the experience of patients that occurs from their illness, which includes their behaviour and emotional states. Further, the paradigm incorporates acute and chronic diseases, the caregiver and the healthcare system. The qualitative approach was therefore applicable to the objectives of the study, allowing for rich data to emerge through the voices of those with co-morbidities. The design also incorporated detailed descriptions of the events and experiences of patients with co-morbidities during the COVID-19 pandemic. Furthermore, the multifactorial components of physical health and psychosocial influences like mental health, family, the economy, and isolation were explored, which provided a more in-depth understanding of how a vulnerable group of

people was affected. Therefore, the selected qualitative method for this study was based on its ability to provide the researcher with a deeper and more complex understanding of the experiences of the research participants. This approach allowed for first-hand observation of their emotions and responses in relation to the pandemic, which could not be achieved through quantitative methods (Rahman 2016).

An exploratory-descriptive design was also used to guide the study. This type of research methodology combines individual 'exploratory' and 'descriptive' research methods. Reid-Searl and Happell (2012) indicated that exploratory qualitative research is used to gain information from research participants in areas of research that lack knowledge and information or where there is limited research in the field. The authors further acknowledged that this method of research allows for new knowledge to be attained in a particular field based on the knowledge and opinions of the participants. The descriptive methodology in qualitative research is underpinned by a pursuit in the quest to understand a phenomenon, a process, or perspectives and opinions of the people in question. Further, the use of descriptive research exhibits appropriateness for this study as the knowledge acquired is directly attained from those people that the phenomenon or event directly affected (Bradshaw, Atkinson and Doody 2017). Stebbins (2001: 3) defined exploratory research as "a broad-ranging, purposive, systematic, prearranged undertaking designed to maximise the discovery of generalisations leading to description and understanding of an area of social or psychological life. Such exploration is, depending on the standpoint taken, a distinctive way of conducting science—a scientific process—a special methodological approach".

Sandelowski (2000: 336) stated, "qualitative descriptive studies offer a comprehensive summary of an event in the everyday terms of those events". The author further noted that qualitative descriptive research often asks questions that get straight to the point and requires concise answers. Additionally, the qualitative descriptive research design, while different, shares undertones of other qualitative research approaches like grounded theory, phenomenology and ethnography. Despite these approaches or designs being available, they did not cohere with the objectives of the study. For example grounded theory, which focuses on developing a theory through constant comparative analysis, memoing, theoretical sampling and theoretical sensitivity was not seen to be aligned with the objectives of this study (Chun Tie, Birks and Francis 2019). The objectives were to understand the holistic experiences of those with co-morbidities, not

develop a theory around it. Furthermore, a phenomenological approach was not deemed as suitable, as the inquiry did not delve into the lived experiences of those with co-morbidities in the grips of the pandemic. Hence the transcendental and hermeneutic methods were not seen as linked to the study objectives (Neubauer, Witkop and Varpio 2019). Ethnography which is useful in understanding the experiences, of a given cultural group was not suited to the objectives, and hence not seen to support the objectives of the study (Reeves, Kuper and Hodges 2008). The benefit of the exploratory-descriptive qualitative method was that it allowed for an opportunity to explore the novelty of COVID-19 and its effects on those with co-morbidities.

Hunter, McCallum and Howes (2019) described exploratory-descriptive qualitative research as examining a phenomenon of interest, while gaining insight into the phenomenon. Exploratory-descriptive research provides the least control over variables and explains phenomena using data that is collected from the perspectives of participants (Brink and Wood 1998). An exploratory-descriptive design proved to be a suitable choice for this research as it explored the experiences of patients with co-morbidities that were affected by COVID-19 (Given 2008). This study both examined and gained insight into the lives of participants affected and infected by COVID-19, while having a co-morbidity. The use of a qualitative paradigm, namely exploratory-descriptive qualitative research methodology, proved to be the optimal choice as it allowed the participants to share their experiences, while allowing the researcher to describe these events to gain deep and insightful understanding of COVID-19 and its multi-faceted impacts on people with co-morbidities.

3.3 Researcher's role and reflexivity

There exists a substantial difference between a quantitative researcher and a qualitative researcher. The quantitative researcher's role is one that attempts to quantify variables with the researcher and research participants are considered separate entities in the research process, to remove bias. The qualitative researcher, on the other hand, is considered an instrument of data collection and is directly involved in obtaining information from the participants (Fink 2000). The quantitative researcher is concerned with quantity, such as how many people were affected, rather than how they were affected. Further, the qualitative researcher should possess the tools to evaluate and

understand the emotions and feelings of research participants to aid in the development of meaning and the understanding of the fundamentals of their experiences (Sutton and Austin 2015).

Reflexivity holds significance in qualitative research and is described by Schwandt (1997), as an introspection of the researcher involved in the study relating to their biases, understandings and ideas. Additionally, the researcher should assess their standing within the study's focus area. Dodgson (2019: 220-222) described reflexivity as ensuring the credibility of research findings by describing the intersecting relationship between researcher and participants in relation to "focus on self-knowledge and sensitivity; to better understand the role of the self in the creation of knowledge; carefully self-monitor the impact of their biases, beliefs and personal experiences on their research". The researcher understands that his views, experiences and biases will not in any way interfere in the research process or the outcomes of the research. Reflexivity is the awareness of the influence that the researcher has on the participants and focus area, while in turn being cognisant of the influence that the experiences from the process can have on the researcher, while maintaining the trustworthiness and richness of the data (Probst 2015).

The researcher is a homoeopath and as such, understands the complexities between the disease process and the trauma that it causes patients and their families. The researcher thus understands the need to maintain neutrality throughout the research process and gives precedence to the participants, allowing their thoughts, opinions and experiences to come through with the least interference from the researcher. While being a homoeopath has allowed the researcher to gain deep insight into diseases and their influence on people, it is necessary that this does not form the basis for any bias and change the course of the research process. Homoeopathy is a holistic system of healing that was founded by Dr Samuel Hahnemann in Germany. Homoeopathy takes into account the mental, physical and emotional well-being of an individual (Das 2019). Homoeopathy relies on provings to show its effectiveness and is based on the principle of '*like cures like*' also known as the Law of Similars, whereby a substance administered to a healthy individual in its crude form can produce symptoms. But if given in a minute dosage can alleviate those same symptoms in an unhealthy individual (Mukerji and Ernst 2022). Homoeopathic remedies often utilize dangerous substances like snake venom, therefore a process of potentisation is done to ensure the safety and effectiveness of

remedies. This process involves dilution of the crude substance and subsequent succussion in which the remedy is vigorously shaken (Das 2019). It is of the understanding that these vital process in remedy manufacturing improves the potent effects of a remedy and ensures effectivity There is limited clinical evidence for the use of homoeopathy with some attributing its effectiveness to a placebo effect, despite this homeopathy is used widely across the world (Cukaci *et al.* 2020; Mukerji and Ernst 2022). While the present study did not use any homoeopathic principles, the biopsychosocial model which guided the study largely ties in with the holistic involvement of the mental, physical and emotional well-being of an individual.

3.4 Study setting

Snowdon, Brocklehurst and Tasker (2014) emphasised that the qualitative research design is largely dependent on the context in which the phenomenon occurs. The research setting is an important aspect of any research design and is distinguishable by the physical, social and cultural place in which a research study is conducted (Given 2008). This study was implemented at a public health community clinic in the suburb of Phoenix in the eThekweni metropolitan municipality of KwaZulu-Natal in South Africa as shown in Figure 3.1.

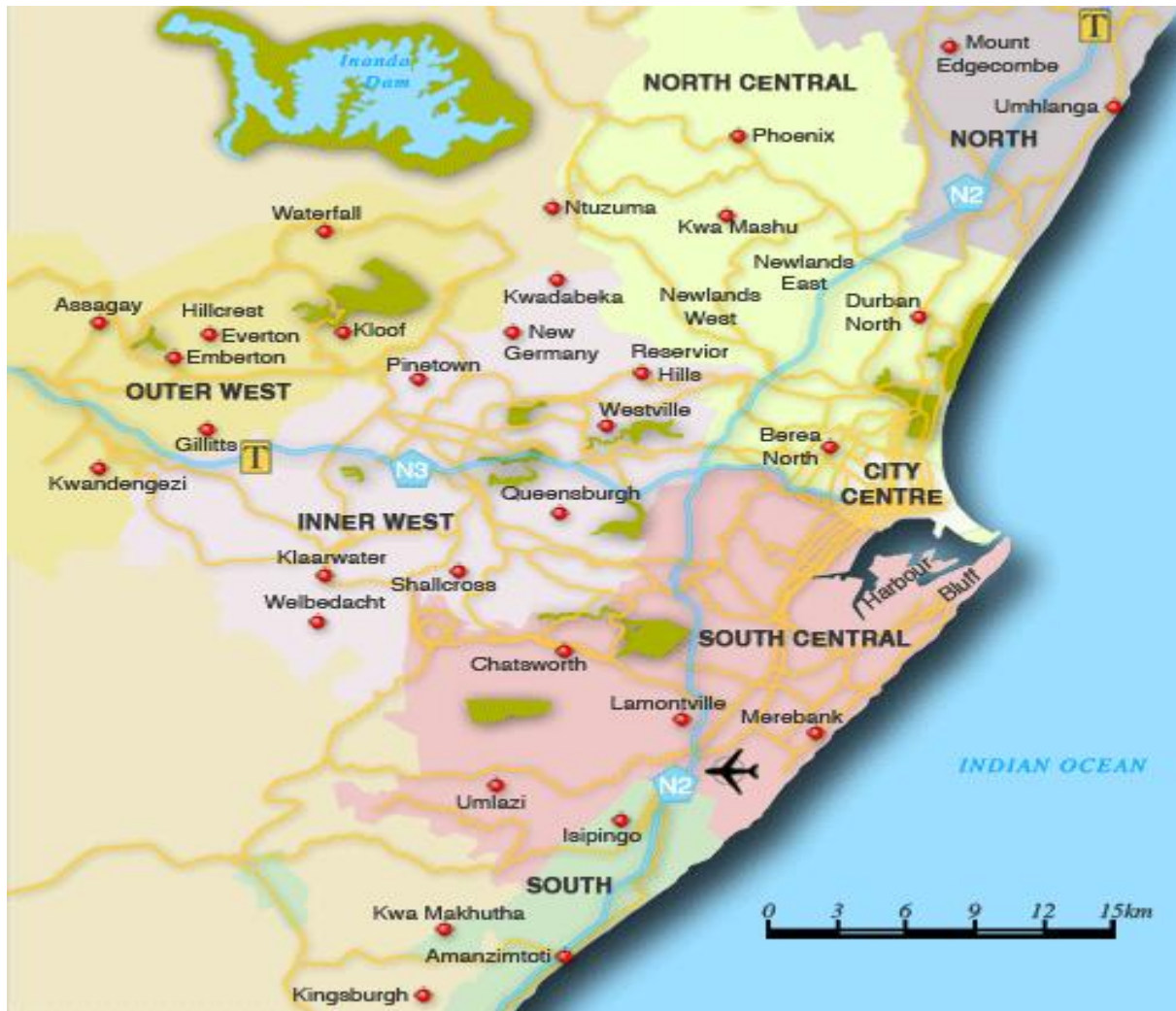


Figure 3.1: A map showing the Province of KwaZulu-Natal and Phoenix

A map of the KwaZulu-Natal province and Phoenix. Note: adapted from (Rooms for Africa 2024).

KwaZulu-Natal is located in the eastern parts of South Africa and has a surface area of 94 361km². It is the third-smallest province in SA by land mass and has a population of 11 065 240, which makes it the second-largest populated province in the country. The largest city in KwaZulu-Natal is Durban and the provincial capital is Pietermaritzburg. Further, the province has 10 districts and 43 local municipalities (Municipalities of South Africa 2022). eThekweni is the largest metropolitan municipality in KwaZulu-Natal and the third largest in South Africa with a surface area of 2 566 km². eThekweni also boasts Africa's busiest port (Municipalities of South Africa 2022). eThekweni has a population of 3 990 000 (Macrotrends 2022).

The Phoenix Settlement, established in 1976, is located in the city of eThekweni. The population of Phoenix is estimated at 176 989 (City population 2022). The Grove End Clinic is in the community of Grove End, which is in Phoenix. The clinic meets the needs of the local community as well as those in other nearby regions. The clinic is governed by the eThekweni Department of Health and serves the community based on its vast scope of practice. The clinic boasts a wide array of medical services, namely immunisations, contraceptive implants and placement of contraceptive intrauterine devices, treatment of acute and chronic conditions, distribution of chronic medication and family planning, HIV and AIDS testing, treatment and counselling, screening of sexually transmitted diseases and many other procedures. The clinic has one main entry point, a reception area at the entrance, a large waiting area, a second waiting area for mothers and children, a screening room for vitals, one spare room, three main patient attending rooms, a dispensary and three offices with ablution facilities.

Phoenix was considered the epicentre of the COVID-19 pandemic in the eThekweni municipality (The Witness 2021). Therefore, the study's geographical location was appropriate as it allowed for an insight into the lives of people with co-morbidities in a high-risk area for COVID-19 infection.

3.5 Study population

By definition, Salkind (2010: 1-8) states that the population of a study is: "the entire collection of entities one seeks to understand or, more formally, about which one seeks to draw an inference". Grove, Burns and Gray (2013) further expressed that the study population comprises of all those individuals who are congruous with the inclusion criteria of a study. The research population for this study included people both infected with SARS-CoV-2 3 months after infection and affected by COVID-19, who also have one or more co-morbidities from the Grove End public community health clinic in the eThekweni area of KwaZulu-Natal.

3.6 Study sample

Researchers use a sample to study the entire population in question. It is ideal to study the entire population; however, this is impractical. Therefore, the best method to study

the entire population in keeping with a feasible approach is to study a sample of the population (Vehovar, Toepoel and Steinmetz 2016). Table 3.1. represents the two samples used in this study.

Table 3.1: A representation of the sample groups

Sample category	Number (N) of patients
Sample 1: Patients affected by COVID-19	N = 8
Sample 2: Patients previously infected by COVID-19 (post three months)	N = 18
Total	26

The initial goal was to obtain two samples with eight participants each. However, data collection continued until saturation was reached in order to maintain validity (Fusch and Ness 2015). The first sample included eight participants who were affected by COVID-19 in any manner or form but were not infected. This sample needed to have at least one or more comorbidities. The second sample contained eighteen participants who were specifically infected by COVID-19 post three months infection and had at least one or more co-morbidities. The co-morbidities were not limited to specific conditions. Whilst all participants were of the Indian race group, this was expected as the Indian community reside primarily in this area. The intent however was to understand the experiences of those with co-morbidities and the information richness derived from this group, offset this limitation.

3.7 Sampling strategy

A sampling strategy is an important part of any research study and in particular for this research qualitative study (Onwuegbuzie and Leech 2007). Sampling strategies are essential as they allow for the selection of sample groups based on the population in question for the purposes of studying that population through the sample group. It is important to study samples instead of entire populations, as a population can be too large to study effectively. Therefore, a sample selection is most feasible (Berndt 2020).

The process of sampling thus exhibits efficacy. A non-probability sampling methodology was used for this study, specifically the purposive sampling and snowball sampling methodologies.

Non-probability sampling

Researchers must determine the choice of sampling approaches that will be used in their study. Two strategies are considered when determining the appropriate method, namely probability sampling and non-probability sampling. The probability sampling method gives every component of the target population an equal chance of being selected to participate in the study (Daniel 2012). The probability sampling approach further denotes a randomisation strategy that allows all participatory units to be selected based solely on the inclusion criteria. Additionally, a probability sample strategy does not allow an arbitration or judgement-based approach for the selection of participants (Vehovar, Toepoel and Steinmetz 2016).

A non-probability sample is best suited to qualitative research with an exploratory research design, which is applicable to this study (Daniel 2012). This research study called for the use of the non-probability sampling methodology, as participants were selected based on the inclusion and exclusion criteria determined by the researcher. A pertinent reason for a non-probability sample approach is that the target population may not be adequately represented by the sample due to the absence of randomisation. Here, the researcher selected participants based on arbitration (Ayhan 2011).

Purposive sampling

Purposive sampling uses the arbitrary judgement of the researcher to determine who will participate in the study based on certain inclusion criteria that the researcher sets (Acharya *et al.* 2013). The selected sample is the closest representation of the population (Elfil and Negida 2017). By using the purposive sampling method, the researcher needed to fulfil certain criteria, namely state the target population, formulate the inclusion and exclusion criteria, give a recruitment strategy, state the sample size and identify the elements of the target population (Daniel 2012).

This research design used a purposive sampling method, as it was the best approach to arbitrarily seek out participants that fit the inclusion and exclusion criteria for the purposes of this study. This study depended largely on the experiences of patients, who were infected with or affected by COVID-19. Therefore, it was of vital importance that patients were screened against this criterion to get the best and most in-depth views from patients who had the most congruous representation with the target population. Further, a qualitative research design aims to ascertain information-rich contexts for analysis and purposive sampling aided the researcher in finding the most appropriate participants for rich data (Palinkas *et al.* 2015). A total of sixteen participants were recruited using purposive sampling.

Snowball sampling

Snowball sampling uses a referral-based sampling strategy to gain more participants (Kirchherr and Charles 2018). This referral-based system of recruiting participants begins with a few already recruited participants who are then asked to suggest potential participants who are willing to join the study. These potential participants must also fit the research inclusion criterion (Parker, Sam and Alistair 2019). This method of sampling can be employed if there is difficulty accessing participants (Elfil and Negida 2017). This form of sampling can continue until the required number of participants are attained or until data saturation is reached. This continuous referral is the 'snowball effect' and is becoming a widely used form of sampling in qualitative research (Noy 2008).

The snowball sampling methodology was used when the recruitment of all participants was not possible through the manager of the Grove End Clinic. This assisted the researcher in recruiting more research participants through a referral-based system through participants already recruited by the manager. In doing so, many more participants were recruited, which allowed for data saturation and in-depth, information-rich data collection. The total number of participants recruited using the snowball sampling method was ten. These participants were infected by SARS-CoV-2 post three months.

3.8 Inclusion and exclusion criteria

The use of inclusion and exclusion criteria is common practice in research studies involving participants. The inclusion criteria of a study are perceived as the qualities that the target population has that can be used to answer the research questions. The exclusion criteria display those features that indicate the ineligibility of participants for a given study (Patino and Ferreira 2018). This study has two samples with two sets of inclusion and exclusion criteria each.

3.8.1 Sample 1 - Patients affected by COVID-19

Sample 1 included patients who were affected by COVID-19 and not infected. The inclusion and exclusion criteria for this sample are as follows:

Inclusion criteria:

- Patients of the Grove End Public Health Community Clinic
- Patients affected by, but not infected by COVID-19
- All racial groupings
- All ethnicities
- English- or isiZulu-speaking participants
- Patients consenting to the study
- Patients above the age of 18

Exclusion criteria:

- Patients who did not attend the Grove End Public Health Community Clinic
- Non-English or non-isiZulu speakers
- Those who did not give consent
- Patients below the age of 18

3.8.2 Sample 2: Patients infected with COVID-19, post three months

Sample 2 included patients who were infected by COVID-19; however, they must not have had COVID-19 in the last three months. The inclusion and exclusion criteria for this sample are as follows:

Inclusion criteria:

- Patients of the Grove End Public Health Community Clinic
- Patients specifically infected by COVID-19, post three months
- All racial groupings
- All ethnicities
- English- or isiZulu-speaking participants
- Patients consenting to the study
- Patients above the age of 18

Exclusion criteria:

- Patients who did not attend the Grove End Public Health Community Clinic
- Non-English and non-isiZulu speakers
- Those who did not give consent
- Patients below the age of 18

3.9 Recruitment process

The recruitment of participants for this study began after ethical clearance was obtained from the Institutional Research Ethics Committee (IREC) at the Durban University of Technology (DUT) (see appendix G). The researcher then contacted the local municipality in charge of the Grove End Clinic to obtain gatekeeper permission to access patients willing to be interviewed. The gatekeeper permission is attached (see Appendix C1). Purposive sampling and snowball sampling were used to recruit participants between July 2022 and November 2023.

The researcher appealed to the manager or administrator of the clinic to ask patients who were willing to volunteer for the interview (see Appendices D1a, D1b, D2a and D2b)

to be contacted by the researcher. The researcher provided the manager of the clinic with the research proposal, which contained inclusion and exclusion criteria and the researcher's contact information. The researcher's contact information was distributed to willing participants who were interested in the study and who fit the inclusion criteria. When the researcher was contacted, the participants were then further screened against the inclusion and exclusion criteria and purposively selected for the purposes of the study. The participants who could not be recruited via the clinic manager were instead recruited via the snowball sampling methodology.

The participants who were willing to participate in the study and met the designated criteria were given a letter of information (see Appendices A1a, A1b, A2a and A2b), letter of consent (see Appendices B1 and B2) and the interview schedule (see Appendices D1a, D1b, D2a and D2b), depending on their preferred language, either English or isiZulu, by email or printed hard copy format. The interview was thereafter scheduled at the agreed-upon time according to the participant's preferred location or video call application, according to lockdown regulations.

3.10 Data collection tool

According to Longhurst (2003), a semi-structured interview is a conversational interview process with an exchange of the verbal mode of communication between the interviewer and interviewee. Olsen (2012) added that semi-structured interviews allow the participants to give personal accounts, state their experiences and perceptions, and voice their opinions on a given topic. McIntosh and Morse (2015) added that a semi-structured interview allows for information about a phenomenon to be explored when there is adequate objective knowledge but limited subjective knowledge. Additionally, the authors mention that in the semi-structured interview, there is room for flexibility in how the questions are asked. While questions are standardised and probing questions are asked, the researcher can also rephrase questions to derive important information according to the diversity of participants.

The research study used a semi-structured interview schedule to collect data (see Appendices D1a, D1b, D2a and D2b). A list of questions had to be formulated to enable the researcher to target each research objective and answer the research questions to construct the interview guide. Moreover, the biopsychosocial model acted as a

paradigmatic framework to guide the questions included in the interview (Bolton and Gillett 2019). The interview guide therefore included aspects related to how the physical and psychosocial aspects of the COVID-19 pandemic, affected patients with co-morbidities during the pandemic. Each question was thoughtfully formulated to gain insight and form a rich context for analysis, to not only understand but also derive recommendations for improving holistic well-being of people with co-morbidities. The interview questions gave the participants the opportunity to delve into their perspectives and experiences regarding how COVID-19 affected their mental and physical well-being while having a co-morbidity. The interview further allowed participants of the study to share their views, experiences and opinions about their family and social lives, how they received healthcare within the context of the COVID-19 pandemic, and how they achieved holistic health and maintained their well-being by using alternative therapies.

The interviews lasted approximately one hour. Two different interview schedules were formulated for each sample group, namely those affected by and those infected with COVID-19, in both English and isiZulu (see Appendices D1a, D1b, D2a and D2b). A research assistant was used to translate the interview schedules to isiZulu (see Appendices D2a and D2b). The research assistant is a homoeopath who has a master's degree and is familiar with research protocols and ethical considerations and is fluent in both English and isiZulu. A letter of information and consent was provided to the research assistant to maintain confidentiality (see Appendix A3 and B3). No participants requested to be interviewed in isiZulu.

3.11 Procedure for data collection

When a suitable candidate for the research study was found and volunteered to be interviewed, the researcher screened the participant against the inclusion and exclusion criteria to ensure eligibility for the study. The interview was scheduled at the time, location and convenience of the participant (DeJonckheere and Vaughn 2019). The participant was advised that the letter of consent (see Appendices B1 and B2) was to be signed before the actual interview began. The researcher also informed the participants that if at any point they decide to leave the interview or withdraw from the study, they may do so liberally and were assured that their information would not be used in the study, neither would they be penalised in any way.

Gubrium *et al.* (2012) detailed the importance of interview location requirements, highlighting the necessity for a convenient, safe and secure location in which the participant should feel comfortable. However with the advent of the COVID-19 pandemic, the researcher understood the need to further safeguard the participants' well-being and ensured their safety throughout the interview process with respect to the wearing of masks, maintaining a distance of 1.5 to 2m from the researcher, providing hand sanitisers and the room having good ventilation (Department of Health 2020). These COVID-19-related protocols were followed throughout the interview process. The interview venue was private to ensure confidentiality. Additionally, the chosen location was a quiet room in the clinic, which ensured quality audio recordings (DeJonckheere and Vaughn 2019).

DeJonckheere and Vaughn (2019) prioritised the importance of showcasing a friendly and respectful demeanour during the interview process, paying attention to non-verbal cues, actively listening to and showing interest in the participants. The researcher therefore applied these fundamental principles throughout his interactions with the participants. In qualitative interviews, prompting is allowed to elicit the maximum amount of information when the interviewee is not forthcoming with information (DeJonckheere and Vaughn 2019). Thus, probing questions were asked to ensure the richness of data from the participants.

As a means of co-operating with COVID-19-related restrictions and the national state of disaster imposed on South Africa, an alternative to the normal face-to-face interview process was put in place, namely video-call interviews. This clause allowed interviews to continue if COVID-19 restrictions did not allow face-to-face interviews, which also ensured the safety of the participants (Greeff 2020). The video-call interviews were intended to respect the participants' preferred mode of communication and their convenience, as well as adherence to lockdown regulations (DeJonckheere and Vaughn 2019).

Interviews

The interview length was approximately 45 minutes. A face-to-face interview required a quiet room and private space. Rapport was built with the participants while showing them

the utmost respect throughout the whole interview process (DeJonckheere and Vaughn 2019). A brief but properly presented explanation of the study was communicated to the participants. Further, an introduction to the research and the reasons for audio recording were presented to the participants before the start of the interview (DeJonckheere and Vaughn 2019). The recording device was checked before the start of the interview to ensure that it was working (Turner III and Daniel 2010). Field notes are of vital importance in qualitative research and are recommended to enhance data and provide a rich context for analysis; therefore, field notes, along with audio recordings, were used to ensure optimal rich information is garnered (Phillippi and Lauderdale 2018). Sixteen participants preferred to be interviewed at the Grove End Clinic; an amount of R50 was given to the participants for any travel expenses that they may have incurred.

The remaining ten participants opted for a video call interview due to COVID-19 infection risks and their reluctance to proceed with a face-to-face interview. Participants were advised to be in a location that they felt comfortable in, that was safe, secure and private. This was to ensure their safety and security as they were providing confidential information (Gubrium *et al.* 2012). The researcher contacted the participants and ensured that they had a suitable video call application installed. The participants did not require any funds for data. The researcher ensured that the recording device was working and that the medium for the video call was fully charged and fully operational. In this instance, a laptop was used. The researcher endeavoured to sit in a quiet and private setting for the purposes of clear audio recording and to maintain confidentiality (Turner III and Daniel 2010).

3.12 Data capturing and analysis

The cornerstone of a research study is to ascertain data that will allow the researcher to answer the research questions and achieve the research aim and objectives. Therefore, it is essential to ascertain, corroborate, capture and analyse the required data in a systematic manner that utilises established data analysis methodologies. An important step in this process is to effectively describe the processes to be followed. The data collection and analysis procedure in this study will engage the following protocols within a qualitative research design: data storage, transcription of data, thematic analysis, and

listing the phases for the application of this data interpretation and analysis tool applied in this research study.

3.12.1 Data storage

Initiating a research project involves the critical step of securing participant information and related data. This data can be in the form of audio recordings, field notes, video recordings, verbatim transcriptions and pictures (Barnhill and Barnhill 2015). The researcher ensured that the Durban University of Technology (2020) protocol for data storage was followed accurately. The participants of the research study, were informed of the following: how their data will be stored, the purpose of the collected data, who will own the recorded data, the various formats that data will be stored in, who will be able to access the data, who will own the data created during the course of the research, that the data will be stored for a period of five years after which it will be destroyed, and who will own the final results of the research.

The researcher has stored the data, both written and electronic, in a locked cabinet and all electronic data was backed up. The electronic data in the form of audio recordings was stored on an external hard drive with a pseudonym password. All data will be destroyed after a period of five years, according to DUT policy, the audio recordings will be deleted from the external hard drive and the written field notes and transcripts will be shredded.

3.12.2 Transcribing of data

Transcription is commonly employed in qualitative research when using interview schedules that involve audio recordings and is a direct translation of the audio recordings to the written text format. There are two essential methods of transcription to take note of. The naturalised and the denaturalised methods. The naturalised method of transcription uses an approach in which errors, sounds and mispronunciations are included in the written transcription. The latter omits these idiosyncrasies; as such, this entails including every sound, gesture, grammatical error, mistake, or other spoken error made by the participant in the written transcription (Oliver, Serovich and Mason 2005; McMullin 2021). Both systems of transcription are important. In the naturalised style of transcription, a lot of focus is given to the utterances of speech, which allows in-depth

analysis of conversational patterns. However, this can lead to difficulty in interpreting the gestures and expressions of the participants. The denaturalised style of transcription allows for a lower interest in the formalities of speech; rather, it aims to capture the essence and meaning of the interview, while also describing the perception attained. This style still aims to transcribe the interview verbatim without the excessive focus of speech styles (Oliver, Serovich and Mason 2005). Transcribing is a time-consuming process, as it involves many hours of listening to recordings and making sure all information is recorded accurately (Bailey 2008). Transcription is an essential process of audio-recorded interviews and should be done in a manner that best describes the entire interview with as much accuracy as possible.

A verbatim transcription was done according to established guidelines for qualitative research (McLellan, MacQueen and Neidig 2003). The denaturalised transcription method was used for this research study because it was more appropriate for the research aim and objectives. The focus of this thesis was to explore and understand the effect of COVID-19 on patients with co-morbidities, while looking at mental and physical health, social and family lives and the holistic well-being of the patients with co-morbidities. Therefore, while emotions relating to trauma played an important role in the interview process, emphasis needed to be placed in the domain of the substance and essence of the interview rather than attempting to interpret and explain speech patterns and gestures, as this leaves room for misinterpretation. The interviews were transcribed verbatim; however, excessive descriptions of expressions and unnecessary sounds, hand movements and facial expressions were not included as they did not emphasise necessity. DeJonckheere and Vaughn (2019: 1-8) stated that “after an interview, it is essential for the interviewer to begin to reflect on both the process and the content of the interview. During the actual interview, it can be difficult to take notes or begin reflecting”. Therefore, the process of reflection and recording thoughts from the interview were written as side notes. This will further enhance the richness of the data.

3.12.3 Thematic analysis

Thematic analysis (TA) is a widely used approach in qualitative research that allows for the formation of themes from patterns within data (Clarke, Braun and Hyafield 2015). Castleberry and Nolen (2018: 807-815) stated that ‘TA is a method of “identifying,

analysing and reporting patterns (themes) within data” ... TA of open-ended responses from surveys or transcribed interviews can explore the context of teaching and learning at a level of depth that quantitative analysis lacks while allowing flexibility and interpretation when analysing the data...’. There are two approaches, as outlined by Clarke, Braun and Hyafield (2015), to thematic analysis. The first approach is the Big Q or research that follows a qualitative method in which research subjectivity is regarded as useful. The other approach is the small q paradigm, in which an amalgamation between qualitative and quantitative research can be formed by using qualitative methodology in an acceptable manner according to quantitative approaches. The analysis of data in qualitative research is a complex interplay between the established data and the judgement and reasoning of the researcher, as the researcher becomes the instrument in the analysis process. Further, the researcher has an important responsibility in establishing trustworthiness in research.

Some advantageous uses of TA are the ease of adapting the methodology in each study, as the procedures of analysis are simple and few. TA is also a flexible methodology that can be adapted easily, and it maintains the richness of data while providing a comprehensive account of data. Additionally, the approach is useful when working with voluminous amounts of data that needs to be summarised in a systematic manner (Nowell *et al.* 2017). TA is largely beneficial in the qualitative paradigm and essentially forms the foundation of qualitative analysis. Individual themes in the TA are interconnected to the original dataset and share features of the data while being related to the research questions (Braun and Clarke 2006). TA is therefore a useful adaptive and flexible research tool that can be beneficial to a researcher in establishing themes in a summative manner that allows for the crux of the dataset to be established within themes.

3.12.4 Phases of thematic analysis

There are six phases of thematic analysis that are established which helps the researcher collate and analyse the results in the datasets to form themes. The phases of thematic analysis have been extracted from Clarke, Braun and Hyafield (2015):

Phase 1 (Familiarisation): The researcher needs to become accustomed to the data in this phase. The role of the researcher is to gain understanding and in-depth

knowledge of the data by reading and re-reading the transcripts from the audio recordings. The audio recordings need to be listened to and properly understood by the researcher. The field notes need to be read to understand any initial observations the researcher made during the interviews.

Phase 2 (Coding): Coding allows the researcher to establish specific labels and attach these labels to the applicable sections of the data. This process enables the researcher to categorise the dataset based on similarities and common patterns they share.

Phase 3 (Searching for themes): Here, the relevant codes are grouped together to represent patterns in the data. This process, in turn, enables the formation of themes.

Phase 4 (Reviewing themes): In this phase, the preliminary established themes are assessed for congruency with the dataset. This simple step allows the researcher to understand whether the essence of the dataset is represented within the themes. In this phase, the researcher can either make changes to the themes or scrap the theme and re-start from phase 3.

Phase 5 (Defining and naming themes): An important part of the thematic analysis process is to define the theme or provide a summary of the theme, while further giving the theme a name, which allows for clarity and ultimately a guide for the discussion.

Phase 6 (Writing the report): The last phase of the thematic analysis process allows the researcher to establish a discussion or narrative about the datasets through the formed themes. Finally, conclusions can be drawn based on all themes combined.

3.12.5 Adapting thematic analysis for this study

Thematic analysis was conducted according to the established guidelines and was adapted to this research study for the formation of specific themes.

Phase 1 (Familiarisation)

The researcher began the familiarisation process of the dataset through a verbatim transcription from the audio-recorded interviews. Thereafter, a rigorous reading of the dataset transcripts was conducted with further re-reading to gain a deeper understanding of the data by 'immersing' oneself in the data. The re-reading process was performed

until a good understanding of the data was ascertained. This process also entailed reading and understanding the observational field notes to gain a full picture of the data (Braun and Clarke 2006; Gareth *et al.* 2017).

Phase 2 (Coding)

The next phase entailed coding of the dataset, as Gareth *et al.* (2017: 17-36) wrote that: “coding is the systematic and thorough creation of meaningful labels attached to specific segments of the dataset...TA does not require the researcher to code every line of data”. The researcher began the process of coding by attaching key phrases to specific sections of the dataset to summarise a particular section. This process gave an encapsulated meaning that essentially provided the essence of the specific section of data.



Figure 3.2: A diagrammatic illustration of the coding process

The diagram displays the coding process and how this process followed a systematic manner.

Table 3.2 below shows an example of the coding process. This was extracted from sub-theme 5.1

Table 3.2: A table demonstrating the coding process

<i>"I was in a relationship at that time; it took a major strain on that relationship because we were not seeing each other. Not having that physical contact with your friends with your</i>	Troubles experienced in the realm of romantic relationships (social issues)	
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<i>family, your loved ones, your partner is very difficult.” [P25]</i>		The influence of the COVID-19 pandemic on social lives
<i>“At work, we socialise with each other on a regular basis and that just stopped completely and that was frustrating... I haven’t been to the movies ever since COVID.” [P17]</i>	Barricade to socialising (social issues)	
<i>“It was a little disappointing even then and up till now, I don’t get to see my family or friends.” [P26]</i>	Unable to meet with family and friends (social issues)	

The coding process effectively allowed for the coding of theme formation, from the common findings within the interviews.

Phase 3 (Searching for themes)

Phase three began the process of thematic development. The researcher kept in line with the topic of the research and built themes around the topic using the relevant data to actively formulate themes as well as refer to coded datasets and collate different similar coded datasets, while excluding irrelevant information (Braun and Clarke 2006; Gareth *et al.* 2017).

Phase 4 (Reviewing themes)

A preliminary finalisation of themes was conducted to assess, that properly formulated themes were created that encapsulated the essence of the dataset. Furthermore, this process ensured that a relationship between the topic and the dataset was evident (Braun and Clarke 2006).

Phase 5 (Defining and naming themes)

A definition of themes was conducted to give a narrative or description of the themes demonstrating well-established analysis and interpretation of the given themes. This

procedure allowed for an in-depth summary of the established themes and represented the rich datasets from the interviews in a concise manner that allowed simplicity for the discussion and reporting of the results (Gareth *et al.* 2017).

Phase 6 (Writing the report)

After all the themes were developed from both sample 1 and sample 2, the two samples were then analysed, and a discussion was formulated. This review and analysis provided an in-depth analysis of the results from the thematic analysis.

3.13 Trustworthiness

According to Connelly (2016: 435-436), the trustworthiness of a study is “confidence in data, interpretation and methods used to ensure the quality of a study”. To assess the trustworthiness of a research study, there need to be certain characteristic key components that the research fits into. The researcher ensured trustworthiness by ensuring that the appropriate research design was used to guide the study. Trustworthiness in research is also identified as the worthiness of the study that is able to influence the reader and draw attention to it (Nowell *et al.* 2017). Trustworthiness encompasses four important principles that fit into qualitative research: credibility, transferability, confirmability and dependability (Shenton 2004).

3.13.1 Credibility

Credibility is similar to validity in that the required protocols for the specific type of research are followed and are similar to key principles of other research studies conducted using that methodology (Connelly 2016). Korstjens and Moser (2018: 120-124) state that “credibility establishes whether the research findings represent plausible information drawn from the participants’ original data and are a correct interpretation of the participants’ original view”. This view is corroborated by Nowell *et al.* (2017) who identify credibility as the congruency between the participants’ responses and how the researcher represents these responses within the write-up.

Credibility is further encompassed by the congruency of the findings of a study with reality, which allows for the generated ideas of that study to share a relationship with each other. Credibility is also enhanced through a process of triangulation, in which

many established methodologies are used in a repetitive manner to characterise and identify patterns within the dataset. This triangulation process involves many procedures, such as methodological triangulation, data triangulation, investigator triangulation, theoretical triangulation and environmental triangulation (Stahl and King 2020). Credibility further encapsulates prolonged engagement, which allows for long engagement with participants and getting to know the datasets and persistent observations by reading and re-reading the data (Korstjens and Moser 2018). Participants achieve credibility by being genuinely involved and participating willingly in the study. Participants achieve this through non-coercion. Additionally, detailed narratives relating to the phenomenon under study, which can provide a rich context for analysis, are important (Shenton 2004).

The researcher followed the rigorous principles of qualitative research, encompassing thematic analysis, and conducted lengthy interviews to enhance the quality of the datasets. The researcher endeavoured to ensure credibility by making sure that the results yielded were derived accurately from the original datasets. Congruency between the original dataset was verified through member checking. The researcher also endeavoured to ensure credibility by providing detailed descriptions of the interviews through thematic analysis. Additionally, prolonged engagement was achieved by spending copious amounts of time accurately transcribing data from the audio recordings and checking and reading the transcripts.

3.13.2 Dependability

Dependability is an important aspect of trustworthiness in qualitative research that calls for the research findings to be consistent and reliable, where great lengths are taken to record the findings, which allows for third party researchers to follow and reproduce the research process (Moon *et al.* 2016). Dependability requires consistency or stability in following the chosen research methodology (Korstjens and Moser 2018). The dependability of research is further encapsulated by an auditing process that entails proper recording of interviews, field notes, transcription data and, most importantly, the issues and decisions around these challenges researchers might have faced. This process helps other researchers who succumb to similar roadblocks to refer to the audit trail and thereby overcome the challenges of their research. A well-documented and

clear audit trail gives the thesis or study dependability owing to the logical and systematic trail of events (Nowell *et al.* 2017). In the endeavour to attain dependability, the study methodology needs to be well written with the best proficiency and greatest detail so as to allow future researchers to replicate the study (Shenton 2004). In addition, the application of 'peer scrutiny' is important in achieving dependability, which entails allowing a peer to assess field notes and allow them to come to their own conclusions and understandings, which assists in the affirmation process in the interpretation of the interview observations (Stahl and King 2020).

The researcher strived to follow the principles of the chosen research methodology, which is qualitative research, non-probability sampling and thematic analysis. This ensured that the research findings were reliable for other researchers to follow. By writing detailed accounts of challenges faced and issues around the chosen methodologies, the researcher displayed the dependability of the research study. This detailed audit trail exemplified dependability and gave clear information to other researchers. The methodology section of this thesis was written in detail with clear and appropriate descriptions of the procedures followed to allow replicability of the study design. Further, the research field notes were reviewed by the supervisor and co-supervisor, which allowed more conclusions to be drawn.

3.13.3 Transferability

Transferability refers to the ability of the study to be useful in other settings or locations (Connelly 2016). Transferability also refers to the generalizability of a study in that it can be adaptable or extrapolated to other locations (Elo *et al.* 2014). Korstjens and Moser (2018) emphasise that the researcher should provide good descriptions of the research process, which will enable the reader to gauge applicability in their given setting, as the researcher may not know the setting where the study will be reproduced. The provision of a thick description is necessary in the narrative by the researcher because it enables the research to be replicable and reproducible by other researchers in other locations. Factors that influence the transferability of the study are the timeframes for data collection and the methodologies for the data collection (Stahl and King 2020). However, despite the need for transferability in qualitative research, it is noted that transferability is almost impossible as each study is unique with the inclusion of a small sample group

and limited locations (Shenton 2004). But detailed descriptions and systematic approaches assist in maintaining transferability (Slevin and Sines 1999).

The researcher endeavoured to provide the best possible descriptions of the research design and research methodologies to allow for possible transferability to other research sites or locations. This further enhanced the transferability of this study, as it allowed replicability and reproducibility. The researcher maintained excellent descriptions of data collection timeframes and kept a proper audit trail to ensure transferability.

3.13.4 Confirmability

Confirmability refers to neutrality or producing unbiased research findings (Korstjens and Moser 2018). Further, the confirmability of a research study is defined by the objectivity of the researcher. The concern around confirmability is dependent on whether the research findings are directly derived from the participants of the study or whether the research findings are influenced by the researcher. Thus to eliminate the possibility of researcher bias, it is essential to employ triangulation methods, provide detailed descriptions of research methodologies, and leave behind an audit trail (Shenton 2004). Additionally, in the attempt to eradicate researcher bias, the researcher must endeavour to maintain that all interpretations and conclusions drawn must not emanate from the researcher's own ideas. Therefore, ensuring that credibility, dependability and transferability are achieved will help in achieving confirmability. The use of an audit trail largely assists in maintaining confirmability, as any decisions regarding methodology should be recorded (Nowell *et al.* 2017).

The researcher ensured confirmability by having a useful audit trail, which is when the researcher records in detail how the research methodology of a study occurred, that includes all relevant processes in producing the results of a study (Carcary 2020). The researcher endeavoured to remain unbiased and objective while ensuring that research findings are aligned to the descriptions given by the participants and not by the researcher. A thick description of the research methodologies and decisions made was provided to ensure confirmability.

3.14 Ethical considerations

The researcher received full ethical clearance from the Institutional Research Ethics Committee (IREC) at the Durban University of Technology. The ethical clearance number is **232/21**. The researcher followed strictly the research guidelines as stipulated by the IREC. The researcher further ensured that ethical principles were followed with regards to informed consent, voluntary participation, anonymity and confidentiality (Arifin 2018). Further core principles of beneficence, non-maleficence and justice were also taken into consideration (Schröder-Bäck *et al.* 2014). The researcher declares that there is no conflict of interest.

3.14.1 Informed consent and voluntary participation

The act of informed voluntary consent is of absolute importance in any research study involving human participants, as autonomy is a basic human right (Schröder-Bäck *et al.* 2014). Informed consent entails the voluntary participation of a participant after having been made fully aware of the full scope of a study, including all risks and benefits that are intended for the participant. The process of informed consent is aptly important, as a participant needs to be given enough time to decide on their participation without the influence of any coercion (Manti and Licari 2018). According to Nijhawan *et al.* (2013), certain criteria need to be met to attain informed consent. The letter of information must contain the following important details: a statement informing the participant that research will be involved, the purpose of the research study, how long participants will be needed, details on procedures involved in the study, potential risks to the participants, benefits intended for the participant, confidentiality of data, research-related injury, any monetary remuneration for the participants, contact information of the researcher and supervisors, including the host institution's contact details and information on voluntary consent with the freedom to drop out of the study at any time. There is great concern regarding informed consent relating to vulnerable groups. These are usually people who are physically, psychologically and socio-economically vulnerable. Therefore, it should be in the interest of every researcher to never exploit the vulnerability of any person (Manti and Licari 2018).

The letter of information is an important aspect of this study, as it will include human participants. The participants, in this study, were made fully aware of the scope of the

study through a letter of information (see Appendices A1a, A1b, A2a and A2b). Informed voluntary consent is vital in research involving participants, and therefore, they were given detailed information about the research study. This was done in accordance with the guidelines mentioned, which allowed participants to make an informed decision when either accepting or declining to participate. Participants were informed of their option to withdraw from the study at any time. The participants were not coerced in any way and they were respected accordingly. In addition, participants were asked to sign a consent form (see Appendices B1 and B3). In keeping with the guidelines for informed consent, both the letter of information and the consent form were written in English and isiZulu for preference of language. The manager of the clinic served as the key person involved in for the recruitment of the participants. When patients had agreed to be interviewed, then only was informed consent obtained, prior to the interviews. The participants were given a choice of when to conduct interviews and they signed the informed consent when they were ready. All participants in this study were literate.

3.14.2 Confidentiality

Confidentiality is an important practice in qualitative research, to ensure ethical principles are met while ensuring the anonymity of participants. This principle calls for the researcher to safeguard the identities of the participants in a study by using pseudonyms to mask their identities. Furthermore, any information disclosed during the interviews is concealed to prevent readers from identifying the participants (Allen 2017). Confidentiality of participants' data can be achieved by splitting their identities from their information shared using pseudonym codes and by further securing the code linkages. Additionally, if a transcriber is used, then the transcriber must ensure that s/he maintains the confidentiality of the data by not sharing any of the participant's data with others (Wiles *et al.* 2006). Trust plays a large role in guaranteeing the participant that the information shared during the interviews will be confidential. Trust allows the participants to put their trust in the researcher and believing that ethical principles will be followed through. Further informed consent safeguards confidentiality by making the participants fully aware of the scope of the study and their voluntary participation with the choice to withdraw from the study. This fundamentally respects their human rights (Bos 2020). Confidentiality is of utmost importance as it gives potential participants the confidence that their information is secure and anonymous. Further, it provides participants peace

of mind that any embarrassing or private issues are dealt with correctly and are not shared with the public. This assures participants that their privacy will be safeguarded and will therefore expedite recruitment (Allen 2017).

The researcher achieved the ethical principle of confidentiality in this doctoral study by using a pseudonym code instead of participants' names in the report. No information linking the participants' names to the codes was recorded in the final report. The researcher understood the vulnerability of the participants in that they shared personal and traumatic events in their battles with COVID-19. This motivated the researcher to respect the confidentiality of the participants in this research study. Participants were assured that DUT guidelines for data storage were followed (Durban University of Technology 2020) and their information would be stored with password protection on an external hard drive. Further, any field notes and transcribed data, together with the hard drive, would be stored away in a locked cabinet.

3.14.3 Beneficence

The principle of beneficence is tightly connected to altruism because it involves concern for the well-being of others. Beneficence is the ethical principle that encompasses the need to benefit others. In research, this is essentially important as the benefits of a study should greatly outweigh any risks (Pieper and Thomson 2016). This principle further encapsulates the requirement to protect and preserve the human rights of participants and to intend goodness and kindness towards the participants (Varkey 2021). Additionally, the act of beneficence should do greater good for the participants and the community at large (Pieper and Thomson 2016).

The researcher applied the concept of beneficence to this research study by affirming the benefits of the study. This study aimed to give people the opportunity to share their experiences with COVID-19 while having a co-morbidity. This allowed access into patients' lives, which gave insight into how the pandemic has affected people on a mental emotional level and physical level. Furthermore, this new information shared by participants enhanced the sparse information on the topic, which, in-turn, grew the armamentarium of knowledge in the field of health research. Both the local and international community can benefit from the findings of this study, as the information

garnered from this study facilitated the write-up of recommendations for improving holistic health and well-being in these persons with co-morbidities.

3.14.4 Non-maleficence

The non-maleficence principle is fundamentally a concept of 'do no harm'. This important ethical principle intends that participants should not be subjected to any direct harm and that they should not be offended (Varkey 2021). According to Tuckett (2000), non-maleficence can also be viewed as a prohibition of harm rather than an action to prevent harm. Minimising risk is a necessity in any research, while intending no known unfavourable effects on the participants. Additionally, the participants should not be exploited in any manner or form (Avasthi *et al.* 2013).

The researcher intended no harm to the participants. Further, there was no intended risk to any patient. However, due to the emotional nature of the interview process in relation to the current COVID-19 pandemic, the interview questions may evoke emotions of sadness and grief. You need to clarify this point.

If a patient experienced any mental and emotional trauma during the interviews when they re-lived their experiences with COVID-19 they would be referred to the Grove End Clinic counsellors for counselling. No participant required trauma counselling. The participants were not exposed to any form of deception throughout the research process.

3.14.5 Justice

The principle of justice in ethics, intertwined with the concept of respect for individuals plays an important role in research studies involving participants. In such studies, participants are chosen based on research purposes and are not discriminated against (Pratt *et al.* 2020). Justice is additionally perceived as being fair and equitable towards participants (Varkey 2021). Justice for the vulnerable is of particular importance in research ethics. Vulnerable populations, such as children, the sick, geriatric patients and the mentally challenged, need to be identified. A researcher should never try to exploit these vulnerable groups for ease of recruitment (Orb, Eisenhauer and Wynaden 2001).

The principle of justice was applied to this study with the researcher being cognisant of the vulnerability of patients, especially since they were either infected or affected by

COVID-19 while having a co-morbidity. The researcher understood that people might have faced possible trauma and could still be mentally or emotionally scarred by these events. The researcher was impartial and did not discriminate against any participant while giving equal opportunity to people joining the study based on the inclusion and exclusion criteria as well as the participant number requirement which was 16 participants, that expanded to 26 participants after snowball sampling.

3.15 Summary of the chapter

This chapter covered the research methodologies that were used to establish guidelines for achieving the research objectives and answering the research questions. The important aspects of this chapter, including the research design, the researcher's role and reflexivity, the study setting, the study population and sample, the sampling strategies used, the inclusion and exclusion criteria, the recruitment process, the data collection tool, the procedure for data collection, data capture and analysis, trustworthiness and ethical considerations, were addressed. The research methodologies aided the researcher in showcasing the exact process that was followed to establish a proper design, which would allow other researchers the opportunity to reproduce this study in other settings for further research.

CHAPTER 4: RESEARCH RESULTS, ANALYSIS AND DISCUSSION

4.1 Introduction

This chapter aims to analyse and interpret the data collected from participants in the research study. It encompasses a comprehensive discussion of the themes and sub-themes, endeavouring to establish connections between the collected data and existing literature through a thorough narrative and analysis. The data was processed using thematic analysis. Therefore, all the data was categorised according to themes and sub-themes in relation to their similar characteristics. The thematic analysis process thereby yielded eight themes with their respective sub-themes as follows:

- (1) *The effect of COVID-19 on the physical health of people with co-morbidities.*
- (2) *The effect of COVID-19 on the mental health of people with co-morbidities.*
- (3) *The economic circumstances during the COVID-19 pandemic and its effects on livelihood.*
- (4) *Outline of the influence of the community during heightened periods of tribulation.*
- (5) *Social life during the pandemic.*
- (6) *The role of family and loved ones in times of adversity.*
- (7) *Healthcare during the COVID-19 pandemic.*
- (8) *Faith and spirituality.*

The themes and sub-themes are illustrated in Table 4.2. All themes are inter-connected, as an individual's experiences during the COVID-19 pandemic were related to multiple factors. Therefore, the various themes must be viewed through a holistic lens considering the multifaceted and inter-connected nature of individuals' experiences.

This chapter contains a discussion of the themes and sub-themes. The discussion endeavoured to compare the data with existing literature by giving a complete narrative and analysis of the data.

4.2 Demographics of research participants

There are two groups within the context of this study. These two groups are patients affected by COVID-19 with a co-morbidity and those infected by COVID-19 post three months with a co-morbidity. The data is presented holistically for both groups. Table 4.1 that follows identifies the demographics of participants.

4.2.1 Participants' demographics

The participant's details have been anonymised and a pseudonym was assigned to each participant for ease of reference. Table 4.1 below, illustrates the pseudonym attached per participant with the gender and co-morbidity of each participant in the study. All participants were of the Indian race group. Participant demographics are important to provide context for the sample of the population under study (Parsons *et al.* 2024).

Table 4.1: Demographics of the affected and post-infected participants

Research participant	Gender	Co-morbidity
Affected		
P01	Male	Diabetes and hypercholesterolaemia
P02	Female	Diabetes and asthma
P03	Male	Diabetes and hypertension
P04	Male	hypercholesterolaemia
P05	Male	Diabetes and hypercholesterolaemia
P06	Male	Diabetes, hypercholesterolaemia, hypertension and tuberculosis
P07	Male	Hypertension and hypercholesterolaemia
P08	Male	Diabetes, hypertension and stroke/CVA
Post-infected		
P09	Female	Hypertension and hypercholesterolaemia

P10	Male	Diabetes, hypertension and hypercholesterolaemia
P11	Female	Hypertension and diabetes
P12	Male	Diabetes
P13	Female	Hypertension and hypercholesterolaemia
P14	Male	Hypertension and diabetes
P15	Male	Diabetes
P16	Female	Asthma
P17	Female	Polycystic ovarian syndrome, hypertension, hypothyroidism and diabetes
P18	Female	Rheumatoid arthritis
P19	Female	Polycystic ovarian syndrome and insulin resistant
P20	Male	Allergic rhinitis
P21	Female	Hypertension
P22	Male	Hypertension and diabetes
P23	Female	Hypertension and hypothyroidism
P24	Male	Hypertension and hypothyroidism
P25	Female	Polycythaemia vera
P26	Male	Allergic rhinitis and sleep apnoea

4.2.2 Common co-morbidities among the research participants

As part of the recruitment criteria participants had to have at least one or more co-morbidity. The distribution of co-morbidities showed a large amount of lifestyle related diseases among the participants. In addition, there were respiratory related diseases, metabolic diseases, genetic diseases and autoimmune diseases. The number of co-morbidities among the sample were:

- *Hypertension (14)*
- *Diabetes (12)*

- *Hypercholesterolaemia (8)*
- *Asthma (2)*
- *Tuberculosis (1)*
- *Stroke/CVA (1)*
- *Allergic rhinitis (2)*
- *Polycystic ovarian syndrome (1)*
- *Rheumatoid arthritis (1)*
- *Sleep apnoea (1)*
- *Polycythaemia vera (1)*
- *Hypothyroidism (1)*

4.3 Overview of themes and sub-themes

An overview of the themes and sub-themes were tabulated for both groups holistically in Table 4.2.

Table 4 2: Themes and sub-themes among participants affected by COVID-19 and infected with COVID-19 post three months, with a co-morbidity.

Theme	Sub-theme
1.The effect of COVID-19 on the physical health of people with co-morbidities.	1.1 The intensity of COVID-19 symptoms during the active infection period. 1.2 Long-COVID and its implications for physical well-being. 1.3 The effect of the pandemic on lifestyle and the alteration of lifestyles to establish good physical well-being.
2. The effect of COVID-19 on the mental health of people with co-morbidities.	2.1 Stressors caused by the COVID-19 pandemic. 2.2 Mental trauma as seen through post-traumatic stress. 2.3 Fears and anxiety during the COVID-19 pandemic 2.4 The isolation and its influence on mental well-being. 2.5 Feelings of helplessness and hopelessness.

	2.6 The implications of negative mental well-being.
3. The economic circumstances during the COVID-19 pandemic and its effects on livelihood.	3.1 Unemployment and decreased working hours. 3.2 The effects of the socio-economic decline. 3.3 Transport difficulties.
4. Outlining the influence of the community during heightened periods of tribulation.	4.1 Breaking COVID-19 protocols 4.2 Heightened sense of unity within the community. 4.3 The humanitarian role of the community and religious organisations.
5. Social life during the pandemic.	5.1 The influence of the COVID-19 pandemic on social lives. 5.2. Understanding how the COVID-19 pandemic has re-defined social norms.
6. The role of family and loved ones in times of adversity.	6.1 Understanding how the lockdown affected family bonding and relationships. 6.2 Family conflict. 6.3 Activities within the home during the lockdown. 6.4 Family and friends as a support structure. 6.5 Caring for loved ones. 6.6 Bereavement during the COVID-19 pandemic.
7. Healthcare during the COVID-19 pandemic.	7.1 The experiences of patients at healthcare facilities. 7.2 The challenges of patients obtaining medication during the lockdown period. 7.3 Perspectives revolving around vaccination against SARS-CoV-2. 7.4 Holistic treatment and therapies for COVID-19.
8. Faith and Spirituality.	8.1 Understanding how the lockdown restrictions impeded people's ability to attend religious gatherings. 8.2 The influence of faith and spirituality during periods of hardship. 8.3 Resilience 8.4 Lessons learned from the pandemic that promulgated a new outlook on life.

4.4 Thematic analysis with themes and sub-themes

The thematic analysis process yielded eight main themes with their respective sub-themes. The excerpts pertaining to each theme and sub-theme are outlined below.

4.4.1 Theme 1: The effect of COVID-19 on the physical health of people with co-morbidities

Theme 1 focussed on the effect that COVID-19 had on the physical well-being of patients with co-morbidities. The sub-themes included:

- The intensity of COVID-19 symptoms during the active infection period;
- Long-COVID and its implications on well-being; and
- The effect of the pandemic on lifestyle and the alteration of lifestyles to establish good physical well-being.

The sub-themes that follow encapsulate the various factors that influenced the physical health and well-being of patients with co-morbidities. Participants mentioned that COVID-19 had affected their physical health and well-being, as follows:

“Physical health—I would say it affected me drastically. Because I did have COVID twice.” [P16]

One participant narrated that COVID-19 had affected his/her ability to perform tasks adequately in comparison to the pre-COVID period. The participant said:

“Physically, we couldn’t do what we used to do as before. Like my housework is not the same... I’m gone very slow at it. Very slow; it’s not the same.” [P11]

The data indicated that patients’ physical health was negatively affected by COVID-19. They described the various influences that affected their general physical health, such as their ability to perform tasks being more difficult than before.

SARS-CoV-2 caused a significant health crisis on a global scale and within the confines of South Africa. The literature indicated a considerable impact on the physical health of individuals who have co-morbidities (Ye *et al.* 2020; Zádori *et al.* 2020). Co-morbidities are a major concern for both the international and South African communities. Co-

morbidities are known to be both communicable and non-communicable in nature and pose a significant strain on people's lives (Anderson and Durstine 2019). Further, the South African healthcare system faced unprecedented difficulties in its ability to cope with the volume of patients with chronic diseases. These chronic diseases not only posed great risks to the health of the patients but also impacted the fragile healthcare system and the economy (Modjadji 2021). This was significant as the literature suggested that co-morbidities make people more vulnerable to COVID-19 infections (Baradaran et al. 2020). The sub-themes pertaining to this theme explored the various aspects of how the physical health of people with co-morbidities was affected during the COVID-19 pandemic.

4.4.1.1 Sub-theme 1.1: The intensity of COVID-19 symptoms during the active infection period

This sub-theme explored the intensity of symptoms that patients who were infected with SARS-CoV-2 had experienced. This sub-theme pertained to participants in sample 2, who were infected by SARS-CoV-2. The presence of a chronic disease seemed to have resulted in heightened symptoms. Participants shared how the presence of their co-morbidity could have affected their ability to cope with the SARS-CoV-2 infection. They said:

"I think because I was a chronic patient, it [COVID-19] took a toll on me longer than them [friends]... It was my ability to cope that was low... Basically, it was like a flu, but I was getting much more severe pains, like my whole body was just throbbing." [P12]

This decreased ability to cope was re-iterated by a patient with rheumatoid arthritis.

"I had COVID and with my situation [having rheumatoid arthritis], it was not treating me well at all. Like I had chest pains, body pains and I only wanted to sleep. No pain medication was helping me... I was lethargic, all I wanted to do was sleep. The body pain was so bad, like if you fall down and break a couple of your bones." [P18]

“I didn’t imagine the backache will be as bad.” [P13]

In addition to increased pain, patients also reported difficulty with breathing, which was not experienced before.

“I was very sick; I’ve never had such a fever before and the tightness of the chest. I’ve never been nebulised before; well, now I’ve been nebulised like twice a day.” [P23]

These participants highlighted their experiences while they were infected with the virus. Having a co-morbidity affected coping mechanisms regarding how the pathophysiology of the virus played out. There was an intensification of symptoms, which could have been the result of an interaction between their chronic diseases and SARS-CoV-2. This interaction appeared to amplify their co-morbidity and caused the severity of symptoms such as intense body pains, fever, chest tightness and lethargy.

An insurmountable volume of evidence shows that the interaction between COVID-19 and communicable and non-communicable diseases most often leads to a poor prognosis (Adepoju 2020; Ye *et al.* 2020; Zádori *et al.* 2020; Egede *et al.* 2021). Conditions like cardiovascular diseases, diabetes, asthma and other lifestyle-related chronic diseases such as hypercholesterolaemia are among the highest risk factors for deteriorative health while infected by SARS-CoV-2 (Arumugam *et al.* 2020). Alyammahi *et al.* (2021) conducted a literature review of the molecular causes of disease severity in patients with co-morbidities and concurrent COVID-19 infection. These authors noted that one of the main causes of disease severity in patients with chronic illnesses was the expression of ACE2 receptors on organs like the lungs, heart and pancreas and the affinity of SARS-CoV-2 to these receptors. Further, they mentioned the cytokine storms and degradation of normal physiological processes once infected with the virus.

Participants in this study complained of severe bodily pain. A study by Lippi, Wong and Henry (2020) that consisted of a pooled analysis involving 2445 COVID-19 patients found that only 445 patients had experienced myalgias. They further noted that only 125 patients experienced severe COVID-19 and the remaining 296 patients did not have severe COVID-19, therefore indicating that myalgia is not a risk factor for severe COVID-19.

Participants also noted that their co-morbidities deteriorated while infected by SARS-CoV-2. Participant 12 shared how they were diagnosed with diabetes before contracting COVID-19; however, once they became infected the virus aggravated their diabetes symptoms. He said:

“I came to the clinic because I was just having dizziness all the time. So, that’s when I found out that I was a chronic patient. But until I got the COVID, when I’m doing the tests it’s like 22 [glucose reading]. My body is numb I can’t move my hands or my legs at times. COVID and the chronic disease did some damage of some sort.” [P12]

A hypertensive participant noted that her blood pressure was elevated while having COVID-19.

“I can’t really tell if COVID has affected my chronic condition. I would say at that time, yes. My blood pressure was elevated, you know, during COVID... and the coughing also elevates your blood pressure.” [P13]

While infected with the virus, participants 12 and 13 experienced exacerbations of their chronic diseases. This was due to an interaction between the diseases, namely COVID-19, hypertension and diabetes. Participant 12 mentioned that the SARS-CoV-2 infection had worsened his diabetes symptoms, despite his diabetes being relatively manageable prior to the infection. Similarly, Participant 13 attributed their higher-than-normal blood pressure to the virus.

Steenblock *et al.* (2022) suggested that COVID-19 may have a clinically worse pathophysiology in someone who is diabetic because diabetics normally have low-grade inflammation due to suppression of anti-inflammatory cytokines and an increase in the cytokines that promote inflammation, which can lead to insulin resistance. They suggested that the presence of SARS-CoV-2 may further amplify this process, leading to more severe inflammation and increasing insulin resistance. Further, it was noted that the beta cells on the pancreas can become infected by SARS-CoV-2, resulting in injury to these cells, which amplifies insulin resistance. This then results in hyperglycaemia, a

worsening of diabetes and the eventual deterioration of the health of the infected individual. Further research by Peric and Stulnig (2020) concurred with the aforementioned observations and additionally noted that concurrent infection with SARS-CoV-2 and diabetes creates a clinically worse prognosis and death. This can include the need for intensive care and ventilation.

A cohort study by Akpek (2022) involving 153 patients admitted to a hospital in Turkey with COVID-19 found that COVID-19 can increase both systolic and diastolic pressure. Tadic *et al.* (2020a) conducted a review assessing how COVID-19 and hypertension interacted and provided an explanation for how COVID-19 can exacerbate hypertension. They found that since SARS-CoV-2 binds to ACE-2 in the heart, there is a higher level of angiotensin II which can lead to vasoconstriction and sodium retention that eventually elevates blood pressure. The literature also showed that hypertensive patients reported higher blood pressure readings in otherwise controlled conditions. This can be due to medication non-compliance, stress or physical inactivity (Laffin *et al.* 2022).

One participant showed injuries sustained due to severe COVID-19 symptoms. A diabetic and hypertensive participant had reported that he had injured two intervertebral discs after fainting during a coughing spell. He said:

“I had a very bad cough. Every time I coughed, I used to feel like dizzy. So, at one stage, I coughed so badly that I collapsed. I collapsed and I hurt my neck. I was in so much pain in my neck... I hurt two discs in my neck, so they booked me for an operation.” [P10]

The data reflected that the severity of COVID-19 symptoms had caused the participant to have a fall-related injury during the period of infection by the virus. The severe cough brought about by the virus caused him to faint and ultimately sustain an injury. The symptom of syncope reflected findings in existing literature, indication that patients with diabetes and cardiovascular diseases present with an increased risk of experiencing syncope. According to Baker *et al.* (2021: 2), some of the mechanisms involved in this process are:

- “1) Impaired blood pressure sensing;
- 2) Impaired initiation of autonomic efferent responses to blood pressure reductions (i.e., cardiovagal withdrawal, sympathetic activation);

- 3) Impaired target organ responsiveness to autonomic efferent activity; and/or
- 4) Overwhelming vasodilation”.

They further noted that there is no direct link to these mechanisms in COVID-19. Therefore, COVID-19 cannot be implicated as the cause of syncope. A US study consisting of a sample size of 2006 adult participants by Hoffman *et al.* (2022) interestingly found that the number of fall-related injuries was high during the lockdown periods, as 741 of the participants reported falls. Cough syncope is a well-known process in which individuals lose consciousness when coughing, it was noted that cough syncope can occur independently of co-morbidities (Sheikh 2020). Therefore, it is difficult to pinpoint the exact mechanism of their syncope and related injuries.

Sheikh (2020) speculated that a cough could cause high pressure within the thorax, leading to low cardiac output and thereafter low blood supply to the brain, leading to syncope. Baker *et al.* (2021) provided a review and showed that hypoxemia or low blood oxygen saturation can occur during COVID-19 infection, which could cause syncope. Further, they purported that the use of antihypertensive drugs can cause syncope. They additionally illustrated that the use of antihypertensives, together with the presence of COVID-19, can exacerbate syncope.

The COVID-19 infection also resulted in several patients becoming critically ill and ultimately having to be hospitalised to ensure their well-being. They said:

“They [doctors] wanted me to breathe and that balloon had to go up to 100. Every time, I tried to blow into that to open up my lungs, I couldn’t do it... I think because of that, I must have gone unconscious the next day... I went to ICU after the first day because I fell into a coma for one week. When I woke up, I wasn’t speaking properly.” [P21]

“I started sweating; I was feeling like I was going to collapse; I’m feeling very weak. So, I went to the hospital... I couldn’t feel my legs; I was losing feeling all over, like my body was going [into] shutdown mode.” [P20]

The data showed that participants became critically ill from being infected with the virus. The severity of the symptoms is thought to be due to these patients having a co-

morbidity. Participant 21, who is a hypertensive patient, had experienced major issues with her respiratory system and ultimately had decreased lung function. Her ability to breathe became increasingly difficult, and she attributed this to her becoming comatose and getting admitted to the ICU. Participant 20 described the traumatic events that led to him seeking hospital care, as he experienced a rapid deterioration in his physical well-being due to SARS-CoV-2. The data provided increasing knowledge depicting how severe COVID-19 can be in those that are immunocompromised from a co-morbidity, which led to them seeking hospital care and intensive care.

An Egyptian observational cohort study by Khedr *et al.* (2022) that included a sample size of 439 hospitalised patients observed that 61.7% of the sample had a chronic condition, namely hypertension and diabetes. Their study noted that these patients presented with fever and lower respiratory tract (LRT) symptoms. The LRT symptoms were predominantly higher in those patients with co-morbidities. Additionally, their study found that 35.8% of the patients with co-morbidities were admitted to the ICU. This was similar to one of the participants who required admission to the ICU. Another cohort study by Zaenab *et al.* (2021), including 271 patients in California, USA, indicated that hypertension was one of the major chronic diseases in those patients that were hospitalised. Those hypertensive patients admitted to the ICU had a longer stay and required mechanical ventilation. Hypertensive patients also had a higher mortality rate.

4.4.1.2 Sub-theme 1.2: Long-COVID and its implications on physical well-being

This sub-theme explored the effects of long-COVID which is essentially described as persistent symptoms after the period of infection by SARS-CoV-2. The participants of the current study were asked to reflect on their experiences after their infection period. The data showed that many participants who were previously infected by the virus had a difficult journey to recovery. A feeling of intense fatigue or tiredness persisted post-COVID. The participants said:

“I think you don’t have energy, it goes, not as good as it should be... everybody tells me I’m so great. But I don’t know, after the COVID there was not a lot of energy. But I think I’m coming back to normal now” [P09]

“Well, my pace is a little slower. Little slowed down, not like how it was.” [P14]

A mother described how her energy levels had decreased in comparison to pre-pandemic times. This suggests that the virus had affected her stamina and resulted in fatigue after short periods of activity. She said:

“I get so tired, so I run around with my son for 20 minutes, and then I need to sit down and me being somebody under the age of 35... I struggle, I literally struggle.” [P16]

Another participant with polycythemia vera described how her chronic ailment, had affected her physical health, causing fatigue. However, SARS-CoV-2 has only served to compound these issues and cause greater levels of fatigue. She narrated as follows:

“The fatigue, the lethargic feeling that you get. Because I do have a high platelet count because of my condition and that gives me fatigue. It makes me feel lethargic and I feel like after COVID like it just added on. Just made it worse.” [P25]

The aforementioned excerpts reflected how fatigue related to COVID-19 and caused a strain on the daily functioning of the participants. It was apparent that this fatigue and loss of energy were caused by COVID-19. There was mention of how participants were not able to do the things they loved anymore due to the intense exhaustion. The usual tasks and normal daily activities became a struggle for them. The pre-existing conditions in the patients, therefore, could have contributed to their recovery period becoming difficult and prolonged. Participant 25 also alluded to the fact that her co-morbidity itself caused her to feel tired, but the combination of COVID-19 added to the fatigue. There was an indication that age did not play a role in determining energy levels, as both younger and older participants experienced the same intense fatigue.

This evidence from the data matched established literature. A South African cohort study found that out of 1873 participants who were hospitalised, the most common long-COVID symptom reported was fatigue, which accounted for 50.3% of the total participants. The presence of a co-morbidity was a risk factor for long-COVID fatigue

(Dryden *et al.* 2022a). Further, a systematic review that collated articles from 12 different high-income countries, exhibited symptoms of weakness and general malaise to be prominent. Age and co-morbidity were risk factors for long-COVID (Michelen *et al.* 2021). Another study illustrated that even those patients who had mild or asymptomatic illness from COVID-19 are at risk of developing long-COVID symptoms with one the major symptoms being fatigue. The writer made note of the term post-SARS-CoV-2 viral syndrome, indicating that post-acute COVID-19 can result in chronic fatigue syndrome (CFS) and exhaustion (Outhoff 2020). The intense levels of inflammation and decreased reduction in inflammation post illness from the COVID-19 infection could be the cause of persistent long-COVID symptoms, namely fatigue (Campos *et al.* 2022).

A further complication that was evident was that of memory loss or brain fog as a result of COVID-19. Participants mentioned their daily struggles from having these experiences and how they affected their ability to function. They reported:

“The memory loss and, like basically, I don’t even know what happened in the morning leave alone yesterday. During the same day, it’s hard for me to recall what happened in the day, so it has taken a toll on me even in jobs as well.”
[P12]

“Brain fog and memory loss was one of the major things that happened. I still have brain fog. I’m even taking these IQ vitamins that I saw somebody else taking in our working environment and my brain fog is very bad. My memory is very bad, even trying to concentrate, even if it’s at church my concentration is so bad.” [P16]

Another participant described the significant memory loss she experienced, since contracting SARS-CoV-2. She became forgetful and had to write down notes to remember tasks. She said:

“I feel like ever since I had COVID, my memory hasn’t been what it was. I do tend to have a much shorter memory span ever since COVID. Example: If I’m told to do something and if I don’t write it down, then I would completely blank out.” [P19]

The aforementioned excerpts reflect symptoms of memory loss or brain fog. Memory loss was intense, as there was a complete lack of recall of the day's events. The memory loss was a considerable challenge, as those struggling with it experienced difficulties at work. Brain fog was also another problematic condition that affected the minds of the patients because the usual ordinary activities that people performed without thinking about became difficult for them. There was confusion, which even led to a lack of concentration. The use of supplements did not ensure a resolution of their brain fog and memory loss. There is clear evidence of long-COVID-19 symptoms that persisted after the infection from the virus cleared. This interrupted the lives and daily activities of individuals significantly. These symptoms impeded the individual's ability to lead normal lives and caused them to become frustrated.

The symptoms of memory loss and a lack of concentration were evident in the literature as well, as mentioned by Outhoff (2020) in a review of studies. Patients with long-COVID presented with persistent symptoms of a lack of concentration and memory problems. Additionally, the author mentioned that these symptoms can persist, especially in patients with co-morbidities. A report from the Indiana University School of Medicine observed that 924 respondents out of a survey of 1 567 respondents who previously had COVID-19, reported difficulty in concentration, and 714 respondents reported memory problems (Lambert 2020). A systematic review and meta-analysis by Chen *et al.* (2022a) showed that having a co-morbidity was a risk factor for developing post-COVID symptoms such as memory loss. Furthermore, the authors noted that fatigue and memory loss were the most enduring and common symptoms after the COVID-19 infection.

Visco *et al.* (2022) conducted a review of the literature and indicated that brain involvement from SARS-CoV-2 is the main reason for neurological or cognitive problems. They noted that brain inflammation was a contributor, as it allowed white blood cells to cross the blood-brain barrier. Additionally, it can occur through direct injury to brain tissue by the virus. They further suggested that rehabilitation, psychological support and medication can assist in the healing process. Another speculation is that autonomic dysregulation can occur through an improper drainage of lymphatic fluid through the cribriform plate that causes excessive amounts of interferon gamma and interleukin 7 (Outhoff 2020; Perrin *et al.* 2020).

Participants also described symptoms of body aches and pain. They mentioned the challenges that the aches and pains had inflicted on their well-being.

“The pain is at night after the day is done. If I’m just relaxing, that’s when the pain starts for maybe 2–3 hours at night. The joints are aching; you don’t know what to do; you can’t massage it because it’s in your joint; it’s an uncomfortable feeling; ... it damaged my joints, in other words.” [P12]

“I’m still having pains with my calf muscle. I still have joint aches and pains and sometimes the body pain now and again. Yes, I forgot about the body pain, which is something else as well.” [P13]

“But now my legs also trouble me, now and again, my muscles and my underfoot, ... behind your calf muscles. When you walk too much it pains, ... the pain comes in such a way you can’t walk, you have to take a break.” [P14]

The aforementioned excerpts described the discomfort patients experienced from intense body aches and pains as part of the long-COVID journey. These participants believe that the symptoms were attributable to the viral infection. They perceived discomfort and pain to the point of feeling helpless. The literature was consistent with the above findings regarding the symptomatology of long-COVID. Dryden *et al.* (2022b), who conducted a study in South Africa involving 2 413 patients, ascertained that musculoskeletal symptoms were common in those patients three months after infection. They further implied that co-morbidities are a risk factor for having post-COVID-19 symptoms, as these pre-existing conditions could have caused damage within the body that inhibited the body’s ability to fully recover from COVID-19. Additionally, this affects the ability of individuals to function optimally.

Makoni (2022) provided insight from a study of patients at a South African clinic in Cape Town. They also reported that joint pain and muscle pain were two of the most common symptoms found in long-COVID sufferers. They also described the need for self-care in the treatment of long-COVID, such as self-pacing, better diets or nutrition, mindfulness

and breathing exercises. Further, it was iterated that long-COVID could have a negative impact on people's working roles in the economy.

Participants shared that they had developed new conditions after their ordeal with COVID-19. They said:

"Shortness of breath, which was exacerbated by the COVID-19; I do experience a sleep apnoea as of recently; I need to be woken up from my sleep because of the intensity of it." [P26]

"I feel that only after I had COVID, then only I've been diagnosed with high blood pressure. There was no sign of it before COVID. I definitely think there's a link because I wasn't like this before COVID." [P17]

The aforementioned excerpts reflected how patients who were infected with COVID-19 developed new chronic conditions in addition to their co-morbidities. The patients drew conclusions that the interaction that SARS-CoV-2 had with their bodies, resulted in the development of these new conditions, such as sleep apnoea and hypertension. While the research regarding this is fairly new and limited, a study by Schwarzl *et al.* (2021) assessed 48 COVID-19 patients for obstructive sleep apnoea (OSA). Their findings showed that OSA was highly prevalent in those who had COVID-19. Delalić, Jug and Prkačin (2022) also reported from their study of 199 post-COVID patients in Croatia that 15 patients developed a new onset of high blood pressure. Zhang *et al.* (2023) conducted an observational study in New York City and included 45 398 COVID-19 patients. They had concluded that new-onset high blood pressure was found in 20.6% of the hospitalised patients and 10.85% in non-hospitalised patients. They further added that having other co-morbidities could have been a risk factor.

A diabetic patient further shared that the virus caused him to have bouts of syncope. The virus also affected his ability to walk and speak and prolonged his ability to recover. He said:

“I passed out many times in the shower. I couldn’t get up. I had COVID for a total of two months and then this third month I couldn’t talk. I was stammering... I had to walk slowly, and I couldn’t breathe.” [P15]

The aforementioned excerpt illustrated that the participant had a significantly difficult time with COVID-19, which led to a prolonged recovery period. He had experienced several severe symptoms during the post-COVID period, which prolonged his ability to heal properly. There were instances where the participant completely blacked out while bathing. The fall suggests that there could have been a potentially severe injury since it occurred in the shower. The severity of the symptoms also extended to difficulties in talking, walking and breathing. This extended period of convalescence pointed to the severity of COVID-19 among those with co-morbidities and how it further caused functional restrictions in their daily lives.

Similar findings by Ganguli *et al.* (2022) documented how co-morbidities influenced COVID-19 disease severity in Bangladesh. Their study consisted of a sample size of 1 025 patients who recovered from COVID-19. They found that patients recovery time was prolonged, especially for those who had co-morbidities with more severe outcomes in those patients with cardiovascular disease and hepatic disorders. Other research has shown that the recovery can be prolonged due to exacerbated levels of inflammation and increased hyperglycaemia among patients with diabetes (Rizvi *et al.* 2022).

There was also increasing evidence within the data, that suggested that patients had more respiratory manifestations after SARS-CoV-2 had cleared. Participant 21 who became critically ill from COVID-19 and was in the ICU, said:

“It did affect me; I have a breathing problem, I get tired. I can’t work like how I used to work.” [P21]

Others said:

“I’ve never had sinus, but now I have a running nose constantly. Every morning when I get up, even though I haven’t got a flu or anything. I have a bit of phlegm coming up.” [P23]

“I can barely blow one balloon at the moment because for some reason I can’t breathe, even if I walk too fast or up the stairs. I have shallow breathing and I feel all this happened after COVID.” [P17]

One participant described the ordeal of experiencing fatigue due to difficulty breathing, this also affected her pace. She said:

“When my breathing becomes a bit more strained, that makes me tired. Prior I could walk much faster. Obviously when you can’t breathe as you used to, you tend to get more tired.” [P18]

The data reflected that patients who had experienced significant problems with their respiratory systems as part of their long-COVID recovery. The virus had affected their ability to breathe effectively while hindering their ability to function as their former selves. The virus had caused changes within their bodies and caused discomfort. There was supposedly some biological process occurring below the surface that caused these patients to experience such symptomatology, to the point that changes were affected on the surface.

As part of the SARS-CoV-2 infection process, there is lung damage as the virus enters the body through the respiratory system (Brosnahan *et al.* 2020). Wang, Kream and Stefano (2020) provided a review of literature that showed that during the entry of the virus, there was clear injury to the lung through alveolar damage caused by the release of proinflammatory cytokines, clotting around the alveolar circulation, and direct inflammation of the airways like the bronchioles and the bronchi. Their review also brought to light the long-term effects that the virus could cause in COVID-19 survivors. Grewal *et al.* (2023) reported on findings from a prospective cohort study conducted in Canada, which assessed long-COVID symptoms in 76 patients previously infected by SARS-CoV-2 at three months, six months and twelve months, respectively. It was found that dyspnoea was commonly found in the twelfth month; additionally, they concluded that patients do not experience any improvement of dyspnoea within a one-year period. Mood is a possible risk factor, exacerbating dyspnoea. Shortness of breath was one of the conditions evident in the current sample.

Participants also expressed concerns about their immune systems. They felt that after getting infected with SARS-CoV-2, their immune system strength had deteriorated. Some of the participants said:

“I would say that my body’s immune system has also weakened since being infected with COVID. So, now when I get the flu, it takes a lot longer for me to heal and recover. It’s a feeling within your body, you just don’t feel the same anymore.” [P25]

“I am susceptible to things such as cold or flu. It takes me a lot longer to recover.” [P26]

A participant recalled having a severe respiratory infection on two occasions. They shared that their immune system had become so weak that they had become compromised when in contact with sick people. She said as follows:

“I’ve got pneumonia twice already, I’m constantly getting sick, I feel like my immune system is not what it used to be. If I come into contact with someone who is sick, then I can easily get the flu. Now I take antibiotics and after two weeks, I have to go back to the doctor, it’s constantly back and forth to the doctor.” [P17]

The data revealed that participants also experienced major effects on their immune systems. The participants made a comparison of their health pre- and post-COVID infection. The virus caused some deleterious effects on the body’s ability to defend itself against infections. The participants understood that after COVID-19, their ability to recover from new illnesses took considerably longer. They were also aware that they became more susceptible to infections. P17, who was hospitalised with pneumonia, expressed the frustration of having to constantly go to the doctor. The data reflected that COVID-19 had altered patients’ lives and the ability of their bodies to properly defend themselves against contagious illnesses.

While the research is very limited regarding changes to immunity in post-COVID patients, a study by Cheong *et al.* (2023) involving 38 COVID-19 patients in recovery

found that the virus can alter innate immunity. Since this is the body's first line of defence, it can explain the increased susceptibility to pathogens. Other findings also provided evidence that suggested that after infection with SARS-CoV-2, the immune system can become exhausted and dysregulated, especially affecting lymphocytes, which are the defence cells of the body (Files *et al.* 2021).

The data also found that participants began to experience hair thinning and hair falling out as part of their struggles with long-COVID. They mentioned:

“Because currently my hair is still very thin, it still falls.” [P18]

“The falling of the hair, I’ve lost a lot of hair.” [P23]

“One of the symptoms I did notice was a little bit of thinning of the hair, right around the cranium. It’s never happened before. I noticed it just a few months after I developed COVID.” [P26]

Participants attributed their hair loss to the virus. They also shared that their hair loss had become persistent. The symptom of hair loss in the long-COVID picture is evident in the literature as well. Czech, Sugihara and Nishimura (2022) observed from a systematic review of 29 articles that hair loss after COVID-19 was able to be reversed. Furthermore, they added that the patients could experience a long recovery period in relation to the hair loss. Additionally, the authors added that interleukin-6 could be the identifiable cause, as it inhibits the ability of hair to grow properly.

The participants further revealed a persistent loss of sensory function relating to the loss of taste and smell. Some said:

“My sense of taste and smell is not one hundred percent anymore.” [P18]

The loss of taste, I still don’t have one hundred percent taste of anything that I eat.” [P23]

One participant experienced prolonged and severe loss of taste and smell; this limited their ability to recognise what they ate:

“Just the smell and taste—now if I’m eating something, I’m eating it just because I can see it. But if you close my eyes and ask me to eat, I’m not going to be able to tell you what I’m eating.” [P15]

As evidenced, participants experienced loss of taste and smell as a prolonged symptom of their infection with the virus. They shared their struggle with not being able to taste their food. The data revealed that patients ate due to hunger and nutrition, as their ability to determine the taste and smell of foods was limited or non-existent. Yao *et al.* (2023) conducted a study in the United States, whereby biopsies of gustatory tissue in confirmed COVID-19-positive patients were utilised. They found that their taste buds contained SARS-CoV-2, 63 weeks after infection by the virus, which could account for the continued loss of taste. The loss of smell, which is also referred to as anosmia, can occur during the acute infection as the virus damages olfactory cells (Wu, Yu and Lee 2022). Mendelson *et al.* (2020) suggested that loss of smell could heal with time and re-training the nose to smell again is possible through the smell of odorous substances.

The data reflected that the participants experienced sleep disturbances as a long-COVID symptom. They said:

“Get up at 2 o clock, 3 o clock in the morning. I don’t know why.” [P09]

“It’s very hard for me to fall asleep now; previously, I was told I sleep a lot. ... What I’ve noticed, it used to be the longer sleep I get, the more refreshed I feel; however, if I get more than six hours of sleep and upwards, somehow, I would feel way more tired when I wake up.” [P19]

Participants also experienced altered sleep patterns as part of the long-COVID symptomatology. They described difficulty sleeping and falling asleep. The data reflected how COVID-19 had altered the sleep cycles of participants, mentioning the interaction between COVID-19 and the body, which caused a shift in how the body functions. There were also reports of fatigue as a consequence of disrupted sleeping patterns. Pena-Orbea *et al.* (2023) assessed how sleep was affected in the post-COVID picture through their study conducted in Cleveland, USA with a sample size of 962. They reported that 41.3% of the respondents had also experienced disruptions related to sleeping patterns. Additionally, they observed that fatigue was directly proportional to and related to sleep disturbances. There is limited understanding on the altered sleep patterns presented in people. However, inflammatory substances produced by the body during COVID-19 could be exacerbating cerebral inflammation, thereby influencing sleep patterns in the post-COVID period (Zhong, Ji and Zhou 2023).

4.4.1.3 Sub-theme 1.3: The effect of the pandemic on lifestyle and the alteration of lifestyles to establish good physical well-being

This sub-theme illustrated the experiences of participants during the lockdown and how social distancing had affected their mobility and physical activity. This sub-theme was common to both sets of samples namely, those infected and affected by COVID-19. They said:

“That was hard because I’m a person, that when I wake up, I’m out, I’m gone; I’m only coming back in the night.” [P12]

“You can’t go anywhere besides being at home. Like with me now, I’m not a person to sit at home; I like to be out and about, take my walks... having the COVID now, say about two weeks I was inside my room.” [P14]

Another participant described the challenge of feeling trapped in her home. She said:

“We used to go outside and sit outside in the front, just to get some air. We were so cooped up in the house, everything was too like ,,, closed up for us.”
[P11]

One participant described how the lockdown had compromised their physical well-being, because they were not allowed to maintain outdoor exercise routines. She said:

“Nothing was normal, I even stopped going for my walks, I couldn’t go out and do much because of my chest. Like for four weeks I couldn’t do anything. I started to walk because of my health issues, but for four weeks I couldn’t do it. So, it must have had some negative impact.” [P23]

Participants shared that the lockdown had restricted their ability to move around freely, thereby impeding their physical activity. It became apparent that the participants were unhappy with this, which resulted in a significant increase in isolation and entrapment within their homes. People were accustomed to routine daily activities, which they carried out. The sudden implementation of lockdown restrictions caused them to feel restless and confined. Moreover, the decreased level of physical activity during the lockdown led them to believe that their pre-existing health conditions could have been more adversely affected, as they became aware of their well-being. The co-morbidities of this vulnerable group of patients could have been exacerbated. The diminished physical activity was, therefore, a risk factor for poor health and well-being in relation to their mental and physical domains.

Similarly, the literature showed that when physical activity is reduced for periods of 14 days or more, there are detrimental effects on the physical health and psychological well-being of people. These include abdominal fat accumulation, anxiety, increased levels of insulin and increased inflammatory cytokines. This can be detrimental to the elderly with co-morbidities (Füzéki, Groneberg and Banzer 2020). The literature indicated a two-fold burden of reduced physical activity, namely reduced physical activity negatively influences both mental and physical health. Zach *et al.* (2021) conducted a survey to assess the effects of physical activity on people during the COVID-19 pandemic. The study sample of 1 855 participants showed that those who were physically active during the lockdown expressed resilience and positivity. While those who were not physically

active had more depressive symptoms. Secondly, Rogers *et al.* (2020) reported through a mixed-methods study in the United Kingdom that people with co-morbidities who reduce their physical activity are more likely to have negative effects on their physical health.

However, some participants remained physically active during the lockdown. They said:

“It was hard to be isolated. I couldn’t be in one place all the time. But I had to get used to it to prevent myself [From infection], but I kept myself busy in the garden and things like that.” [P04]

“We couldn’t really go anywhere... we could do home exercises.” [P18]

During the lockdown period, some of the participants did attempt to maintain physical activities in their homes. This, in turn, brought them some satisfaction and eased their discomfort. They began adapting to the confinement and social distancing. The lockdown gave people more time to themselves as the world shut down a considerable number of its usual activities. The extra time was utilised to prioritise their health and well-being.

Similar findings were evident in the literature, as Kaur *et al.* (2020) found in their qualitative study with 22 participants from India that people viewed the lockdown as a negative experience in the beginning. They eventually adapted to the sudden change and began to see it as a positive experience. Their study also found that people began to exercise at home and remain physically active despite the lockdown. The literature sheds light on the benefits of physical activity, namely reduced cardiovascular disease risk and improved immune function. Furthermore, physical activity is largely beneficial during the COVID-19 pandemic as it promotes physical well-being (Dwyer *et al.* 2020).

The data reflected the change in lifestyle that patients had to adopt because of their experiences with COVID-19. They believed that adopting healthy eating habits and

cutting out unhealthy foods would ensure their well-being. These adaptations included dietary changes, as some participants said:

“I mean, everything I was looking at after was high in vitamin C, and high in this vitamin and high in iron and high in all these things that you need on the internal because I felt like if I changed our diet, we’re vaccinated, we did good exercise, our immune system will be stronger. That’s how paranoid I got.”
[P16]

“Ever since I tested positive for COVID, I had to change my diet. Which meant eating a lot more fresh fruit, drinking plenty of water, cutting down on caffeine such as tea, coffee and energy drinks.” [P26]

The data revealed that participants who recovered from COVID-19 had to become more aware of their physical health and therefore adopt lifestyle changes, in particular dietary changes, to maintain their physical well-being. The interaction that SARS-CoV-2 had with patients with co-morbidities and their general well-being meant that lifestyle changes were necessary to ensure their physical well-being. The participants saw these changes as an effective strategy to boost their immune health, as this would protect them in the future.

Similar findings were found in a study in India, which was conducted using online surveys with 1 000 study participants. Their study provided evidence that people had concerns for their health, some of which were issues around co-morbidities like hypertension and diabetes during the COVID-19 pandemic and thus 73% of their participants adopted healthier eating habits to bolster their immune systems. Additionally, the 771 participants who were concerned about their weight adapted to dietary changes (Madan *et al.* 2021).

A scoping review of 23 research papers by Bennett *et al.* (2021) found that the lockdown caused both negative and positive changes in the lifestyles of people with regard to alcohol consumption, dietary changes and exercise. It was reported that those who adopted healthier diets also reduced their alcohol consumption. Furthermore, those who had bad lifestyles, also had poor mental health and weight gain because of bad diets and sedentary behaviours (Bennett *et al.* 2021). Albashir

(2020) provided insight into obesity and its interaction with SARS-CoV-2. He showed that obese patients were at higher risk of infection due to extensive expression of the ACE-2 receptor on fat tissue. Additionally, obese patients tended to have more strain on their respiratory physiology because of decreased respiratory compliance. The literature reflected that unhealthy and high-inflammatory diets can lead to severe COVID-19, but anti-inflammatory diets can serve as a means of protection against the virus, in particular for those with co-morbidities (Zhao *et al.* 2023).

The above literature makes a case for the fact that an increase in good lifestyle changes through good diets and increased exercise can improve physical well-being by promoting immune health. This is essential in dealing with infections caused by SARS-CoV-2 and ensuring future well-being. Therefore, measures needed to be put in place to assist those vulnerable with poor lifestyle choices, like those patients with chronic illnesses. This will ensure that they are able to cope with future infections.

4.4.2 Theme 2: The effect of COVID-19 on the mental health of people with co-morbidities

The second theme focussed on mental health, as there were numerous reports of mental health effects from the COVID-19 pandemic among the participants. The sub-themes included:

- Stressors caused by the COVID-19 pandemic;
- Mental trauma as seen through post-traumatic stress;
- Fears and anxiety during the COVID-19 pandemic;
- The isolation and its implications on mental well-being;
- Feelings of helplessness and hopelessness; and
- The implications of poor mental health.

While various separate themes and sub-themes emerged, mental health is affected by various factors as it is a complex phenomenon. As such, participants who experienced stress and anxiety were also found to experience depression due to similar risk factors. Furthermore, terms of mental health distress were utilised to describe the effects that COVID-19 had in mental health and well-being, namely depression, stress, strain, distress, loneliness, fears, anxieties, worry and somatisation. These various terms for

different emotional states all contributed collectively to the mental health effects of the participants.

4.4.2.1 Sub-theme 2.1: Stressors caused by the COVID-19 pandemic

Sub-theme 2.1 explored the stressors that participants had experienced during the COVID-19 pandemic. These stressors were the result of a multitude of deleterious consequences that were derived from the pandemic. A major stressor was the socio-economic decline experienced by many households. The participants shared that during the pandemic they were stressed by economic hardships. One participant who was previously hospitalised due to COVID-19 stated:

“It's also financial stress as well because if you have to take leave and if you don't have enough leave days, you know that becomes an issue.” [P20]

Another participant described the difficulties that ensued after her company initiated decreased working hours. She described them as follows:

“We were out of work [during hard lockdown]. Remember, they closed the work environment; we couldn't go. So, when we did go back [returned after hard lockdown], it became like a four-day thing. Then there was part-time. ... So, it was stressful because then you think they going to get rid of you. We are working again, but the output is not what it used to be; it's very low and that's also another stressful situation.” [P09]

One participant admitted that they were inundated with financial debt, as follows:

“So, financially, it put a strain with repayments of home loans. Some of it had to be defaulted.” [P19]

The data reflected that the pandemic caused several socio-economic challenges that resulted in significant stress to the participants. Employment, bill repayments and maintaining a livelihood were the key stressors identified in the data. The data also

showed that the group previously infected by the virus was affected significantly more than those who were not infected.

Being financially stable provides a sense of well-being, in which a person can have a better control over their psychological health. Furthermore, financial security can help a person overcome mental challenges (Bialowolski *et al.* 2021). Simonse *et al.* (2022) conducted a longitudinal study in the Netherlands with a sample size of 1 114 and found that financial stress was related to an inability to cope with bill repayments. Additionally, they found that having limited savings and higher amounts of debt were major stress-causing factors during the pandemic. Rodrigues, Silva and Franco (2023) conducted a study in Portugal with a sample size of 11 500. They reported that a large portion of the study's respondents worried about job security during the pandemic, which could act as a financial stressor. Therefore, economic challenges can be viewed as a significant stressor that affects the psychological well-being of people with chronic diseases.

Participants also experienced stress from their perceived vulnerabilities to becoming infected with the virus. They said:

“Mentally because we were like the people that doctors informed that chronic patients are at high risk and if they get, it its very high chance of you not making it. So, at that time, we weren't sure if it were rumours or true facts. So, we had to stress ... like what we doing.” [P07]

As evidenced, having co-morbidities caused greater levels of stress as they knew their risks around the virus. These patients understood that they were both vulnerable to infection and the possibility of death from COVID-19. This amplified their levels of stress and made them overtly cautious and aware of their morbidity. Similar findings were evident in the literature. Sayeed *et al.* (2020) conducted a study in Bangladesh with 395 participants and found that patients with co-morbidities experienced heightened stress due to fears about contracting SARS-CoV-2 given their compromised health. The study evidenced that 73.7% of the respondents experienced mild to extremely severe stress because of the presence of a co-morbidity.

4.4.2.2 Sub-theme 2.2: Psychological distress as an after effect of the COVID-19 pandemic

Sub-theme 2.2 explored the notion of psychological distress that was experienced after the period of infection. COVID-19 had many unwanted outcomes in the lives of people with co-morbidities. Participants described the consequences of the COVID-19 period, stating:

“I would say I wasn’t fully recovered, but this COVID thing is still in your mind, you know... I watch a particular thing on DSTV, I think about COVID and all those things come flashing back. I feel you know I don’t wanna be reminded of COVID... There’s so many little things that I do now that remind me of COVID.” [P13]

“When someone talks about it, it’s still a touchy subject, so I don’t like to bring it up. I’m just trying to forget about it.” [P15]

“COVID was very bad. As I told you, I’m still not at work because of this COVID. I’m coughing and fell. I still can’t go back to work. My health is not right, my neck is not right, can’t pick my neck up full. I’m still going for therapy, occupational therapy [and] physiotherapy.” [P10]

“It’s been a long and hard, scary journey. You know, as people, we always think something is gonna happen to someone else, not yourself, but when it does happen to you, it’s not a good feeling that you get.” [P12]

The participants' experiences provided evidence of the psychological distress they experienced. Participants narrated that their journey to recovery was difficult and scary. Participants had the added strain of co-morbidities, which adversely affected their ability to recover fully. This exacerbated the distress of many participants in the COVID-19 infected group. This was due to their experiences of being infected, resulting in distress. The data from this study also indicated that participants experienced certain triggers, which caused them to remember their infection period.

These triggers provoked flashbacks, which made participants feel uneasy. This occurrence coincides with the long-COVID sub-theme, which manifested on both the physical and mental levels. The aforementioned data reflected a need to identify coping mechanisms and strategies to assist in the treatment and counselling of the affected groups.

The excerpts above provided a context that portrays the participants' experiences in the post-COVID period as distressing. In fact, research has revealed that COVID-19 was perceived by many as a stressful experience (Castelli *et al.* 2020). The participants of the current study experienced some distress and were primarily in distress from the events they had experienced whilst infected with the virus. The evidence from the data demonstrates avoidance behaviour by way of trying to discuss COVID-19, which can be a way of coping and can be viewed as positive in a bid to cope with the distress that was experienced (Kagee 2024). A study was conducted in Rome, Italy, with 381 patients who had first been through the emergency room with COVID-19 and thereafter recovered. They were then assessed using the Diagnostic and statistical manual of mental disorders (fifth edition) (DSM-5) guidelines. It was reported that 115 of the participants were diagnosed with post-traumatic stress disorder (PTSD). Risk factors for PTSD were post-COVID illness and history of psychiatric illness (Janiri *et al.* 2021). Clarification on the matter of distress and trauma in relation to COVID-19 was provided by Kagee (2024), who argued that while COVID-19 was considered distressing through its various challenges, it also infringed on people. It is not sufficient to consider every experience during the COVID-19 pandemic as traumatic. The author further shared that the diagnosis of PTSD requires strictly following the criteria from the DSM-5. The current study reflected added challenges in which having a co-morbidity could pose a challenge for mental well-being and needs to be addressed through psychological counselling.

A participant who became severely ill from being infected with the virus and was ultimately rushed to the emergency room shared his anxiety that persisted after the infection. He said:

"I started getting anxiety; I get really anxious all the time. I had ... like heart palpitations, so randomly, my heart started racing for no apparent reason. But

it's much better now, but from time to time it does happen, but not all the time.”
[P20]

The aforementioned excerpt indicated how being severely ill from COVID-19 can persist beyond the active infection period. The participant shared his experience of having severe bouts of anxiety with physical manifestations of heart palpitations after COVID-19. These periods of anxiety were random and without cause. The evidence from the data suggests COVID-19 can persist on a psychological level through anxiety. Similarly, Klaser *et al.* (2021) reported from their study in London, UK with a sample size of 413 148, that a small percentage of the participants had experienced anxiety after the pandemic. Furthermore, a correlation between anxiety and the pandemic was found among the participants. Lemhöfer *et al.* (2021) concurred that anxiety was a persistent symptom post-COVID, as their study of COVID-19 survivors evinced that 24.9% of 365 study participants reported on fear and anxiety post-COVID.

4.4.2.3 Sub-theme 2.3: Fears and anxiety during the COVID-19 pandemic

Sub-theme 2.3 explored the fears and anxieties that participants had experienced during the COVID-19 pandemic. These fears and anxieties, in the excerpts below, reflected the emotional turmoil the participants felt. One of the most significant fears that participants experienced was the fear of death. The fear of death was significantly higher in the group previously infected by the virus. The participants said:

“You do feel like you’re going to die; you have these feelings... The fear of dying is the worst thing I think about.” [P09]

“COVID is just something else that just drains you out emotionally, so honestly, long story short, I was actually afraid that I would die.” [P13]

The severity of COVID-19, elicited intense bouts of fear, as one participant said:

“When I had COVID, yes, fears are I’m gonna die because I wasn’t eating, I couldn’t eat, I couldn’t walk around.” [P15]

Another participant shared a similar view, as the state of illness they were in promoted significant feelings of fear about survival. He said:

“My worry was, I just hope that I pull through it. Because in the state that I finished off and I’m thinking, ‘how come that guy is saying he got no symptoms?’ Maybe he got no taste. Why am I feeling like this? Will I make it through?” [P12]

One participant experienced emotional distress after being diagnosed with polycythemia vera and understanding that the condition was severe. However, obtaining a positive COVID-19 test only compounded her fears about death. She said:

“When I had COVID-19, I immediately felt like I was gonna die. That was the first thought, like it was a death sentence for me. I felt like I just went through a terrible ordeal with finding out I am diagnosed with this condition [Chronic illness].” [P25]

A participant feared that he would die in his sleep. He said:

“My worries were I just hope that I pull through it. Because the way I see it, maybe I’m going to sleep and not wake up. I was scared. I should always tell my family [to] make sure [that] when I fall asleep; after every five minutes, to tap me. Make sure that I’m awake and just stay there.” [P12]

A participant who was hospitalised while infected with SARS-CoV-2 recalled her deep fears, saying:

“I thought I am going to die and I told the Doctor [that] if I die, I must go home and die. I must see my children, my grandchildren and then I must die. I don’t want to die in the hospital.” [P21]

These excerpts describe the intense fear of death that participants felt. The fear was tangible and emotionally challenging, as the participants perceived it to be the worst

thing that could happen. The active infection period elicited much fear among patients. This was exacerbated because they were not able to function as they normally would be due to a decreased functional capacity. The virus significantly affected the health of participants and caused intense fears about death. One participant in particular had an intense feeling of paranoia that caused him to believe that he would die in his sleep. These fears caused sleep disturbances, which were detrimental to his physical health and well-being.

Furthermore, patients who were hospitalised experienced significant fear and wanted to be surrounded by their family, as their families were a source of comfort. The acute viral infection period caused patients to become severely ill because of the severe symptoms they had experienced. Therefore, they became anxious about whether they would recover from the illness.

Speichert *et al.* (2022) similarly conducted a study among patients who had previously been infected by SARS-CoV-2. The study identified 36.7% of the participants who were hospitalised during their infection period. Two hundred and five participants were afraid of dying while infected. A cross-sectional study by Chalhoub *et al.* (2022) with a sample of 1 840 respondents in Lebanon found that 33.7% of the participants exhibited a fear of death. Furthermore, they added that having a genetic disposition to chronic illnesses increased these fears. Another study by Jankowski *et al.* (2022) found through a survey of 13 298 respondents in the USA, that during the pandemic, insomnia levels were high and were largely related to the fears around death and dying from the virus.

The fear of death was further exacerbated when participants heard about the deaths of others around them, from the community. This fear was identified in both groups and caused people to become confined to their homes as follows:

“Very scary, to be honest, very scared because of hearing of all the deaths and stuff like that. It’s very scary up till now, and the truth is, I hardly even go out anywhere because of the same reason.” [P02]

“But the saddest part was, in fact, like another neighbour on the same road ... and her daughter picked it up, then the mum picked it up and the son. Then

these three family members on the road passed away. That was the sad part and the fear is coming to you now because you can see what's happening in your area.” [P07]

Social media was identified as a significant causative factor in promoting fear, as false news and impending doom created pessimism among participants. Some said:

“It created unnecessary hype and fear. I would try my best during that time to stay off social media. People would just like to scare the communities; messages will go around creating unnecessary hype and fear.” [P25]

“One thing I did was try to steer clear of social media because of conspiracy theories and misinformation about COVID. Those were most dangerous.” [P26]

The aforementioned excerpts provided evidence that reflected how COVID-19 had contributed to fears of death within the community setting. Communities began to face an unprecedented period as the deaths of their members and people all around them escalated, which stirred fears of death in patients with co-morbidities. This fear of death was possibly a reminder to patients of their vulnerabilities from having a co-morbidity and thus succumbing to death. Therefore, as the safety of the community was compromised, fears of death began to escalate. The data reflected that the use of social media was a perceived contributor to the heightened fears of death as people began using social media to spread misinformation. The use of social media to spread misinformation contributed to unnecessary panic.

The literature evidenced, through a systematic review by Quadros *et al.* (2021), that the fear of death was high during the pandemic due to the numerous deaths that had occurred globally. However, a single term, the fear of COVID-19, was used as an umbrella term to encapsulate all the fears. Chen *et al.* (2022b) conducted a study in China during the period of quarantine with a sample of 917 participants. They reported that during quarantine, the use of social media induced the fear of death. This was also due to their fears of personal infection.

The fear of potentially dying during the pandemic also caused intense concerns and anxiety for loved ones. Participants said:

“When I go to sleep in the night I have very less sleep. I got my grandchildren; now I look after them... you know they gone so close to me. I feel like in the event that I die what are these children gonna do.” [P06]

“I was worried that I was gonna die. That was it and the fact that my son was so small and it took me four years of fertility to have him and I was afraid that I was not gonna wake up. I was actually so paranoid that I actually asked my husband to check on all the policies that I have... so I was really scared about leaving him alone in this world.” [P16]

The data reflected that patients had begun to ruminate around the thought of potentially dying and leaving loved ones behind. This caused them to feel a sense of uncertainty regarding the care of their loved ones if they had died. The thoughts of death left them in a state of paranoia, as measures were even taken to ensure the security and safety of their loved ones after their potential demise. While the literature relating to anxiety from being separated from loved ones in the event of death is limited or non-existent after an exhaustive search. Bath (2010) suggested, through a survey in Australia with 91 university students that people can experience a fear of death itself. This personal death was also linked to being separated from a loved one if they had died, and the uncertainty and pain it would cause their loved ones. Therefore, in light of the findings from the current study, COVID-19 instilled fear and anxiety in people, which caused them to become concerned over leaving loved ones behind and how their loved ones would cope in their absence.

The data explicitly indicated the fears around infection from the virus. These fears are described in the excerpts below:

“COVID is very scary, you have to think about what you’re touching, where you [are] going, who you [are] meeting with and from the time this pandemic

started, I don't allow visitors at all... because some people tell you, like you know, I was fine. They had it, but they were fine. Maybe one day they were ill and the next they were fine. But then some people, you [are] hearing them passing away." [P02]

A participant who was hospitalised for non-COVID-related health problems feared she would get infected with the virus while in the hospital. She said:

"Although I did not go in for COVID, I was scared that I would get COVID and not come out." [P19]

Participants with co-morbidities feared, especially, that if they became infected, they would be vulnerable and die. One said:

"I was worried because they reckon it was bad if you got sugar and pressure. If you're a chronic patient, it's bad. So, I was scared. I always use my mask; I follow all the rules of COVID." [P10]

There was also an increase in sanitising efforts during the pandemic as people became more cautious. These measures were implemented to prevent infection. Participants said as follows:

"So that was a bit of a scare because as much as you [were] sanitising, as much as you [were] wearing your mask... but there were times [when] a family member had to go and get bread and get milk or whatever, and you don't know whether you could've contracted it and how." [P13]

"As soon as it started, before I got COVID. So, I was full on sanitising when I get to work. I do that... Nobody comes to my office; they all stay away from me. So, I was okay." [P15]

As described in the aforementioned excerpts, participants feared infection. Participants illustrated their concerns around the possibility of infection, which were

tied up with the fears around death. Patterns of paranoia remained within the context of the data. The patients remained cautious as to not allow people close to them and in their homes. Their hypervigilance was linked to their vulnerabilities. The participants knew their risks and therefore planned accordingly to prevent infection from the virus. While the need to sanitise and take extra precautions increased, they also understood that those precautions were not full proof. The excerpts portrayed the challenges that the participants endured because of their co-morbidities. Their chronic conditions significantly heightened fears around infection risk and the possibility of death. The fears of infection were reported equally among both samples in this study. However, it was noted that the participants from the infected group reported their fears prior to contracting the virus.

A study conducted in South Africa among healthcare workers and the general population corroborated that fears around infection and infection of others were prevalent, especially the fears around becoming severely ill and dying. Further, the fear of the unknown, caused by a fear of the future, was also evident (Rwafa-Ponela *et al.* 2022). Al-Rahimi *et al.* (2021) found that in their study conducted in Saudi Arabia with a sample size of 1 030 research participants, having a co-morbidity was a risk factor for fears of infection. They reported that 28.3% of the participants feared COVID-19.

Abdelghani *et al.* (2022) reported from their study in Egypt with 200 diabetes mellitus patients that 93.47% of the participants also had other co-morbidities. Furthermore, they found that diabetic patients had an increased fear response due to perceived risks and susceptibility to SARS-CoV-2. These patients experienced greater psychological distress and had poorer mental well-being.

As people began to experience fears of infection, there was a sharp rise in the use of sanitisers. The use of hand sanitisers was one of the most effective ways to reduce transmission and avoid infection in people (Vuppu, Mishra and Chinamgari 2023). Kim and Kim (2022) conducted a study on patients with high blood pressure and diabetes in Korea with a sample size of 74 296. They reported that patients with chronic diseases improved personal sanitising practices during the pandemic due to their perceived risks.

During the lockdown period, participants became apprehensive about seeking medical care due to the risks of infection.

“My fears were getting out of the house to access medical care because that would be very ironic as well and counterproductive to isolation.” [P26]

“I was too scared to go out and get treatment from a GP.” [P17]

Patients experienced intense fears about accessing medical care during the lockdown period, which were heightened by the risks of infection. Smolić, Fabijančić and Blaževski (2023), who collected data from participants across Europe and Israel with a sample size of 13 033, found that people with co-morbidities and older people were likely not to seek medical treatment during the pandemic. In South Africa, Pillay *et al.* (2021) accessed public healthcare facility records and reported that during April and May 2020, there were significant declines in people attending healthcare facilities. Two reasons provided for the decline were the implementation of the lockdown and the risks of contracting the virus and ultimately transmitting it to loved ones.

Fears pertaining to the future were also evident among the participants. They experienced a fear of the unknown and a fear of what would happen if they became ill from COVID-19. Participants expressed that they did not know what was going to happen next. This can be interpreted as a fear of the future, as follows:

“I was worried [about] what’s going to happen next. What’s next for us. Because it’s just me and my wife.” [P04]

“We had fears ... whether if we going to get the COVID. What’s going to happen to us.” [P05]

As evidenced in the excerpts above, the participants noted their fears of the unknown and the future. This largely stemmed from uncertainty, which was attributable to the COVID-19 pandemic. It was interesting to note that those who were not previously infected with the virus from sample 1 had a fear of the future. This was most likely due

to their perceived risks of infection and the intense feeling of uncertainty. It can be insinuated that anticipating infection from the virus can illicit fears of the unknown through uncertainty.

During the pandemic, fears of the unknown and the uncertainty that came with COVID-19 were ubiquitous (Ramose and Sethuntsa 2020). Coelho *et al.* (2020) identified the challenges faced by people during the pandemic through a systematic review. They noted that a fear of the unknown emerged from the uncertainty of the pandemic, largely due to various unknowns. Furthermore, the uncertainty led to psychological distress in the form of anxiety.

Many participants experienced anticipatory anxiety over the health of loved ones, particularly their family members. These anxieties were related to the risk of infection among their loved ones. One participant shared his/her concerns as follows:

“With him [the husband] he’s very sick. He had a stroke from last year. So, we were more scared of him if he had to contract this. This was the reason like no visitors.” [P02]

“It affected us because we didn’t know what’s gonna happen to them [parents] and there was no one there to take care in their home for them.” [P05]

“My father suffers from COPD, so I was very concerned about him. Almost 40% of his lungs don’t function. He also has underlying health conditions like asthma.” [P26]

The aforementioned data reflected the heightened anticipatory anxiety that the participants had over their loved ones. This emphasised the intense emotional challenges that they experienced during the COVID-19 pandemic, even in terms of their loved ones. Participants were worried about the vulnerabilities of their family, as they were patients with chronic diseases as well. This was an extraordinary view into the humanity of people—that while the participants knew and understood the risks to their own lives, they still embodied selflessness and cared for the well-being of their loved ones. Khademian *et al.* (2021), who conducted a study in Iran with 1 498

participants, assessed the levels of anxiety in these individuals during the pandemic. They reported that anxiety levels were higher during the pandemic and that those who had a family member who was at high risk of infection experienced a higher degree of anxiety.

Another participant described how she exposed her grandson to COVID-19 unknowingly. This affected her as follows:

“I know that I already exposed myself to him because I didn’t know that I had COVID, so that was also a fear. Because I was thinking, if this child gets sick, I gave COVID to him. But it was not intentional. It wasn’t something I had known, so that also affected me emotionally.” [P13]

The aforementioned excerpt embodied the multi-faceted drawbacks that the pandemic brought to people’s lives and described how anxiety elicited feelings of guilt. The data reflected the fear some patients felt—that if they contracted COVID-19, they could infect loved ones. This brought them considerable emotional agony. Cavalera (2020) emphasised through a review of literature that people experienced varying degrees of guilt during the pandemic. Furthermore, feelings of guilt or shame occurred among family members that put their loved ones at risk of infection by SARS-CoV-2. An added concern is that guilt can serve as a stressor for the person experiencing it. Palladini *et al.* (2023), who conducted a study in Milan with 195 respondents, found that a survivor’s guilt can be a major risk factor for depression and post-traumatic stress; insomnia can occur from this as well.

4.4.2.4 Sub-theme 2.4: The isolation and its influence on mental well-being

Sub-theme 2.4 focussed on the isolation period during the COVID-19 lockdown period. Vulnerable groups, like people with co-morbidities, experienced significant effects from the isolation, namely anxiety, depression and loneliness. One participant experienced separation from his children when travel was very difficult during the lockdown. This participant described the stress that he experienced from being separated from his sons as follows:

“My two sons are the only persons that I have left; my wife had passed on. My mum and dad had passed on. So, my two sons are the only people [who] are close to me now and not seeing [them]. I used to see him on a weekly basis. Not seeing him for a month or so was a difficulty and it was nerve-wrecking for me. I was always stressing about it.” [P08]

The aforementioned excerpt highlights how the lockdown prevented a father from visiting his sons. The lockdown caused a sudden separation between loved ones, especially if they lived apart. The data revealed that this forceful separation acted as a risk factor for a decline in mental well-being as it provoked feelings of stress. There was also an added sentiment of loneliness that can be seen in the data, as the patient apparently did not have an immediate family. These emotions of loneliness and stress can be detrimental to the psychological well-being of patients with chronic diseases.

A study by Tsui, Yip and Yip (2023) in Hong Kong with eight participants found that parents who became separated from their child had feelings of loneliness and separation or disconnection. Palgi *et al.* (2020) also found that loneliness during the implementation of social distancing affected the psychological well-being of people. Their study also found that having a co-morbidity played no role in adding to the psychological distress, reflecting that social distancing measures independently caused distress. Other literature indicated that loneliness in older adults further aggravated their co-morbidities. This is significant as most of the participants in the current study were of a senior age and had co-morbidities (Morley and Vellas 2020; Rodney, Josiah and Baptiste 2021).

Another parent was separated from her son because she was infected with the virus. She described the tumultuous moments that caused her distress during quarantine and how her separation from her child was the catalyst for her anxiety attack. She said:

“I was so sad at the fact that I had to spend fourteen days in isolation away from him. I did have an anxiety attack in isolation because I had to isolate in a room where my son was playing right outside the door...The anxiety attack, I had where my right hand and the right-hand side of my body, half my body I

couldn't move it, I was literally like stuck. I was drenched in sweat and I felt like I couldn't breathe. I felt like my mind was going insane.” [P16]

The data reflected that continuous anxiety and stress led to an anxiety attack. The patient reported that her separation from a loved one, and more specifically, her child, during a period of quarantine was enough to initiate intense feelings of anxiety. This was one of the most intense symptoms that could be seen because of the deleterious effects of the pandemic on mental well-being. The period of isolation was an important protective mechanism that would protect the patient's child. However, it acted as a mechanism of anxiety and distress.

According to the American Psychiatric Association (2013: 120), a panic attack is defined as “an abrupt surge of intense fear or discomfort.” Rajkumar *et al.* (2022) reported through a systematic review that during periods of quarantine, the rates of heightened anxiety were significantly high. Some of the factors that posed a risk for the development of anxiety were the presence of a co-morbidity and the risk of infection with family members. Alnamnakani *et al.* (2022) conducted a study assessing the effects of quarantine measures on the mental health of children in Saudi Arabia. Parents of the 436 children were surveyed through an online questionnaire, and it was found that 36.8% of the children had a panic attack and 26.8% of the children had separation anxiety.

Another participant described the comfort that she experienced from her partner and how the sudden separation from him when she was in quarantine resulted in emotional distress. People are often dependent on their loved ones and the abrupt, forced separation had a detrimental effect as follows:

“You know, and then the isolation as well. You know being away from your family and being in the bedroom all the time. You know you reach a stage like you just want to be with your partner; you want your partner there for comfort, ... and my husband and I are always talking about something. In the middle of the night, if I want a headache pill or I want a glass of water or something, my husband used to be there at my beck and call and there you go, suddenly just being alone in your bedroom, not being able to interact.” [P13]

The data reflected how the isolation elicited feelings of loneliness because of the separation during the quarantine period. Furthermore, it was evident that a lack of support from a loved one can increase levels of anxiety in vulnerable individuals. Their loved ones were viewed as a symbol of comfort and security, which the quarantine deprived them of. The period of infection caused the participants to feel a sense of separation, which put them in a vulnerable state. The extended periods of isolation only proved to cause a deterioration in their mental well-being.

Padmanabhanunni and Pretorius (2021) also found that loneliness is currently viewed as one of the most significant factors contributing to mental health consequences. They observed that loneliness can consequently damage social bonds, put strain on support networks, elicit fear and anxiety, and affect a person's sense of belonging. Yan *et al.* (2021), who conducted a study in China during the quarantine, ascertained that anxiety and depression levels were significantly higher than pre-quarantine periods, reflecting the negative consequences of the COVID-19 pandemic on mental well-being.

Depression was perceived as a consequence of isolation and loneliness. A participant shared as follows:

“A life of isolation is never meant for humans because that wears down on your mental health. Because now you are isolated and your mind starts to wander and you could sink into depression, which I did during that time. I’m anxious; I’m alone and I’m going through this condition [polycythaemia vera] of mine.” [P25]

The aforementioned excerpt described the feeling of depression a participant had during the lockdown period. This stemmed from the feeling of loneliness and from being separated from people. Being in isolation caused people to become idle, which caused unwanted thoughts. The data also reflected that having a co-morbidity and being isolated further provoked feelings of depression. Wei *et al.* (2023), who, similarly, conducted a survey in China with 1 338 respondents across three hospitals, reported that 173 of their study participants had major depression and 133 participants had major anxiety. In addition, respondents reported having feelings of loneliness from

isolation. Furthermore, they added that loneliness and isolation could heighten the risk of depression and anxiety.

Yan *et al.* (2021), who conducted a systematic review, also found depressive symptoms to be elevated among those with co-morbidities. Possible reasons are the burden of disease relating to their co-morbidities like hypertension, diabetes and heart disease, which could be exacerbated when infected with SARS-CoV-2. De Man *et al.* (2022), in a South African study found a relatively higher risk of depressive symptoms in people who were distressed about containment issues and infection risk.

One participant found the isolation to be tranquil and therefore perceived the lockdown and quarantine as positive. He said:

“That time in isolation was actually a blessing in disguise. Number 1, being isolated, meant that I was protecting myself and others from being infected. Number 2, I used that time a lot to just self-reflect and do a lot of introspection as well, in a way that was therapeutic. So, I would say that the isolation wasn’t a negative impact, but definitely a positive one for me.” [P26]

The aforementioned excerpt showed that isolation during the COVID-19 pandemic was also positive. Although many focussed on the negative aspects of social isolation, this participant experienced a sense of well-being. This period provided a sense of security from infection and allowed for personal growth through self-examination. It is, therefore, an opportunity for people to explore themselves. Therefore, isolation is beneficial for people with co-morbidities, as it allows them to protect themselves from the virus and attain personal growth. A study by Weinstein, Nguyen and Hansen (2021) reported on the positive aspects of isolation during the COVID-19 pandemic in a study with a sample of 2 035 adolescent and adult participants. The study found that solitude provided people with the opportunity for self-growth, becoming appreciative of their environment and finding peace in the silence around them, finding time for self-care through exercise and productivity and self-reflection by interacting with one’s own thoughts and their direction in life. However, their study also noted the negative aspects, namely loneliness and negative mental well-being, which is comparable to the findings of the present study, which found that many participants experienced separation, anxiety and discomfort due

to being isolated. Therefore, whilst many experienced negative effects of being isolated, some saw it as a positive experience.

4.4.2.5 Sub-theme 2.5: Feelings of helplessness and hopelessness

The fifth sub-theme reflected feelings of helplessness and hopelessness that participants had experienced. They said:

“It’s worse because you just don’t know what to do. It’s like a very frustrating, you know, helpless, hopeless situation and for somebody like me, that’s like always on the go, doing things you know. Then suddenly to be confined to your bedroom and I’m not somebody [who] can even watch TV.” [P13]

“My ex-wife was living with me, but then obviously moved out, went back to her house and then I was basically alone here. ... I was really struggling because there was no one around to help me to get the stuff [food and medication].” [P15]

“In fact, it made us feel very sad, very emotional because we couldn’t go do anything for them physically [His parents], we couldn’t help them in any way. If we had the transport, maybe we could do something.” [P05]

As evidenced by the data, participants had intense feelings of helplessness during the pandemic. The feelings of helplessness emerged from being alone with nobody to help in times of distress. The pandemic itself brought emotions of hopelessness, which exacerbated the distress. There were times that participants even felt frustrated at being isolated during periods of quarantine. The pandemic added further emotional turmoil for people who could not offer help to their parents during periods of lockdown. It is evident that the COVID-19 pandemic was a hopeless and helpless situation that many people were subjected to endure without any relief. This added emotional distress to people’s well-being.

Espinoza-Turcios *et al.* (2023) conducted a study in Honduras with 8125 participants. They showed that levels of hopelessness were higher among those individuals with co-morbidities and those who experienced loneliness. This corroborates the findings of the current study. Lok *et al.* (2023) observed through a descriptive study with a sample size of 402 in Turkey, that people who had feelings of hopelessness also experienced anxiety around death. Furthermore, Hazumi *et al.* (2022) noted that feelings of helplessness were a contributor to anxiety and depression, as 27% of their 6016 study participants in Japan experienced this.

4.4.2.6 Sub-theme 2.6: The implications of negative mental well-being

Sub-theme 2.6 explored the implications of the negative effects on mental well-being during the COVID-19 pandemic. A participant shared how depression made them susceptible to contracting COVID-19. She said:

At the [husband's] funeral people came. I don't know; although we followed all the protocols and everything, I don't know how I got it [COVID-19], but I feel maybe it comes with depression. Because for all this time at work and everything, I never get it... So, I really feel maybe it was after the feeling of depression. [P09]

Participant 09, who lost her husband to COVID-19, believed that she contracted the virus through depression. This indicated that emotions and feelings may possibly decrease the body's immunity against infectious diseases. A lot of attention focussed on how physical co-morbidities can increase disease severity on individuals. This study suggests that mental co-morbidities can also increase susceptibility. However, the participant was not diagnosed by a mental health practitioner to have had clinical depression, but her physical co-morbidities cannot be disregarded, as they could have increased her susceptibility to COVID-19 infection. The other possibility that is reflected in the data is the transmission of SARS-CoV-2 to her from her husband.

Wang *et al.* (2021) also reported that patients in the United Kingdom with pre-existing mental health co-morbidities had an increased risk of infection with COVID-19 and increased disease severity. These were found to be higher in patients with dementia and Alzheimer's disease. Further, they found that depression was a major component in

increasing the risk of infection with COVID-19 and disease severity. Another study by Wang, Xu and Volkow (2021) assessed the health records of 61 783 950 patients in the United States of America (USA). Their study found that patients who had a more recent diagnosis of mental disorders were more susceptible to COVID-19 infection. They further demonstrated that different disorders could affect the risk of infection differently. As in the case of depression, patients can become careless and not protect themselves properly. An explanation of this phenomenon is that patients with depression tend to have higher levels of central corticotropin-releasing hormone (CRH), which causes a decline in the immune system (Vasile 2020).

Participants indicated that the emotions felt during the pandemic caused their blood glucose levels to remain high. This led to a worsening of their diabetes.

“During the COVID time, in fact, I think because of all the emotions, my sugar wasn’t dropping. Because of all the worries, it wasn’t coming down. So only after some time, it came down... that’s what happened to me.” [P05]

“It was affecting my pressure because of stress also... So it did pick it up in and out, in and out. You are gonna get stressed out... Being a chronic patient, your pressure does pick up more because you are stressing how to sort this, how to sort that.” [P07]

“I feel like my pressure is gone up higher now. That’s why I’m saying the anxiety level, maybe is rising it. Worry because I have a lot of things to sort out in my life at the moment.” [P09]

The aforementioned excerpts indicated that participants experienced psychological distress during the COVID-19 pandemic, which consequently affected the pre-existing conditions of the patients. Heightened emotions like anxiety and stress which were experienced during the pandemic affected the pathophysiology of their chronic diseases. As such, conditions like diabetes and hypertension became worse. The heightened risk of infection in chronic patients elicited greater fears because of the patient’s increased

vulnerabilities to infection. Additionally, patients' lives became stressful because of the changes to their normal daily routines during the pandemic. Thus, participants conjectured that their high levels of stress that emerged from the various challenges brought about by the pandemic, affected their condition and led to deleterious physical health effects.

The literature showed that while there are direct physical implications from being infected by SARS-CoV-2 (Arumugam *et al.* 2020), there is growing evidence of the psychosomatic component (Yue *et al.* 2023). The definition of psychosomatic means that psychological stressors can affect physiological processes. Research has shown that COVID-19 results in many psychological stressors through fear and anxiety. In addition, these mental issues can have an impact on the physical body (Zidkova *et al.* 2021).

A study by Bik-Multanowska *et al.* (2022) demonstrated that patients with co-morbidities tended to have more anxiety, distress and depressive symptoms in comparison to those with no chronic diseases. This is attributed to the risk of infection and their lowered immunity and susceptibility to COVID-19. They added that the cardiovascular system seems to have been affected in significant ways. Furthermore, overstimulation of the sympathetic nervous system due to stress and anxiety has been linked to the worsening of cardiovascular diseases. These disorders range from heart palpitations to angina and myocardial infarctions. Laffin *et al.* (2022) conducted a study in the US that included 464 585 participants. They had found that emotional stress was one of the major risk factors that caused elevated blood pressure during the COVID-19 pandemic. Their study also reported that non-adherence to treatment during this time might have also contributed to elevated blood pressure. Ruissen *et al.* (2021), who conducted a study in the Netherlands with a sample size of 435, found that increased levels of stress could affect the control of blood glucose in otherwise controlled diabetics.

4.4.3 Theme 3: The economic circumstances during the COVID-19 pandemic and its effects on livelihood

The third sub-theme explored the financial and socio-economic decline experienced by participants. The sub-themes included:

- Unemployment and decreased working hours;

- The effects of the socio-economic decline; and
- Transport difficulties.

This overarching theme related to the basic socio-economic problems participants faced, which led to unfavourable financial circumstances. The sub-themes that follow attempt to break down the different aspects of socio-economic challenges and financial problems many participants had to deal with:

4.4.3.1 Sub-theme 3.1: Unemployment and decreased working hours

A significant effect of the COVID-19 pandemic among participants was the loss of employment and reduced working hours. This was mainly due to low work output during the lockdown and a sluggish economy. A participant identified these challenges and described how the reduced working hours during the pandemic affected them, as follows:

“We were out of work. Remember, they closed the work environment. So, when we did go back, it became like a four-day thing. Then there was part-time. So, I used to work at home, which was not even right because I had to be at work. So, it was stressful because you think they going to get rid of you. All kinds of things come through your mind. We [are] working again, but the output is not what it used to be; it’s very low, and that’s also another stressful situation.” [P09]

The economic decline was a significant factor, which intensified financial struggles, which in turn affected the livelihood of families. The challenges of businesses in maintaining productivity, endangered employees’ lives. A participant described these difficulties as follows:

“COVID came in and caused a heavy financial struggle for lots of people, including myself... You [are] not working and plus the days are cut down as well. Because the company wasn’t performing well because there’s no job coming in. So, they had to reduce staff, cut down on wages, cut down on the days you work. So, it was a bit hard for me too. Even currently, to provide for them [family], it’s a bit hard.” [P07]

Other participants described the challenges of facing pay cuts and retrenchment. This led to difficulties in their homes and created additional strain. They said as follows:

“It affected us like everybody... Because we wasn’t working for that time those three weeks full lockdown. I was only getting a percent of my salary. It was hard; it was very hard.” [P10]

“My husband was retrenched because of the impact of COVID; they became retrenched during the lockdown. Basically, I was the only one working and there was a lot of financial stress.” [P17]

As evidenced by the data, the consequences that originated from the pandemic in the lives of people related to the declining economy were considerable. The lockdown was seen as a primary cause of the socio-economic decline. There were many instances of reduced working hours and, in some instances, loss of employment and staff reduction to cut costs. The start of the lockdown initiated mass levels of unemployment and caused people unnecessary strain that led them to financial hardship.

The data indicated that normal work weeks were reduced significantly with a scaling down on salaries. Further, there is evidence of reduced output in the workplace due to the lockdown and the sluggish economy. This accounted for the reduced work weeks. Additionally, the companies struggled to ensure that their employees were financially secure during the lockdown. This can be attributed to the limited services required during that time. Therefore, from the available data, it can be deduced that the reduced working hours, loss of employment and considerable pay cuts could escalate poverty and financial distress among people with co-morbidities.

Posel, Oyenubi and Kollamparambil (2021) also found that a widespread surge in the level of unemployment occurred during periods of lockdown in South Africa with approximately 2.2 to 2.8 million job losses among the population. Ranchhod and Daniels (2021), who also conducted a study in South Africa with a sample size of 6 069 participants, found that among their employed participants, the level of employment decreased from 57% in February 2020 to 48.1% in April 2020.

Additionally, they observed that from February to April, full-time employees had reduced working hours. Arndt *et al.* (2020) emphasised that during the lockdown, it was people with lower educational levels who bore the brunt of salary reductions and reduced working hours, while those who had higher levels of education were also affected. However, they experienced less of an impact.

Participants noted that while there were pay cuts and a lack of employment opportunities, there was also a loss of employment from illnesses. One participant mentioned that he had become unemployed because of the symptoms of long-COVID.

“Now I’m working for R100 a day, doing five times harder work than what I was doing for R400 a day, but I had no choice... So, the COVID has like really cut my budget in less than half—way less than half. you could say. You could say that it’s due to COVID that I lost my job now... It’s because I’m unable to do something for a period of time.” [P12]

Another participant who was previously hospitalised due to COVID-19, recalled having long-COVID symptoms, which affected his ability to work properly. He said:

“I was admitted at hospital and I did take a week of sick leave and then I went back to work. But when I went back to work, I started getting randomly sick, I was getting more sick than before, I think my immunity was low.” [P20]

A significant finding was that the physical effects of the virus, which manifested as long-COVID, affected the physical health of participants, which led to a decreased ability to work. The substantial effects inflicted on people during the lockdown period continued to have repercussions in their lives even after the lockdown ended. People had to settle for the smallest of opportunities given to them in terms of employment and adjust to a new way of living.

A Hawaiian study consisting of 327 respondents found that in the first half of the year of their lockdown in 2020, 6.43% were likely to be unemployed and by the second half of the year, that number rose to 7.07%. These levels of unemployment were due to the lingering symptoms of long-COVID (Bonham, Juarez and Siegal 2023). The long

and difficult journey dealing with long-COVID symptoms has affected people's ability to work, as the workforce could potentially be unable to return to work because of lingering long-COVID manifestations (Suran 2023).

The data reflected that participants began to make a living through the sale of cigarettes and alcohol, despite it being banned during the level 5 lockdown. One participant said:

“Financially, it was low because, you know, people weren’t working. So, we were selling cigarettes and alcohol, and we did get caught by the police. Because we sold to one guy and he was a police [officer] and we didn’t know. But we still continued to sell those stuff to make money.” [P18]

The above excerpt portrays the dire situation people faced during the lockdown. Due to the considerably negative effects of the lockdown on finances, people resorted to the sale of alcohol and cigarettes, despite the sale of those substances being banned under lockdown restrictions. The data reflected the desperation of this participant and the need to earn a living, despite the many risks involved. Van der Zee, Filby and van Walbeek (2022) found through a cross-sectional, longitudinal survey conducted in South Africa that even though the country had implemented a ban on the sale of cigarettes, the sale of these items continued. Similarly, Theron *et al.* (2022) reported through an online survey consisting of 798 participants in South Africa that 53.5% of its respondents admitted to having purchased alcohol illegally.

One participant reflected on the positive aspects of being employed during the COVID-19 pandemic. He said:

“It’s ironic [that] because of COVID, I was actually given more opportunities. Being appointed as an assistant and a student mentor, were both something that arose out of COVID as well. Working two part-time jobs actually boosted my finances.” [P26]

The aforementioned excerpt indicated the positive aspects of being employed during the COVID-19 pandemic. While there were high levels of unemployment, the participant was

fortunate to access more work opportunities and attain a sense of financial security. McDowell *et al.* (2021) found through a study in the United States with 2 301 adults that those who became unemployed during the COVID-19 pandemic were more stressed, had anxiety and experienced depression. Therefore, unemployment was associated with negative effects on mental health, which was likely due to concerns about maintaining livelihoods and uncertainty about their future in relation to financial stability. Research validates that being financially stable can improve mental well-being and mitigate distress because of an increase in income, which is used to secure livelihoods (Netemeyer *et al.* 2017). Therefore, people with co-morbidities benefitted from increased employment opportunities, which is a protective factor against distress because of financial security.

4.4.3.2 Sub-theme 3.2: The economic impact of COVID-19 and the lockdown

Sub-theme 3.2 encapsulated the effects of the socio-economic decline and how it caused people to accumulate debt and experience a diminished livelihood during the pandemic. The participants reported being unable to meet basic needs and fulfil their responsibilities due to socio-economic complications in society. As previously discussed, the lockdown impeded people's ability to work, which further compounded financial problems and led to unsatisfactory living conditions. Individuals began accumulating financial debt. The participants said:

"With the petrol price going up and food price [the going up], your money is not enough anymore. ... The payments, I'm now more actually in debt than before because I feel that COVID contributed to having it." [P09]

"I'm going through a very big problem in my life; my husband died two weeks ago, so we didn't pay the bond... He didn't even have a funeral policy: that his brother had to give us money to pay for the funeral." [P11]

The lockdown not only led to social distancing but changed the economic dynamics in South Africa. In an attempt to curb the spread of infection, poor livelihoods posed a

significant threat to the affected individuals. One participant described the hardship of living without an income:

“We were not working and without work, there’s no money... So, financially, yes, it was a strain on me... For twenty-one days, I didn’t even earn a single cent... Well, paying my bills was one challenge that I had. You know my rent; my lights and water all went backwards; my accounts went backwards; obtaining food supply was a difficulty.” [P08]

Participants explicitly attributed their financial burdens to the effects of the COVID-19 pandemic. The severe economic disruptions caused a major impact on people’s ability to maintain their households’ expenses, especially the rent, utilities, bond repayments, food expenses and insurance policies. This was compounded by the reduced working hours, the lack of employment and the reduced wages. The added pressure of maintaining households and livelihoods during the pandemic had a considerable effect on the well-being of people.

Rodrigues, Silva and Franco (2023) found that the pandemic caused a massive financial crisis in people’s lives. They added that due to the high levels of unemployment, families had to incur higher expenditure costs. An online survey by Nigatu, Elton-Marshall and Hamilton (2023) involving 3 033 Canadian participants found that 17.5% of the participants had accumulated higher debt after the COVID-19 pandemic. The rise in debt was linked to factors such as unemployment and reduced household income. Kurowski (2021) recommended that while it was difficult to predict the impact that the pandemic could have had on people’s finances, having an established budget before a crisis can stave off the effects of financial loss. They further suggested that having financial literacy would largely prevent the burden of debt.

Participants who owned businesses reported on the repercussions of the socio-economic decline, saying:

“I do maintenance and during the COVID, we couldn’t work because we couldn’t go to people’s houses; people didn’t want us in there. I mean, at the end of the day, if you don’t work, there’s no money... What little we had, we

used, and now we still trying to recoup and come back again... but we [are] still battling.” [P05]

People did not allow service providers into their homes, leaving them without work and facing income challenges due to possible fears of infection. Therefore, the pandemic affected small businesses with people not being able to maintain an income, which left them inundated with increased financial burdens. In the USA, the number of active small businesses, totalling 15 million, which were very active before the onset of COVID-19 restrictions, rapidly declined to 11 million following the implementation of these restrictions. Furthermore, some businesses were not able to reopen due to limited funds (Kalogiannidis 2020). Ikwegbue *et al.* (2021) reported via a content analysis review that the South African government provided a financial rescue package to alleviate the financial burden on small businesses. They found that unregistered, small businesses were sidelined.

Participants also began to experience a decline in their abilities to maintain their livelihoods and obtain basic needs. They said:

“We used to struggle here during the lockdown.” [P01]

“We couldn’t get all our basic needs; we couldn’t meet all our basic needs.” [P05]

The lack of income caused dire circumstances, as parents felt the strain of not being able to provide for their families. One said:

“To provide for them is the most important thing... By me not working, you can’t get the income to support them... but as a father financially now, it is taking a strain on me.” [P07]

Other participants described their inability to obtain items for basic needs as the price of necessities increased. They narrated as follows:

“Things was hard at that time: it was just my father that was working and he was feeling the pressure of the rent and taking care of me now... So it was a bit hard and difficult at that time. Because I also played a big role when I was working with regards to the income and the daily needs.” [P12]

“We took a major salary cut. I was maybe getting 65% of my salary, prices of basic needs were still rising. We did not have a decrease in that. So, it was very difficult to meet basic needs.” [P25]

The data evidenced that people became inundated with multiple socio-economic challenges imposed upon them during the pandemic. These issues limited the capacity of individuals to obtain their basic needs and maintain their livelihoods. As such, people found it difficult to provide for their families and secure their basic needs, especially those who had children. Participants also had to deal with the inconvenience of the escalating prices of basic needs. The data also reflected that the loss of employment further impeded the ability of families to ensure that they met their basic needs. Additionally, those families with single breadwinners found it challenging to survive. Obtaining basic needs was critical to survival; however, the pandemic only worsened the livelihoods of people and exacerbated their problems. This increased the negative effects on their well-being.

The literature indicated that during the start of the pandemic there was a substantial decline in economic activity, which largely affected those who were financially vulnerable. Additionally, the fears around the economy, job security, ability to maintain household expenses added to the distress within the family setting (Andrade *et al.* 2022). Therefore, Schotte and Zizzamia (2023) ascertained that those individuals who were poorer and financially unstable were significantly affected with a disruption to their livelihood. Niles *et al.* (2020) assessed the livelihood of 3 219 people in Vermont and established that food security was largely owing to job losses and the accessibility of food. There were deleterious effects on mental health and immune function. Lewis *et al.* (2023) found in an Australian study that healthy food prices escalated during the 2019—2021 period, which was extensively related to the supply chain during the COVID-19 period, including a reduced workforce.

4.4.3.3 Sub-theme 3.3: Transport difficulties

Sub-theme 3.3 focussed on the transport difficulties that participants had during the COVID-19 pandemic, especially during the lockdown. These difficulties revolved around the availability of public transport, the cost of travel, the standards of safety that these vehicles had adopted and access during COVID-19 restrictions. Financial problems added to this difficulty. The participants said:

“Transportation; I don’t have money. I walk on my feet from Cornubia and back.” [P01]

“I think most of the time we were walking if you wanted to get to your destination. That’s the initial beginning when COVID hit. When the lockdown was hard, so there was no transport... Transport [wasn’t] running and also financially. At that stage, and I remember, I think there was also the problem with the fuel; because of COVID you couldn’t get those trucks moving.” [P07]

The excerpts above provided evidence that participants experienced major financial obstacles that deterred them from using public transport during the pandemic, hence they opted to walk. This was primarily due to their socio-economic decline and financial instability. However, the availability of transport also played a role in determining how people travelled, thus walking seemed like a feasible option.

In a Ugandan study with a sample size of 30, it was reported that due to increasing costs of public transport, people perceived public transport during the COVID-19 pandemic as unaffordable (Giebel *et al.* 2022). Another study using both qualitative and quantitative methodologies through the use of tweets from Twitter found that people opted to walk rather than use public transport due to the fear of COVID-19 (Habib and Anik 2023).

Participants also described the unsatisfactory conditions of public transport. They added:

“Taking the taxi is like out of the question, so you’ll have to get an Uber.” [P02]

“Public transport was a big challenge because you are using taxis. There were Uber services, but it’s not always available. Taxis! Who would want to sit in a taxi? who would want to sit in a bus? Not everybody was compliant with COVID rules and regulations in terms of masks, so that was a challenge.” [P13]

“There was no taxis; the second point there was no Ubers and then you know the taxis take the law into their own hands. So, there was no social distancing, no wearing of masks, sanitising, only when somebody is looking at you, so that was really difficult. Uber is really expensive and also in our area, it’s also like really scarce.” [P16]

There was an added fear of using public transport that related to the sanitary standards and social distancing within the vehicle. The participants were apprehensive about utilising these services, as they feared the failure to follow the lockdown rules exposed them to personal infection and to the virus. Gkiotsalitis and Cats (2021) similarly reported from a systematic review that people were more apprehensive about taking public transport due to concerns around hygiene. On the South African side, around 60% of the population used public transport before COVID-19. This, however, declined significantly after the pandemic, especially during the lockdown. The government banned public transport, except minibus taxis, at limited capacity. Further, the government was unable to control the social distancing and hygiene standards within these vehicles (Venter, Hayes and Zyl 2020). Luke (2020) noted that taxi operators usually violated COVID-19 restrictions and filled taxis to capacity, despite restrictions indicating 70% capacity for public travel. This undeniably jeopardised the health of its occupants.

4.4.4 Theme 4: Outlining the influence of the community during heightened periods of tribulation

The fourth theme reflected the community and its setting during the lockdown and post-lockdown period. The sub-themes included:

- Breaking COVID-19 protocols,
- A heightened sense of unity within the community, and
- The humanitarian role of the community and religious organisations.

4.4.4.1 Sub-theme 4.1: Breaking COVID-19 protocols

The data revealed the community dynamics during the COVID-19 pandemic. People within the community were engaging in risky behaviour. Participants shared their thoughts on how community members were not following COVID-19 restriction protocols:

“Unfortunately, no one followed protocols. There was no social distancing, no using of masks as well. There were a lot of gatherings with alcohol.” [P26]

“My family is like always together all the time. So, they didn’t even bother that it was a pandemic. Everyone used to meet up at my house and have something to eat, drink, play cards and interact with each other.” [P18]

There was an increase in risky behaviour in public places as people did not follow the mandated requirements of wearing masks. A participant thought this to be irresponsible, possibly due to her vulnerabilities of having a co-morbidity and fears of re-infection. She said:

“You can go to malls and you found like irresponsible people... You would find selfish people; I would say that use to wear the mask wrong.” [P13]

The data reflected concerns that participants had regarding the breaking of COVID-19 restrictions. The participants described the community dynamics during various stages of the pandemic, namely the hard lockdown and post-lockdown periods.

Community members and members of the public created risky situations by having social gatherings, drinking alcohol and wearing masks incorrectly or not at all. Participants became concerned about this behaviour, perhaps due to the perceived risks of infection and vulnerability towards SARS-CoV-2. The South African government implemented some of the toughest COVID-19 lockdown restrictions in the world. These measures included implementing social distancing, prohibiting gatherings, and imposing restrictions on alcohol and cigarette sales (Broadbent, Combrink and Smart 2020).

The empirical literature reflected similar findings to the current study. Dukhi *et al.* (2021) conducted a survey with 19 933 participants across South Africa. Their study found that 92.3% of the participants were confident in their own or their family's ability to follow COVID-19 protocols. However, only 62.9% were confident that their neighbours were following protocols and 44.5% of the respondents were confident that their community was following the guidelines in place. Furthermore, the implications of not following COVID-19 restrictions risk the spread of the virus, ultimately putting people at risk.

4.4.4.2 Sub-theme 4.2: Heightened sense of unity within the community

Sub-theme 4.2 focussed on the increased sense of unity that had occurred within the community during the COVID-19 pandemic. The participants reflected on the united front that communities had, which encompassed increased support, helpfulness and humanity. This can be seen in the excerpts as follows:

"It wasn't really a hostile environment. We still considered one another, although we couldn't really interact. People were helping where they could."
[P18]

"Our community really came together. We are so thankful and grateful for that, because we all are strangers here. I think that there was humanity in that point in time." [P25]

"People were supportive of each other, but not personally." [P23]

The data reflected that the participants felt a sense of togetherness within the community at the start of the pandemic. Participants sensed that community members felt connected to each other. Although the COVID-19 pandemic and the practice of social distancing changed the way people interacted with each other, there was still sensitivity towards each other's plights. However, it was also clear that caution was present in the community. Even though participants expressed support in a new manner that did not compromise their safety.

Community plays a vital role in the sense of belonging and support in the lives of people. This is an essential component for navigating through difficult periods of life, which can be likened to the COVID-19 pandemic. Furthermore, the community experienced difficulties together, which helped buffer its effects (Bowe *et al.* 2022). In the context of South Africa, Thabethe and Pulla (2022: 35-46) conducted a systematic review and looked at *Ubuntu* during the pandemic. Ubuntu is defined as '*I am because we are*'. Their study found that the South African community emphasised *Ubuntu* through solidarity, as communities became stronger together. Furthermore, they noted that when people come together, there are reduced feelings of being alone and added feelings of support.

The data further reflected a sense of compassion during the pandemic. The lockdown caused people to become more compassionate towards those around them. They said:

"We were worried about people who had it [COVID-19]. We didn't know if some of them were going to recover or not and we worried about all the people that were dying as well." [P05]

There was an increased sense of compassion for loved ones, which surrounded a feeling of regret. A participant recounted how the COVID-19 pandemic snatched away the lives of loved ones they thought were ahead of them. She said:

"There were people that we lost along the way. Some of them just had so many aspirations—so much of dreams—and just for [them] to be snatched

away. I think that really even till now affects me and I'm not saying this with any bad feelings or animosity or any hatred. Sometimes I just feel when you look at the people around us that are benefitting from what the individuals have left behind, it's really sad." [P13]

The data evidenced that participants became filled with compassion for those around them, including family members. There were feelings of sadness when participants reflected on their loved ones and those around them. The pandemic was viewed as unjust as it snatched the lives of people they cared for. These feelings of compassion were centred around concern for others. Matos *et al.* (2023) opined that compassion is the capability of people to offer support and care for those in need. They reported that during the pandemic, compassion for others increased. This is indicative of promoting resilience and post-traumatic growth. Ghanbari-Afra *et al.* (2021) argued that COVID-19 provided people with the opportunity to be empathetic towards one another. Research indicated that the pandemic was a period of intense turmoil that occurred ubiquitously; therefore, it was a time that allowed compassion to flow more easily. As the struggles of people occurred all around, greater levels of compassion grew in a directly proportional manner (Matos *et al.* 2023).

4.4.4.3 Sub-theme 4.3: The humanitarian role of the community and religious organisations

Sub-theme 4.3 revolved around the humanitarian role of the community and religious agencies that assisted those in need during the pandemic. The participants began to care for those around them, like their family and friends. They showed their care through their actions. One participant narrated how she was able to assist those around her by running shopping errands. She mentioned that:

"Everybody was very caring and considerate, whereby if there was elderly people. If we were going out, we would sort of help them with their shopping." [P18]

The COVID-19 pandemic was a period of extraordinary circumstances however, the humanity of people has been a useful safeguard in ensuring the well-being of others. One participant shared recounted the benevolent deeds of helping others obtain medication, checking on family and providing meals:

“There were days where I had to go to a pharmacy; there were days when I had to phone my brother’s family; the whole family was infected at the same time... It was also worrying about the meals; it was also worrying about their bread and their basic necessities that we had to provide.” [P13]

Another participant shared similar sentiments:

“There was a relative of mine that had it [COVID-19]. I used to go buy medication from the chemist, buy lemons, garlic and I should go give him and I used to be scared, but he was in one room. I should just take the packet and leave it by the door and he should come and take it... I had to go and give him breakfast. I must go give him lunch. I must go give him supper. It was a bit hectic.” [P06]

The aforementioned excerpts described the benevolence of people during the pandemic, as people became more charitable. The effects of the pandemic had far-reaching implications for the well-being of people. The socio-economic decline and declining livelihoods of people were the undesirable consequences of the pandemic. However, during that period of hardship, people connected with their humane side and offered help to those in need. Participants also noted their contributions to society, which entailed their charity by means of providing essential items like food and medication to people. This study identified the effects that COVID-19 had on the psychological well-being of people, namely distress, depression, hopelessness, fears and anxiety. However, the benevolence of people helped to ease these negative emotions. The support that the participants had provided was at their own expense and time, which indicated how the pandemic had caused people to become selfless during a difficult time.

COVID-19 had inundated the lives of many people across the world as areas of finances, livelihoods and healthcare were compromised. The literature evidenced that the difficult

periods caused people to become helpful and exhibit prosocial behaviour in which they helped those around them. In addition, this type of behaviour allowed a person to feel a sense of well-being through the act of giving (Wider *et al.* 2022). Espinosa, Antón and Grueso Hinestroza (2022) conducted a study in Colombia with 2 574 participants. Their study found that, during times of emotional distress, being prosocial can help buffer the effects of psychological distress. This ensured that people achieved satisfaction that led to a feeling of well-being.

In South Africa, Taliep *et al.* (2022) conducted a cross-sectional survey with a study sample size of 2 118 participants. Their findings reflected that during the pandemic, people became more helpful; as such, they assisted those around them by sharing food, giving money and helping with chores and shopping. Furthermore, they added that the behaviour was seen in those who were more economically advantaged and in those who experienced financial losses and thus understood the need to assist those in need. In the context of the current study, prosocial behaviour was important for people with co-morbidities. This vulnerable group of people was susceptible to the psychological effects of the pandemic and as such, the actions of giving to others helped them achieve satisfaction. Therefore, it can be ideated that they achieved well-being, which allowed them to overcome the negative effects on their well-being from the pandemic.

The COVID-19 pandemic enabled the humanitarian side of many charitable and religious organisations to emerge, along with people who sought to support people in need by endeavouring to provide people with essentials such as food and necessities, as evidenced in the excerpts below:

“My daughter lost her job, my son lost his job and luckily for me, I’ve got a mother; she should buy things. Then we had the counsellors. I got a hold of counsellors; I told them this is the situation; they gave me a voucher; and we survived. People used to come distribute bread, milk all over here.” [P06]

The economic decline was a considerable challenge however, the role of the community providing support had alleviated this burden. Some participants accessed basic necessities that helped them maintain their livelihoods:

“If I’m not mistaken, charity were giving those hampers, food meals, which I did go and attend... plus getting help from my aunt, she should send some money to me. Because there was no income coming in at all. No work, no pay, and it was a bit hard.” [P07]

“We had a lot of help from family and friends. There was people coming around giving hampers. My family was helping us with groceries, friends as well.” [P12]

The religious organisations activated their support through charitable donations, hampers and the support of the community. This enabled people to find an amelioration for the economic challenges that surrounded them. Participants said as follows:

“We had our local religious communities coming together. The Hindu society, the Muslim society and our Christian society would donate basic essentials to our areas. So, it would be bread and milk on a weekly basis. I felt it was so overwhelming to know that we’re not alone and somebody cares enough.” [P25]

“Religious organisations such as churches and mosques, definitely stepped up, like Gift of the Givers... to cater for those that were underprivileged, especially in families that lost their breadwinners.” [P26]

The data evidenced that the participants had experienced the philanthropic influence of people, charity and religious organisations throughout the COVID-19 pandemic. Despite the economic challenges, these organizations ensured the participants' well-being by providing them with basic necessities. The data identified the importance of charity and religious organisations during times of crisis. The role played by these organisations was crucial during the COVID-19 pandemic, as they helped the most vulnerable, in particular those with co-morbidities and provided a sense of support that alleviated the burden on the people and gave them a sense of comfort.

South Africa was reported to have become more charitable as a community during the pandemic as found in a survey run by the Charities Aid Foundation (CAF). It was listed as number 21 on a list of 114 countries to be most generous (Charities Aid Foundation Southern Africa 2021). Breeze (2021) argued that without philanthropy, the South African community would be in a dire state as poverty and inequality is rife. The repercussions of a lack of philanthropic activity caused limited access to education, starvation, discrimination and exclusion. Boro *et al.* (2022) conducted a study in three countries, namely Brazil, Indonesia and Sri Lanka. Their study assessed the function of religious organisations during the pandemic and found that religious organisations in these countries were able to provide economic relief during the pandemic.

The role of religious organisations and other charitable organisations is both indispensable and important to the community. These organisations help those in need, in particular the vulnerable, in times of distress. People with co-morbidities were able to benefit from the benevolence of these organisations and attain a sense of security.

4.4.5 Theme 5: Social life during the pandemic

Theme 5 explored the impact of COVID-19 on the social lives of people living with co-morbidities. The participants had experienced a more negative influence on their social lives and their ability to interact with others. This led to participants having a new way of living in the post-pandemic period, in which they practised more caution when interacting with others. The sub-themes included:

- The influence of the COVID-19 pandemic on social lives; and
- Understanding how the COVID-19 pandemic has re-defined social norms.

4.4.5.1 Sub-theme 5.1: The influence of the COVID-19 pandemic on social lives

Sub-theme 5.1 explored the influence of the pandemic on the social lives of people living with co-morbidities. During the course of the COVID-19 pandemic, there were limitations put in place that hindered people's ability to socialise as they did before the pandemic. The participants shared their experiences of being socially restricted. A participant described the missed opportunities during the lockdown, which prevented her from sharing precious moments with family. She said:

“There was not much social life for sure, so obviously not being able to see close friends and family, which did affect me, so obviously you miss them. There were babies being born and you couldn’t do what you would usually do.” [P19]

The lockdown affected relations and bonds with both family and friends; it served as a mechanism to dismantle built connections, as one participant shared how the lockdown and social isolation strained her romantic relationship:

“I was in a relationship at that time; it took a major strain on that relationship because we were not seeing each other. Not having that physical contact with your friends with your family, your loved ones, your partner is very difficult.” [P25]

Other participants narrated how the lockdown acted as a barricade to their social lives thereby preventing them from interacting with loved ones, which led to disappointment. They said:

“At work, we socialise with each other on a regular basis and that just stopped completely and that was frustrating... I haven’t been to the movies ever since COVID.” [P17]

“It was a little disappointing even then and up till now, I don’t get to see my family or friends.” [P26]

The aforementioned excerpts provided evidence that showed how the lives of the participants had changed during the lockdown period. The sudden shift to being isolated and confined caused people to change the way that they functioned in their social spheres. Participants narrated how the lockdown had caused them to miss out on special family moments. Furthermore, the lockdown had impacted romantic relationships, which caused a strain on their bonds. Participants who went out regularly felt angry about having to adjust to their new circumstances. The

repercussions of the disruption to their social lives could have potential negative effects on the well-being of people with co-morbidities.

Human nature is inherently social, as humans need relational bonds with people in an active way. People need to be able to interact with one another to feel a sense of well-being (Petersen, Fiske and Schubert 2019). Research has evidenced that through the act of social interaction, people find a sense of belonging and identity. Furthermore, a sense of intimacy is accessed through close bonds with romantic partners, family members and friends. This can improve mental well-being and physical health. Additionally, the lack of physical touch can be detrimental to the well-being of an individual (Long *et al.* 2022).

The literature reflected similar findings as the current study. A study by Derbyshire *et al.* (2023) was conducted across North America and Europe with a sample size of 570 participants. They found that romantic relationships were affected during the pandemic, especially those that had limited contact. This led to a stressful state and caused commitment issues.

4.4.5.2 Sub-theme 5.2: Understanding how the COVID-19 pandemic has re-defined social norms

Sub-theme 5.2 explored how the pandemic changed the behaviour of people and re-defined their social norms. The participants became weary of their social interactions and limited contact with people in the post-pandemic period. They said:

“After COVID, we don’t go out visiting that much anymore. We limit our going out as well. We try not to be found in too many gatherings. Because we never know when this thing is going to get us.” [P23]

“I wasn’t scared to go back to normality, but there were obviously my reservations, and my reservations are still in place; for example, overcrowded places.” [P19]

A participant noted that while there were fears about infection, the lockdown has redefined the way people interact, as there was no longer the need for physical connection, unlike before the COVID-19 pandemic. He said:

“I do see my friends a lot less than I used to. I believe the risk of infection does play a part, but I think during the time of the lockdown, people realised that it’s not necessary to have [as] many social visits as before.” [P26]

The aforementioned excerpts reflect the patient’s adaptations to living life after the lockdown. It was strikingly evident that participants were wary and apprehensive about living as they did before the pandemic. The participants had become more cautious due to their perceived risks of infections and realised that gatherings were not safe and social visitations were not as absolutely necessary as before. The experiences from the pandemic caused patients with co-morbidities to weigh the risks to their health and employ strategies to ensure their well-being. This adapted lifestyle became a new way of living in response to having been through the difficulties of the COVID-19 pandemic.

The data from a study that was conducted in Ohio, in the USA with a sample of 654 participants found that age was largely correlated with the use of precautionary measures by people. Additionally, the older the person the more precautions were taken. This was mainly due to people’s perception of infection risk (Sheehan *et al.* 2020). Wajid *et al.* (2022) identified changes in the social behaviour of people in Saudi Arabia during the post-pandemic period from a study that consisted of 348 participants. Furthermore, these changes included avoidance of public gatherings among 36% of the respondents. The current study emphasised the behaviours that people had after the COVID-19 pandemic. These behaviours are protective mechanisms that persisted, possibly due to their perceived vulnerabilities and susceptibility to the virus because of their co-morbidities.

4.4.6 Theme 6: The role of family and loved ones in times of adversity

The sixth theme focussed on family and friends during times of adversity and the support they provided. The sub-themes included:

- Understanding how the lockdown affected family bonding and relationships;
- Family conflict;
- Activities within the home during the lockdown;
- Family and friends as a support structure;
- Caring for loved ones; and
- Bereavement during the COVID-19 pandemic.

4.4.6.1 Sub-theme 6.1: Understanding how the lockdown affected family bonding and relationships

Sub-theme 6.1 was formulated based on participants experiences around family bonding. The COVID-19 pandemic allowed family members to have more time to bond, especially during the lockdown period. This period forged greater bonds between family members. Some participants said:

“In the first lockdown, you know, my kids, I had a lot of time to spend with them. You know a lot of good quality time because the schools were closed and having them with you to spend some time with you, twenty-one days or so. I’m a single parent; I have to leave home, go to work and not spend quality time with my kids. So, it was good.” [P08]

“It has brought the family closer together compared to what they were.” [P17]

The COVID-19 pandemic was a period of great anguish globally; however, family bonding fostered a sense of comfort. A participant shared as follows:

“Although there was so much trauma happening out of the home itself, but internally there was pretty good bonding, and you know spending time. So, that was great.” [P18]

Another participant viewed the lockdown period as a means of securing family time, as people are often bound to their demanding lifestyles. She said:

“I think it was more family bonding. I’m working, my dad’s working, my mum’s at home... So, we lead very busy lives. We were able to spend some time together.” [P25]

During the COVID-19 lockdown, people bonded by using technology, which showed its importance. They said:

“We only could bond over the phone. Talk over the phone. That’s the only thing we could do. We couldn’t go to them [parents].” [P05]

“I think that [on the] fourth day or the fifth day I felt so much better because I felt better emotionally. I reached the peak [of infection] and my sister was my pillar of strength. We used to talk on the telephone all the time.” [P13]

The aforementioned excerpts describe family bonding during the hard lockdown in South Africa. While the pandemic and the related lockdown were largely viewed as stressful situations that caused trauma across the globe, there was clear evidence that families bonded during this time. The lockdown forced people to spend time with each other and therefore provided people with opportunities to connect with each other with few distractions imposed on them. It was clear that during normal circumstances before the pandemic, people were tied down by the responsibilities of life. However, the lockdown caused people to speak more and connect with one another, thus strengthening family bonds. The lockdown was also seen as a positive measure, as children were home from school, which allowed parents to become closer to their children.

The use of technology like phones further strengthened family bonds because of its ability to connect loved ones to each other despite the distance. The notion of family bonding is seen as a positive factor and therefore points to the idea that it can counter the effects of fear, anxiety and distress. The pandemic was distressful; however, the positivity that family bonding brought helped people maintain good psychological health. This is significant among those with co-morbidities. While family bonding was evident across both samples of this study, it seemed to be significantly beneficial to those

infected by the virus because the infection period was viewed as difficult and connecting with a family member during that strenuous time proved to be a source of strength.

The empirical literature indicated similar findings. Evans *et al.* (2020) explored the impact of the COVID-19 pandemic on families through a qualitative study consisting of 2 130 participants. They reported that families in Australia embraced the positivity of the lockdown, as families became closer and communicated more during the lockdown. Further, they noted that fathers spent more time with their children. Alfawaz *et al.* (2021) found through a survey conducted in Saudi Arabia with 1 542 study participants that the COVID-19 pandemic and lockdown provoked anxiety and depression, but also brought benefits of family bonding. Their study also indicated 75.3% of their respondents found the lockdown to improve family bonds and relationships while adding to family time spent together. They mentioned that strong family bonds can mitigate the effects of psychological distress and promote resilience. A qualitative study in South Africa identified that the lockdown improved family relationships through increased family time spent with each other (October *et al.* 2022).

Grevenstein *et al.* (2019) emphasised that good family relationships can be a protective factor for well-being. Furthermore, it was noted that a good relationship between family members accounts for higher resilience and less mental distress. With respect to the use of the cell phone and its ability to promote family bonding, a study by David and Roberts (2021) found through a survey of 400 university students in the USA that the use of smart phones increased the sense of connection between people, but it was not as promising as an in-person interaction. The use of smart phones has had a positive influence on people.

One participant mentioned bonding through conversation and reflecting on personal issues. He said:

“I did spend a lot of time with my sister. We spoke about what she’s going through and work, what my current plans are, [and] whether I’d relocate after I study.” [P26]

The aforementioned excerpt showed that the lockdown promoted conversation between family members as people had more free time. It was evident that the participant was

given an opportunity to strengthen relations with a loved one through communication. Therefore, by improving communication, there is heightened family bonding. During periods of difficulties or distress, communication is effective in safeguarding the emotional well-being of people. This is achieved because effective communication acts as a coping mechanism, giving people the ability to handle stressful situations (Geçer and Yıldırım 2023).

The literature showed that the quarantine allowed people to increase conversation and communication (Ye 2020). Sabah *et al.* (2023) conducted a cross-sectional study that assessed the role of communication in families during the COVID-19 quarantine by utilising a sample of 359 participants. The participants of their study were both Algerian and Iraqi, who perceived family communication as a means to adapt to crises and cope with the stress of the pandemic. Furthermore, families who communicated effectively were able to handle COVID-19-related grief and trauma.

4.4.6.2 Sub-theme 6.2: Family conflict

Sub-theme 6.2 described the family conflict that occurred during the lockdown. In addition to family bonding, participants also reported on conflicts between family members during this period. The lockdown confined people to their homes and resulted in quarrels and fights. One participant shared how the economic hardships and confinement led to marital arguments:

“Did have some conflicts. Being at home all [the] time as an only provider, now you need to provide for the kids. So, there were a lot of quarrels between my wife and I because of providing for the kids and trying to make a plan to get food on the table.” [P07]

The lockdown had forced people to be trapped with those that were the source of their discomfort, as one participant shared:

“It is hectic because I don’t get [along] with my son and my husband don’t get [along] with my son. He’s a very hectic guy. He’s forty; he shouldn’t even be living with us.” [P09]

The proximity of residents within the home sparked disagreements and troubles during the lockdown. The participants expressed that being close to one another all the time led to moments of conflict:

“I think there’s more conflicts. Because you [are] on top of each other, you know.” [P13]

“Obviously, being 24/7 in each other’s faces, we did have some hectic moments where conflicts did arise. But at the end of the day, we knew that tensions are just arising and conflicts are arising because we are stressed out.” [P25]

Another participant reflected on the conflict between her and her husband due to her need to be more hygienic during the pandemic. She said:

“It did cause conflict and it did affect our relationship at home, even with my husband. He would be so angry that I am so paranoid that even if you buy a loaf of bread, it must stay outside until it’s sanitised and then bring it inside. Even your shoes—don’t come inside the house with shoes. He would be so upset, where sometimes he smokes cigarettes and sometimes, I’ll be like, but you need to stop that because it’s going to affect your lungs and you’re going to get COVID and then somethings going to happen to you.” [P16]

One participant narrated how his brother distanced himself from the family because of a misunderstanding. He said:

“During this time, one of my brothers pulled away from the family because they were sick and they [brother] felt like no one could come to them to help them. So, they were far away from us all. So, we [are] still trying to get back to them.” [P05]

The excerpts above reflected the family conflicts that had occurred during the lockdown. Participants became hostile towards each other due to being forced to

spend time with each other. There was evidence of quarrels that had occurred between married couples because of their financial circumstances. The lockdown had presented considerable challenges for parents in providing for their families. The data showed that fathers were seen as the breadwinners and therefore were the target of conflict when their ability to provide was dismantled by the socio-economic decline. Furthermore, adding to the idea that marriages were strained during the COVID-19 pandemic. Conflicts also arose between couples regarding hygiene and maintaining the hygiene of their home. This points to the paranoia and fears that people had relating to the risk of COVID-19 infection.

The lockdown also exacerbated pre-existing conflicts between family members, as outlined in the data. Previous strained relationships, only worsened through the forced co-existence that was imposed on the family setting. The sudden restrictions in movement resulted in people having to adapt in a short space of time to living in a confined manner with multiple people. Further, the stress from the pandemic itself only compounded these challenges.

Misunderstandings within the family unit also contributed to conflicts. Family conflicts were seen as a negative effect of the lockdown and pandemic. The conflict within the family unit exposed people to psychological distress and therefore affected their well-being. Family conflicts were not limited to one study sample as both the infected group and affected group faced family conflict challenges. Additionally, as these were participants had co-morbidities, this added factor of family conflict could have had a negative influence on their well-being.

The literature reflected similar findings as those reported by Ignasia, Shinta and Annastasia (2021) in a systematic review indicating that elevated levels of conflicts between married couples during the lockdown. Couples with low socio-economic status experienced higher levels of conflicts compared to those with higher socio-economic status. The justification for this was that losing their jobs during the lockdown could have affected their relationships. The effects of economic decline can legitimately cause of distress in people, leading to conflicts within the family setting and marriages (Behar-Zusman, Chavez and Gattamorta 2020)

Martínez-Líbano (2023) noted from a systematic review that confinement can increase stress and cause anxiety; further, they observed that confinement can induce fears of

infection. Additionally, it can create uncertainty regarding the ability of the family to meet basic needs due to the effects of the economic disruptions. Guo *et al.* (2020) added that family conflicts occurred in China during the lockdown due to disputes on how to protect oneself from infection.

The area of communication is a significant factor in family well-being. Good communication allows proper dialogue to establish support and rules within the family. However, a lack of proper communication can cause misunderstandings (Tam *et al.* 2021). Ultimately, the effects of family conflict can result in a negative influence on physical and mental health with resultant effects on blood pressure and mental distress (Borst 2015).

4.4.6.3 Sub-theme 6.3: Activities within the home during the lockdown.

Sub-theme 6.3 presented the increase in activities among participants during the lockdown. The participants mentioned that they listened to music, engaged in computer activities, watched movies, cooked, learnt new skills and helped with tutoring. They said as follows:

“Just the music. Maybe watching movies.” [P03]

“I was literally playing computer games.” [P20]

“It was an adventure; watched the news; watched people be scared; I was scared to; it was something new for me—reading.” [P24]

“Netflix, YouTube, TikTok, looking for recipes, cooking recipes, trying out baking. I would watch make-up tutorials. I learned how to cut my hair. I learned how to take care of my skin. I read a lot.” [P25]

“We would do a lot together. Cooking.” [P18]

"I did spend some time with my nephews, tutoring." [P26]

The data reflected that the participants had kept busy during the COVID-19 lockdown by utilising their free time to do various activities. While the lockdown was challenging, participants viewed it through the lens of adventure as a new experience. Some saw the lockdown as a means to learn new things and ultimately gain new skills. The use of technology was another means of providing people with entertainment, especially through the use of social media. The utilisation of the free time people had can be viewed through a positive lens, as it allowed people to establish a new routine and possibly provided them with a distraction from the negativity of the pandemic.

Sarda *et al.* (2022) indicated through their study of 2 422 French citizens that during the lockdown period of two months, there was an increase in cooking. This was evident among 42% of their respondents. Additionally, over 70% of the participants admitted to attempting new recipes, while 67.1% attempted baking. The reasons for the rise in cooking were more available time from reduced working hours and people trying to eat healthier. Through a survey of 781 participants, Barr and Copeland-Stewart (2022) provided evidence that showed an increase in the frequency of people playing video games during the lockdown. This allowed people to relieve their stress and escape the reality of the pandemic while providing them with a distraction.

The use of social media had increased during the pandemic, which also correlated to having an increased sense of positive support as social media allowed people to overcome feelings of anxiety and loneliness (Cho *et al.* 2023). A survey of 3 055 people in Spain found that there was an increase in leisure activities during their lockdown. The use of social media increased by 85.2%, while 79.1% of the participants watched television as a leisure activity, while reading was reported by 52.4% of the respondents. Additionally, the rise in leisurely activity reduced mental stress in people (Rodríguez-Rey, Garrido-Hernansaiz and Collado 2020).

In accordance with the findings of this study and the subsequent literature, there is evidence to support the use of leisurely activities in alleviating the ill effects of the COVID-19 pandemic. This is beneficial to those with co-morbidities as it promotes well-being.

4.4.6.4 Sub-theme 6.4: Family and friends as a support structure

Sub-theme 6.4 encapsulated the role of family and friends as a support structure, illustrating their significance during the COVID-19 pandemic. Participants reported on how friends and family helped them during the COVID-19 pandemic. A participant noted that he received support from friends. He said:

“So, I appreciated that I had help from friends who had COVID [and] supported me with medication as well.” [P12]

The act of communication and familial support was a source of strength. One participant found her family to be a stronghold for mental wellbeing:

“Coming from a supportive family that I have, talking to my siblings and my parents and with their help, I’ve overcome a lot of mental challenges at the time.” [P16]

The COVID-19 pandemic was a period of hardship and disappointment however, the unity between family members provided a sense of solace. One participant who became unemployed found support from his father, who provided encouragement through a difficult time. He said:

“It did take a toll on us. Put a lot of stress on my dad as well; he understood that I didn’t deliberately go and do it [lost job] and the fact that he acknowledged and he told me you know what you provided all this time, you worked. He’s like you never missed a day, so he said just take it easy. We’ll get through this, so he didn’t put any pressure on me as well at that time.” [P12]

As evidenced in the data, there was a common finding that revolved around family and friends as a support structure. Friends became supportive by helping with the purchase of medication. The family was seen as a buffer against the harmful effects of psychological distress related to the pandemic. Parents became supportive and assured their children of their presence amidst difficult times. The role of family and friends during the COVID-19 pandemic was that of strength and comfort. Patients needed their loved

ones to help them feel supported and cared for. It is evident that the role of family and friends negated the stressors of the pandemic and offered them hope and peace of mind. This, in turn, allowed them to become stronger.

The literature supported the findings of this study, as Yang *et al.* (2022) noted that during times of distress, family support can help people overcome the challenges of anxiety and emotional distress. Further, the literature also mentions that parents can help their families remain resilient. Their study found that family support improved mental health. Research further corroborated that supportive parents can decrease stress during the pandemic (Vanderhout *et al.* 2020). Rapelli *et al.* (2020) had conducted a study in Italy, which had a sample size of 1 921. They reported that both healthy people and people with co-morbidities have higher levels of mental well-being when they have supportive friends, families and partners.

This study provided evidence that patients who were previously infected by SARS-CoV-2 recalled the support they received from family and friends during their periods of difficulty. Therefore, an assumption can be made that the virus deepened their need for emotional support from loved ones. The literature, in combination with the data of the current study, provided a basis of evidence to suggest that having good supportive relationships from friends and family can help overcome challenges related to the COVID-19 pandemic.

Participants noted that they had shared responsibilities in their households during the lockdown, which contributed to the support between family members. Some said:

“In our home, it was everybody pulling their weight. Everybody [was] making sure that we were all taking care of each other. It was not just one person doing everything because, at that time, we all needed support and we all needed care. So, we all made sure we took care of our household duties.”
[P25]

“There were times when I also had to chip in; I had to tutor my nephews.” [P26]

The data reflected that during the lockdown period, families had begun to support each other by sharing responsibilities within the household. This form of added support was necessary in the home, as people needed their families to stand together to achieve solidarity. Helping around the house allowed the burden of the COVID-19 pandemic to be shared among the family, which contributed to their well-being.

The lockdown had re-defined the distribution of household duties among families, as there was a shift in the roles among members of the family (Pino Gavidia *et al.* 2023). Biroli *et al.* (2021) conducted a survey across the USA, UK and Italy with a sample size of 3 157 participants. They had identified a rise in the sharing of responsibilities within the home, such as childcare and household tasks. However, those partners who became unemployed or worked from home seemed to have added responsibilities.

4.4.6.5 Sub-theme 6.5: Caring for loved ones

Sub-theme 6.5 reflected the care of loved ones among family members during the pandemic as they took on the role of a caregiver. A participant illustrated how he cared for his wife and daughter when they were infected with COVID-19. He said:

“My wife and my daughter used to have that COVID... I did everything; I touched their hands; I carried them; that’s my wife at the end of the day; and that’s my daughter. So, I was with them at all times, dressing their beds, making sure everything was clean, put them to bed, covered them... I was massaging them. There was no shame... I did what I was supposed to do for my family.” [P03]

Participants mentioned the challenge of being infected and having to take care of those simultaneously infected at home. They said as follows:

“When everybody is not well, I’m the one to look after them [the family] and make sure they got their medication and go to the pharmacy. It so happened that all of us got COVID at the same time. There were days where I would feel better and try to sort things out. It was difficult to have all three people infected at the same time.” [P17]

“I had to take care of him; he had to take care of me... It was a strain being a housewife and taking care of your husband. It was a very big strain. I couldn't cope up, if I had other things to do, like seeing to the clothing, seeing to the ironing or something, I couldn't do it. It was too tiring for me.” [P11]

Participants took care of loved ones who were infected with the virus during the pandemic. The fact that their family members were infected with COVID-19 did not deter them from providing care and support during the challenging times and they alluded to the positive role of family in troubled times. Additionally, the participants were a vulnerable group who had co-morbidities, but that did not affect their ability to care for loved ones that were infected with the virus. The major feelings of the participants were positivity and peace of mind. However, some participants reported on the added strain they experienced in relation to caregiving during the pandemic, especially with the other responsibilities that they had to take care of. People are usually busy with normal obligations in their personal lives; therefore, providing care for loved ones during the pandemic could be interpreted as a burden that affected their ability to function normally.

Care-giving during the pandemic by loved ones such as family members or relatives was a helpful asset to the healthcare system, as people were able to stay at home under the supervision of their caregiver (Dixe *et al.* 2019). The role of a caregiver is to provide support to the ill by helping with meals, shopping and the buying of medication, among numerous other aspects (Bergmann and Wagner 2021). Mishra *et al.* (2023) explored the aspects of caregiving that illicit feelings of positivity. Their study had a sample of 100 caregivers in India. They had found that caregivers found a sense of purpose in their roles. Additionally, they had compassion for their patients, experiencing feelings of love and joy. Furthermore, some saw it as an accomplishment that added to their well-being. Beach *et al.* (2021) found that caregivers also experienced anxiety and stress. Additionally, they found that caregivers struggled during the COVID-19 pandemic with obtaining medication and providing efficient care, among other factors. Similarly, Rahimi, Dastyar and Rafati (2021) conducted a study that used a phenomenological method with a sample of 13 participants. They identified the challenges that caregivers faced while taking care of COVID-19 patients, such as difficulties in seeking medical care, obtaining

medication and dealing with financial difficulties. Their study further showed that caregivers had experienced problems with mental well-being through distress and issues around physical well-being like insomnia and fatigue.

4.4.6.6 Sub-theme 6.6: Bereavement during the COVID-19 pandemic

Sub-theme 6.6 explored bereavement during the COVID-19 pandemic. As part of the pandemic, people had to deal with bereavement through the death of loved ones. This can be seen in the following excerpts:

“I just lost my friend, a very close friend. He was everything to me; ... he was. Just say he was the world to me. We were so close... I was hurt; I dropped a lot of tears. I still only think about him, no matter where I am. He’s a lot for me and I still think about him.” [P03]

“My husband’s sibling passed on; you know, he just had so many dreams and he was just getting on par with everything, just to suddenly hear ... It’s something so devastating because we never, in our wildest dreams. thought that he will pass on; it was an absolute shock.” [P13]

A participant also mentioned how her ability to grieve had changed during the COVID-19 pandemic. She said:

“There were people that were close to us that we were losing. The sad part is that we couldn’t attend funerals. We couldn’t pay our last respects, or gain closure, or be there for our own family members.” [P25]

As mentioned in the preceding excerpts, the participants experienced grief due to the many deaths of loved ones that occurred during the pandemic. The emotions people experienced were sadness and devastation. People had lost friends and family members, which affected their mental well-being. The sudden circumstances surrounding the deaths of loved ones induced a shock among people. Additionally,

due to movement restrictions and social distancing measures, the conventional grieving process was drastically affected. Therefore, people were not able to achieve peace of mind and provide support for their loved ones. It is perceived that the deaths that occurred during the pandemic affected the psychological health of people, which indicated that it had caused anxiety, panic and decreased resilience in people. This can be harmful for people with co-morbidities.

Research showed that grief was rife throughout the pandemic, as the deaths of loved ones had occurred all around. The deaths of family members and friends caused significant psychological distress (Arora and Bhatia 2023). In the South African context, the grieving process was affected as COVID-19 restrictions prevented families from attending funerals, touching the bodies of the deceased and hosting after-tears parties (Kgatlle and Segalo 2021). Chen (2022) conducted a study in the USA. The author recruited 519 participants and compared the differences between people who attended funerals virtually and in person. Their study found that a grieving person can experience emotions of shock, guilt and sadness. Furthermore, the pandemic and the social distancing protocols drastically affected the way in which people grieved. In addition, individuals unable to attend funerals experienced a complicated grieving process, which often resulted in a prolonged grieving period.

These challenges could significantly amplify harmful effects on the well-being of people with co-morbidities. It can be assumed that the unrequited bereavement process was a factor that promoted psychological distress in the participants, and therefore, could have affected both mental and physical well-being.

4.4.7 Theme 7: Healthcare during the COVID-19 pandemic

The seventh theme related to healthcare during the COVID-19 pandemic. The sub-themes that follow are:

- The experiences of patients at healthcare facilities;
- The challenges of patients obtaining medication during the lockdown period;
- Perspectives revolving around vaccination against SARS-CoV-2; and (4) Holistic treatment and therapies for COVID-19.

4.4.7.1 Sub-theme 7.1: The experiences of patients at healthcare facilities

Sub-theme 7.1 explored the experiences of patients at healthcare facilities during the pandemic. One of the concerning issues participants reported were the queues at the facilities. Participants indicated that queues were longer during the lockdown. They said:

“We follow the queue, about 4 o’clock in the morning. Have to stand there [until] about half past six [until] about 7 o’clock. You have to get a card.” [P01]

“I had to wait very long. People were coming to do the test [COVID-19 test]. Some people came to do the test and go. I had to wait quite a while.” [P06]

Participants attributed the extended queues and wait times to the collection of COVID-19 medication by those infected with virus and the various streams of medicine collection. They said:

“A lot of people were coming to get COVID medication that they needed. They were actually first preference.” [P16]

“It just depends on what treatment, and I think, from my understanding, clinics have different streams. Like people come they see acute and chronic. So, there was some confusion at that time. Definitely, the queues were longer. The waiting period was definitely longer as well.” [P13]

Some participants attributed longer waiting times to the implementation of COVID-19 protocols at healthcare facilities. They said:

“It was very long. It was a bit more complicated than normal. You must follow the line and go and give a whole of details, whether you are coughing and sneezing.” [P18]

“During COVID, getting into the hospital was a nightmare—the screening process. Our weather conditions are so rapid, we had to wait outside and we

were waiting in queues for about 20 minutes before we can enter, so that means I had to go very early in the morning.” [P25]

As evidenced in the excerpts above, participants felt that there were longer wait times at healthcare facilities. There were many reasons for this occurrence, as it was noted that clinics were conducting COVID-19 testing, which caused extended waiting times. The clinic was also treating COVID-19 patients and those patients were prioritised, which delayed the treatment of people with co-morbidities. Clinic queues were also longer depending on the day as the clinic saw different streams of patients for various treatments on different days, which contributed to an increase in waiting times. The data also reflected that participants' waiting times were increased because of the strict COVID-19 screening policies implemented at the healthcare facilities. While these procedures were implemented for their safety, they negatively impacted the patients' overall experience and satisfaction. The conditions under which patients waited in queues were perceived as unfavourable, as they waited outside during bad weather.

The public healthcare system in South Africa is vastly overburdened with large numbers of patients and limited funding. Additionally, staff constraints and poor management of the facilities add to the complications in the management of patients' healthcare (Mahomed and Asmall 2015). Kagura *et al.* (2023) conducted a cross-sectional study in Johannesburg, South Africa, which comprised 2 429 patients with chronic diseases. They had found that patient satisfaction largely depended on waiting time at the healthcare facilities, with patients who waited longer, being proportionately more dissatisfied. They added that this is largely affected by the number of patients seeking care, staff constraints and administrative procedures in place.

Siedner *et al.* (2020) reported from a time series analysis study in KZN that during the level 5 lockdown, clinic visits for chronic medication remained constant or slightly elevated. Thereby, providing a reason for the longer wait times. Danhieux *et al.* (2020) provided insight into chronic patient care in Belgium and reported findings from 21 healthcare professionals through a qualitative study. They observed that the pandemic caused major disruptions in chronic patient care as their care was not prioritised as compared to COVID-19 patient care. Measures need to be implemented to improve both chronic patient care and satisfaction.

Other participants felt the clinic queues were shorter during the lockdown. Their experiences depended largely on the times they attended the clinic. They said:

“Actually less, less queues, less people were coming.” [P09]

“They had social distancing; I remember at one stage, I just had to come outside to stand in the sun. I saw the lines; you could say it was a bit short, but because of the social distancing it made it seem like they were busy, you know, because of the distance.” [P12]

“I used to come early. I know the time. I know the procedures of this clinic. You come early; you finish early.” [P03]

A contrasting view that was reflected in the data was that some patients felt their waiting times were shorter due to fewer people attending the clinic. Patients felt that if they went to the clinic earlier, they would be seen faster, especially if they understood the protocols of the clinic. Woodruff and Frakt (2020) noted that in American emergency rooms, there was significantly lower patient foot traffic during April of 2020 as compared to the same period in 2019. The reasons for this were the implementation of good operational strategies, reduced injuries because people were on lockdown orders and people's fears around the risk of infection that prevented them from seeking care. Abrahams, Thani and Kahn (2022) reported through a contextualised article that patients who understood the triage system of a health facility were generally more satisfied with healthcare because they understood the procedures.

The data illustrated various challenges that healthcare facilities had, which ultimately served as barriers to adequate healthcare for patients with chronic diseases. Areas around staff constraints and the availability of the healthcare facilities affected the quality of care patients received. A participant who was hospitalised during the peak of the pandemic from a gastrointestinal problem reported as follows:

“Staff was limited at the hospital; facilities were limited; beds were limited. For me to even get a room, I think it was booked three or four days before. So,

there was a very big worry that we weren't going to get attended to because resources were limited... priorities were COVID and the COVID patients [themselves]. Doctors were not as attentive as you are used to because I assume they were also [cautious].” [P18]

Another participant mentioned that due to limited staff, it was difficult to gain access to the clinic. She said:

“There [were] time constraints because health facilities were open at a particular time [and] closed at a particular time. The other thing is that when we go to the facility, it was not easy to get access because of staff constraints as well.” [P13]

One participant reported that her appointments were cancelled. She said:

“In terms of medical care, I think it could have been handled better. Pap smears and things were not emergency, I understand it wasn't emergency cases, but it should have been important as well because in those normal check-ups, they normally send you for bloods, to see if your health has changed, whether your medication needs to be changed.” [P17]

The three excerpts above reflect that participants had a negative impact on their healthcare. During the peak of the COVID-19 pandemic, healthcare facilities became inundated with the influx of COVID-19 patients and this shifted the focus of healthcare from non-COVID patients. Staff constraints and the availability of rooms and beds made hospital stays very difficult for patients with co-morbidities. The lack of attention from the medical staff also proved to be a negative factor in the lives of patients, as they felt neglected. Healthcare facilities were strict with their operation times, which made it an inconvenience for participants to receive adequate care timeously, if they were not attended to on that day. Even elective procedures were not seen as a priority, which caused concern for patients as they were unable to know the status of their health. The overall feeling from the participants is that they were neglected because they were not COVID-19 patients seeking treatment for either their chronic condition or other ailments.

Hassan and Arawi (2020) mentioned in a review that non-COVID patients were neglected during the pandemic, as people were turned away from healthcare facilities. They also noted that even patients with suspected conditions like TB were not attended to because of the constraints that hospitals faced during the pandemic, which did not allow for procedures such as MRI scans to confirm diagnoses. Clerk (2021) provided insight into the healthcare of non-COVID patients during the pandemic era and reported that these patients were dramatically affected. The patients were being turned away for treatment due to hospitals becoming COVID-19-only treatment sites, staff constraints and limited supplies.

Mboweni and Risenga (2023) conducted a qualitative phenomenological study in South Africa. They interviewed 28 participants with chronic diseases and found that during the pandemic, the care of patients was subpar. They ascertained that patients were not attended to adequately due to staff shortages. Furthermore, they added that medical staff did not attend to the patients as they did before the pandemic. Additionally, due to limited staff, some of the patients were not attended to. Hagenbeck *et al.* (2023) reported findings from an online survey of 860 gynaecologists in Germany. They had found that during March and April 2020, gynaecologists had cancelled more than 50% of their cancer screening appointments.

4.4.7.2 Sub-theme 7.2: The challenges of patients obtaining medication during the lockdown period

Sub-theme 7.2 endeavoured to find out how people obtained medication during the lockdown. Some participants had trouble obtaining their chronic medication at the required time due to the COVID-19 pandemic. They reported that the clinics were closed.

“It was closed most of the time, so I wasn’t getting my medication. So, I had to wait for a while. Then I came to this clinic not very long ago.” [P11]

“There were times when the clinics were closed. So, it did affect my collection time. ... So, it meant coming like a day or two later, sometimes a week later.” [P13]

The excerpts above reflected that there was a disruption in the supply of medication at healthcare facilities. Participants noted that the clinic at which they collected their medication was closed at certain intervals during the pandemic; this inconvenience caused them to retrieve their medication later than usual. A mixed-methods study that was conducted in the Eastern Cape, South Africa, by Orr, Hajiannis and Motuba (2023) assessed antiretroviral (ART) treatment in patients. They found that due to constant COVID-19 infections among staff members, clinics were often closed, which affected the treatment of HIV patients.

The participants noted the various challenges while collecting their medication. There were considerable impacts on medication stock, which led patients to purchase medication privately. They said:

“I couldn’t get to the clinic to get medication. I should have a month-to-month supply and then I had to purchase the medication from Clicks at that point in time, when the first COVID [first wave] was and thereafter I started getting two months’ supply from the Grove End Clinic.” [P08]

“I had to ask for a private prescription; however, because my medication was not available at any pharmacy, looking around for a specific pharmacy that keeps my medication was a bit difficult.” [P25]

The aforementioned excerpts indicated that participants were affected by the effects of limited medication supplies. The disruption of chronic medication caused people to purchase their own medication, which ultimately caused them to incur financial costs. The participants were only attending public healthcare facilities due to financial constraints, so the added burden of having to buy their own medication can be assumed to be challenge. Another issue with the limited stock of medication was the difficulty of participants having to find pharmacies that would sell their medication. This further added to the challenges they faced.

Mboweni and Risenga (2022) observed through a systematic review of 17 articles that during the pandemic, there were patients who faced challenges around a lack of

medication supply. These patients had to purchase their own medication or return to the facilities on a different day. However, patients would sometimes not return, which affected compliance with treatment. Yemeke *et al.* (2023) interviewed 36 participants in a study in Zimbabwe to assess the medical supply chain. Their study yielded results that showed that the COVID-19 pandemic disrupted the supply chain of medical supplies, including medication, due to the effects of currencies, logistics freight costs and restrictions that were implemented on exports and imports.

The data also indicated that participants had begun to share and borrow medication because they could not collect their own medication:

“They used to get their medication on medical aid. Then I was taking their medication.” [P11]

“Sometimes my brother is on sugar as well. So, he gets his from medical aid, so sometimes if I don’t get, I get from him.” [P12]

The data reflected that patients began to share medication during the lockdown, which could be detrimental to their health and well-being. The literature on the sharing and borrowing of medication during the COVID-19 pandemic was scarce. A qualitative study that was done in Croatia assessed the responses from 15 medical doctors. They had found that 80% of the medical doctors were aware that their patients were sharing prescription pain medication. Additionally, the doctors found this behaviour to be risky to the patient’s well-being (Markotic and Puljak 2016).

Despite the negative effects that the COVID-19 pandemic had on medicinal supplies. There was a bright side, as the clinic eventually started distributing an extra supply of medication. One patient said as follows:

“[At] the beginning, things were not right at clinics. Then they came to a settlement. They gave us for one to two months or three months’ supply.” [P04]

One participant was able to purchase non-chronic medication online. They said:

“I’m glad there were online service deliveries as well. Which I made full use of.” [P26]

The excerpts above reflected that healthcare facilities eventually updated their protocols to provide chronic patients with an extra supply of medication to mitigate and prevent patients from attending the facilities unnecessarily. This benefitted the lives and well-being of patients immensely. There were other options to obtain medication using online pharmacy platforms, which made things convenient for people. This also benefitted participants, as they could avoid the risk of infection by shopping online.

Lalla-Edward *et al.* (2022) identified similar findings in their study that looked at service delivery in South Africa during the pandemic. They had interviewed 42 community members and 43 healthcare workers and reported that during the pandemic, patients were given an extra supply of chronic medication. The literature also showed that at the start of the COVID-19 pandemic, there was an increase in online purchases of medication. Vitamins and minerals, cough suppressants and anti-inflammatories were some of the medication purchased online (Jairoun *et al.* 2021). Thaba, Jacobs and Laby (2023) identified through a content analysis study in South Africa that people used online pharmacies during the pandemic; however, customer satisfaction was sometimes disappointing as the online system’s would not update their catalogue efficiently when certain items were out of stock and the sites were not always user-friendly.

Participants reflected on travel challenges during the pandemic and how this hindered their ability to collect their medication. A participant with a stroke (CVA) mentioned the difficulties of travelling to the clinic to collection. He said as follows:

“Because the clinic was only taking a certain amount of people at the time and I had transport issues. I used to walk and it used to take me a long time to walk to the clinic. When I used to come to the clinic, they should only take a limited people.” [P08]

Another participant revealed the difficulties of travelling to healthcare facilities for chronic medication because of travel restrictions. She said:

“We had so much of restrictions during lockdown, where we could not have free movement, so that was a bit of an issue. So, whenever my dad had to go fetch my medication, he had to show proof of my medical card and the prescription... just so we can gain access to certain areas.” [P25]

The aforementioned excerpts revealed an additional challenge for patients with co-morbidities while collecting medication. Having a chronic illness was problematic, as it served as an obstacle to retrieving medication at the required time. This was likely due to the co-morbidity causing poor physical health for the participant and impeding their ability to move around efficiently. The lack of transport caused further challenges, as the implemented travel restrictions during the lockdown also affected participants abilities to collect their medication. This further imposed a barrier to healthcare for patients with co-morbidities as it hampered their ability to collect medication on time.

The literature evinced that chronic patients had challenges with transportation. This impediment can serve to restrict access to timely healthcare services, which was further exacerbated by the COVID-19 pandemic (Pillay *et al.* 2022). Furthermore, transportation challenges caused patients to miss appointments, miss important medication and become non-adherent to treatment (Mubaiwa and Mokonyama 2017). Musoke *et al.* (2023) conducted a study in Uganda with 175 participants and reported that chronic patients were severely affected by lockdown restrictions during the pandemic due to travel restrictions. Furthermore, patients with chronic diseases had deleterious consequences for their physical health, while some patients succumbed to their illness and passed on.

4.4.7.3 Sub-theme 7.3: Perspectives revolving around vaccination against SARS-CoV-2

Sub-theme 7.3 explored the perspective of patients with co-morbidities regarding COVID-19 vaccinations. They shared their views, as follows:

“Even though we had our vaccines, even our booster, we still got COVID.”
[P23]

“I’m grateful that when I had COVID, I did not clot because obviously the medication that I’m on prevents any type of clotting. I was also vaccinated, so that would have helped in some way.” [P25]

The excerpts above indicated that participants were accepting of the COVID-19 vaccination, even though they had chronic diseases. They seemed to have taken it regardless of their co-morbidities. The vaccine was perceived to have lessened the severity of infection and prevented drastic interactions with chronic diseases. However, it was also viewed as ineffective in the sense that while the vaccine was taken, it still allowed for infection. Additionally, it was thought to have caused side effects.

Jiang *et al.* (2022) reported findings from a cross-sectional survey that consisted of 998 participants; they found that patients with co-morbidities were more accepting of the COVID-19 vaccine due to their perceived risks of infections. However, their study participants were also concerned about whether the vaccine would interact with their conditions. Ojewale and Mukumbang (2023) found through a qualitative study in Nigeria that people with chronic diseases were hesitant about receiving the COVID-19 vaccine due to safety risks, a lack of knowledge about the vaccine and ineffectiveness of the vaccine.

4.4.7.4 Sub-theme 7.4: Holistic treatment and therapies for COVID-19

Sub-theme 7.4 focussed on holistic treatment and therapies that participants used during their period of infection with SARS-CoV-2. There were numerous reports on the use of alternative or holistic therapies to prevent infection or treat the symptoms of COVID-19. Participants responses were as follows:

“As soon as COVID started, I started with my vitamins, like you know, vitamin C, zinc; I took vitamin D once a week. Then I used to take garlic pills. Then I started taking a whole garlic at home, chopping it up. Then I used ginger, fresh

ginger in tea. That kind of a thing and then you know the drumstick leaves.”
[P13]

“Garlic mostly because that’s what people were talking about... multivitamins; I did that also.” [P07]

“We used to drink a lot of herbal remedies, ginger water, boiled ginger water. A lot of people said, milk and ginger tea. You know everything in ginger.” [P08]

“My mum would make a lot of home remedies. Steaming even when we didn’t have COVID, we just did it as a precautionary measure in case we did contract the virus. A lot of immune-boosting drinks, which was aside from the western medication.” [P18]

“I was inhaling mentho crystals to help with my chest and to open up my air passages. I did get a lot of sunlight. I did breathing exercises.” [P25]

As evidenced in the preceding excerpts, participants utilised holistic and natural therapies for the prevention of COVID-19 and its treatment. A significant finding was the high use of supplements that people began to purchase in the hope of strengthening their immune systems. There was a high consumption of garlic and ginger, which were consumed in various forms, namely teas, pills and even whole. Additionally, there was the use of the drumstick leaves, sunlight exposure and breathing exercises. Patients put a lot of trust in these holistic forms of treatment and identified these substances as a means of protection.

The participants consumed these supplemental medicines in a strict manner and were reliant on them for achieving good health. Additionally, they started to adopt these forms of treatment through word of mouth, as people were likely talking about the benefits of these remedies. Most participants who utilised alternative remedies were from sample 2. This can be due to their perceived risks of having a co-morbidity while being infected

by the virus and their willingness to try additional therapies in addition to western medicine, as one participant explained. Furthermore, it appeared that parents would prepare these medicines for their children. By deduction, it can be assumed that the use of home remedies was passed down through the generations.

The use of complementary and alternative medicine (CAM) and traditional medicine (TM) has been on the rise globally during the COVID-19 pandemic. Furthermore, their use in Africa is extensive as people are more reliant on this form of therapy due to their relatively low cost (Paudyal *et al.* 2022). In South Africa, Mphekgwana, Makgahlela and Mothiba (2021) conducted a survey at a university in Limpopo and found that 30.4% of its respondents utilised TM during the pandemic as a means of treatment, either due to rescheduled medical appointments or the effects that the pandemic had on mental health.

An Ethiopian study that assessed the use of TM among households during the pandemic found that 46.2% of the study participants used TM during the pandemic either as a means of treatment or as a preventative measure. Additionally, they found that ginger and garlic were commonly used (Umeta Chali *et al.* 2021). Li *et al.* (2022) reported findings from a randomised control study in China that assessed the length of hospital stay in 227 hospitalised patients who used ginger as an adjunctive to the normal treatment. It was reported that the hospitalisation time of patients with COVID-19 decreased. This was supposedly due to the anti-inflammatory properties of ginger on the lung. Sunlight exposure has a positive effect against viral infections, as it increases vitamin D production, which elevates immunity and stimulates the healing of respiratory diseases (Asyary and Veruswati 2020). *Moringa Oleifera*, also known as the drumstick tree, has many antiviral and immunomodulatory effects, which can be a candidate in the treatment of SARS-CoV-2 infection (Fajri 2021).

Participants also used alternative medical practices, like ayurveda and reiki.

“I would say that’s the only thing like those breathing exercises, yoga, some ayurveda practices.” [P16]

“I’m very into alternate remedies. I don’t only rely on tablets... the reiki, which helps immensely.” [P09]

The excerpts above reflected that the participants employed alternative therapies in the form of yoga, ayurveda and reiki to assist them in their treatment regimen against COVID-19. These forms of complementary medicine benefitted the participants and provided relief for their condition. It was also reported that they did not rely completely on their mainstream treatment but used these alternate medical practices as adjunctive.

Yoga is an old technique that promotes good health and well-being of the mind and body through the equilibrium of these different spheres. Furthermore, patients with chronic diseases are said to benefit from yoga through its ability to improve immune function, mental well-being and survival rate (Capela Santos *et al.* 2023). A study was conducted in India with 23 290 participants divided into two groups, namely yoga and non-yoga. The study reported that the yoga group fared much better during the pandemic with regards to managing stress, sleep and attaining good mental well-being.

Girija *et al.* (2022) reported findings from a study in Chennai, India, which included 167 COVID-19 patients. The patients had been treated with ayurvedic medicine, and among them 60 had co-morbidities. These findings showed that treatment with ayurveda resulted in the resolution of COVID-19 symptoms in both chronic and non-chronic patients within six days. Furthermore, the use of ayurveda in patients with chronic illnesses was proven to be safe and effective.

Supplements had begun to become scarce during the pandemic, as the demand for them increased. One participant said:

“To get medication at times, like vitamin tablets, vitamin C, you can’t get it.”
[P15]

“I tried to go to a pharmacy and get a multivitamin, but they were completely sold out. Zinc was completely sold out. That’s how bad it was during that time.”
[P16]

The data reflected that as the pandemic progressed, there were difficulties getting certain types of supplements due to low stock or the medicines being completely sold out. The pandemic caused people to enter a frenzy as the data provided evidence that people all around overused these types of supplements and over-stocked them, leading to low stock.

As evidenced in the literature, the sale of supplements increased significantly by 19.5% in the months leading up to the COVID-19 lockdown in 2020. It was further reported that the use of multivitamins was associated with a reduction in the likelihood of testing positive for COVID-19 (Louca *et al.* 2020). A systematic review reported that during the pandemic, the use of dietary supplements had drastically increased. The reasons offered were to boost immune health; additionally, this was dependent on a few factors, some of which were age, co-morbidities and COVID-19 infection (Arora, White and Mathews 2023).

The data indicated that social media influenced many people in their treatment strategies against COVID-19 by finding important prevention strategies and different types of holistic therapies. Participants said:

“YouTube ... social media, you get these doctors that don’t cost anything to go on and get some advice. So, I use that as well. I use social media platforms to find home remedies and juices and diets and exercise plans all of that. But thankfully, the internet it’s not something that you have to pay a consult for. So, some stuff were hoaxes and myths and lies... I mean you know what, you’re desperate and when you want to be better you will take any advice.”
[P16]

“You go onto YouTube and they’ll say you know there’s this pressure point. I did that no doubt, pressure points, I did that kind of a thing. I did google a little bit of information went on YouTube to see what other things I could use that were available, which I did use.” [P13]

The internet and social media were mediums for finding COVID-19 therapies during the pandemic. Participants understood the risks of trusting social media; however, they found many benefits to using it to find information on health topics and treatment strategies. The benefit of using the internet came at a low cost and was also used at the convenience of participants due to easy accessibility. Wajahat (2020) remarked that social media can serve as both a positive and negative tool. The use of social media provided both useful information on health tips and therapies and also elicited panic and fear from misinformation. A scoping review of 29 articles by Ng, Verhoeff and Steen (2023) found that the use of social media regarding CAM during the COVID-19 pandemic was a source of information and knowledge. This was due to social media giving users the ability to share their personal beliefs and experiences about using CAM, which were either negative or positive. In addition, social media was a source of misinformation, as many platforms gave unreliable and often dangerous advice. The present study showed that participants did rely on social media. It can be concluded that social media use during times of health crises such as the COVID-19 pandemic should be used with caution because potentially dangerous misinformation can be shared and utilised by vulnerable groups of people, in particular those with co-morbidities.

4.4.8 Theme 8: Faith and spirituality

The eighth theme that emerged within the data was faith and spirituality. The sub-themes that emerged were:

- Understanding how the lockdown restrictions impeded people's ability to attend religious gatherings;
- The influence of faith and spirituality during periods of hardship;
- Resilience; and
- Lessons learnt from the pandemic that promulgated a new outlook on life.

4.4.8.1 Sub-theme 8.1: Understanding how the lockdown restrictions impeded people's ability to attend religious gatherings

Sub-theme 8.1 reflected how COVID-19 restrictions affected the ability of people to conduct religious gatherings. The lockdown restrictions had major impacts and

prevented people from attending religious gatherings and places of worship. The participants gave their views as follows:

“We couldn’t really practice our faith or religion. Because all of the facilities were closed during COVID and then after COVID you feel that you didn’t really need the building itself, you could do what you needed to do in your home.” [P18]

“We were not able to attend church as we were on lockdown. So, no religious gatherings were allowed. Our church like many other religious organisations started using social media as a platform to continue with services. So, every Sunday morning service was on YouTube or Facebook.” [P25]

The aforementioned excerpts illustrated that COVID-19 did restrict the participants abilities to attend places of worship. However, this caused people to adapt to their new way of life. It is evident that the pandemic has instilled in them that despite not having a physical building to practice their faith, they were able to conduct their worship in the comfort of their homes. Religious organisations began to use social media platforms to livestream their services to reach people in their homes as gatherings were prohibited. Isiko (2022) concurred that the COVID-19 pandemic prevented people from attending religious gatherings to mitigate the risk of spreading the virus among masses of people. Consequently, people had to adapt to a new way of worship. Furthermore, people who were deeply rooted in their faith before the pandemic became more religious during the pandemic. Conversely, those who were not grounded in their beliefs experienced negative effects on their faith during the pandemic. Kgatle (2020) observed from a media content analysis study that places of worship were significantly impacted during the level 5 lockdown in South Africa. Synagogues and mosques were some of the places affected. However, he added that churches were able to use social media platforms to live stream services.

4.4.8.2 Sub-theme 8.2: The influence of faith and spirituality during periods of hardship

Participants reported that their faith and spirituality allowed them to remain strong and stay positive during times of hardship throughout the COVID-19 pandemic. The influence of faith and spirituality played a substantial role in providing motivation. One participant said:

“It’s been the only things that kept me pushing, kept me motivated, that brought me out of all the dark spaces that I was in. It was my driving force... So, even when I had moments [when] I would sink into depression, I would come out of it because of my faith.” [P25]

The pandemic was a known stressor because of the various aspects it manifested itself and its deleterious effects on the mental and physical well-being. However, faith and spirituality were evidently pathways to resilience and positivity that promoted strength when feelings of depression set in. Faith was established as a means of hope, which allowed them to overcome their feelings of helplessness, even though they were in vulnerable circumstances.

The literature indicated that increasing spiritual resilience and faith in people can counter the effects of COVID-19. Because fear and anxiety have a negative effect on the immune system, they make people more vulnerable to infection (Koenig 2020). By remaining positive and resilient, the opposite is true. It can enhance immune function. Therefore, this is especially beneficial for those with chronic conditions (Koenig 2020). A study by González-Sanguino *et al.* (2020) found through an online survey in Spain with 3 480 participants that despite the pandemic causing anxiety, depression and PTSD, it was faith and spirituality that acted as protective factors against these symptoms.

During periods of difficulty, a participant revealed how religious music helped him. He said:

“After I came out of hospital, I just started listening to a lot of religious songs and it kept me strong. So, if it wasn’t for that I should be in a worse situation.” [P20]

The above excerpt revealed that the participant found religious music to be a form of strength. The music provided a form of motivation that allowed for self-improvement and healing. Even though the patient was hospitalised for being severely ill, music was seen as a protective factor against poor well-being. In a cross-sectional study using an online survey with 46 participants in the Philippines, Aja *et al.* (2021) reported that during the COVID-19 pandemic, respondents had become inspired through listening to Christian music. Furthermore, it was noted that a song of hope can help people deal with stress and psychological trauma. Situmorang (2021) observed through a review of the literature that music can provide a source of happiness to people through the release of dopamine. Furthermore, they added that by listening to music, patients who have COVID-19 can improve their immunity and improve their physical well-being.

Prayer was another aspect that allowed people to remain positive through the most difficult times. One participant said:

“But I think you must be positive about it and I think prayer helps a lot. You do feel like you’re going to die, you have these feelings. So I think prayer and trying to be positive and don’t let it get you down.” [P09]

A participant narrated how prayer was the source of her strength. While she was sick with COVID-19, she did not find relief from medicine. But her faith and prayer helped her as follows:

“To me, the medication didn’t work. Because it was a three-day antibiotic and I was sick for sixteen days... I’m Christian and I believe that God is the strongest in whatever aspect it is and the highest. So, I just believed in that and I made sure that every morning I prayed, every time I took a medication I prayed. I prayed for the food to help my body and help me during these times... and I never lost faith.” [P16]

Other participants also found strength in prayer, as follows:

“Because now at that time you want to survive through it and that’s the time you want to pray. But before that you never prayed, you didn’t give a worry for that guy, you never pray for that person who had COVID, who went through something. You didn’t worry about it. Only when it happens to you then.” [P12]

“Everyone has their own beliefs; I believe that there is a God and spending time in prayer was something that definitely calmed me down and grounded me in truth that this was just a passing phase.” [P26]

As evidenced in the data, participants relied on their faith and spirituality throughout the pandemic through prayer. Prayer was viewed as a form of security, as participants did not trust the treatment protocol in place for their COVID-19 symptoms because they concluded that it was ineffective. Thus, their faith became a source of strength, which allowed them to become fearless and resilient in the face of danger. The pandemic, then, can be seen as both a stressor and a medium of enlightenment. The stress induced by the pandemic had the to cause fear and panic, but a contrasting view suggests that the pandemic also allowed individuals to become reliant on their spiritual lives, leading to find a newfound commitment to their faith. The act of prayer also allowed individuals to have hope that, through all the difficulties of the pandemic, they understood that it was only temporary.

Roberto *et al.* (2020) noted that faith and spirituality enabled people to overcome the various stressors related to the pandemic, in particular their fear and anxiety. Furthermore, they noted that prayer can help people achieve optimism and hope, which can improve psychological health. Wiederhold (2020) reported that at the start of the pandemic, Americans began to perform online searches for prayer, which grew sizeably. Further, they noted that the COVID-19 pandemic deepened people’s religious faith. Additionally, while this predominantly occurred in those who were already religious, there was an increase in prayer in those who seldom prayed. Coppola *et al.* (2021), who conducted an online survey in Italy with 1 250 participants, observed that during the lockdown, those individuals who were religious and spiritual attained a form of inspiration to remain unmoved by their negative circumstances.

4.4.8.3 Sub-theme 8.3: Resilience

Sub-theme 8.4 explored the resilience of people during the COVID-19 pandemic. This sub-theme was shared equally among both samples, namely, infected and affected. Participants reported on being positive during the pandemic and how this positivity enabled them to overcome a wide range of challenges, despite the various dangers that the virus caused. They said:

“I can say we pulled through it; it was fine... I take it as a positive outcome that I had to go through to open my eyes in a way.” [P12]

“I didn’t have any worries. I took everything as it comes. The more you worry, the stress starts building inside you. You see them [wife and daughter who had COVID-19] in the bed. You see them lying down, you just want to tear. No, I took everything as normal, I should talk to them, laugh, but after that it [COVID-19] never affected me a bit even up to this very day.” [P03]

Participants shared how they overcame their difficulties, by moving forward:

“It was getting to us because we couldn’t cook, we couldn’t even sleep sometimes, and we couldn’t even breathe properly... At that moment it was bad, but we overcame it.” [P11]

“My daily functioning goes on as a father and as a provider because you have to keep going forward because of the children, so can’t really set me back too much. The caution and the fear, which will never go.” [P07]

The excerpts above describe the resilience of people during the pandemic, despite the tumultuous effects of the pandemic. Participants were fully aware of the circumstances they were in but chose to remain hopeful. The COVID-19 pandemic was viewed through a lens of positivity with a different perspective, which is seen as a positive outcome rather than a bad or negative one. It is evident that even with all the hardships and negativity, there was a need to persevere and maintain their livelihood for their families. The

excerpts evidenced that remaining positive or hopeful ensured resilience and can be seen as beneficial to the mental and physical well-being of the participants. Resilience was expressed by both samples in this study. The reason for this could be that the pandemic was fraught with negative connotations, whether people were infected or not. The literature reflected that remaining hopeful during the pandemic offered protection of the mind during times of distress (Counted *et al.* 2022). Chen (2020) argued that the COVID-19 pandemic caused a multitude of problems, like social isolation, fears, stress and anxiety, which were hard on senior groups and those with co-morbidities. Furthermore, the author added that resilience allows people to deal with stressful situations, is viewed as a protective mechanism against distress and helps against the harmful effects of psychological distress. Chiesi *et al.* (2022) assessed the traits of resilience in 409 Italian female cancer patients and survivors, namely optimism and hope, and found that these positive traits in the patients increased their resilience, which in turn reduced their level of psychological distress.

4.4.8.4 Sub-theme 8.4: Lessons learned from the pandemic that promulgated a new outlook on life

Sub-theme 8.4 explored the lessons that the participants had learned throughout the pandemic and how it gave them a new outlook on life. Participants reported having a new outlook after being infected by the virus and surviving it, as reflected in the excerpts below. A participant shared on how they became more grateful and appreciative:

“I think COVID has made me as an individual to be, you know, humble and not to take anything for granted. Just to appreciate everything we have and just live your life to the best you know because COVID has really snatched a lot from every one of us in this world.” [P13]

The COVID-19 pandemic allowed people to embody a change in character and pursue a life of change. One participant narrated that their entire outlook changed, and they began to become both grateful and giving. He remembered the support he received from his family and reciprocated this by bringing happiness to his loved ones:

“Focussing more on myself and my family to prosper in everything. I’m trying to give my family the happiness and to make up for all the times that I’ve hurt them, but I put my parents through a lot prior to having COVID and stuff. When I was sick it’s like they looked past whatever, I did to them and they accepted me as their child you know and they took care of me. So, I just wanna make everyday a happy moment for all of us. So, it really changed me and people around me can also see that I’m not the same person that I was before. It changed my whole routine of living.” [P12]

Other participants also embodied a positive outlook, as follows:

“Waking up every day and trying to maintain a positive mindset as well and just trying to steer clear of everything that’s negative.” [P26]

“It was a bittersweet because obviously this journey to recovery meant losing a lot of people, but it also helped me find myself and it helped me be so much ... stronger... moving forward, I know I have overcome.” [P25]

The preceding excerpts revealed that the participants established a new outlook on life. While COVID-19 and its related consequences are viewed through a negative lens, some people see the brighter side of it. COVID-19 taught people valuable lessons. As such, they became more humble and grateful. Further, they learned not to take anything for granted and to become appreciative of their surroundings. The pandemic caused individuals to have a newfound respect for themselves and their families by learning to focus on their own well-being and that of their families. Therefore, despite the pandemic disrupting the lives of many, a silver lining was evident, as people became more positive and experienced feelings of gratitude.

COVID-19 caused people to re-think their stance on life and look at the positive rather than the negative to ensure their well-being. Participants attained a sense of added strength by knowing that they had overcome the difficulties of the pandemic. This was seen particularly among those who had been infected by SARS-CoV-2. It is assumed

that the intensity of the infection and their ability to survive changed the perceptions and mindsets of people to be more appreciative.

The literature identified similar sentiments, as Kowalski, Carroll and Britt (2022) remarked that sometimes people can discover a silver lining in stressful situations. This is known as post-traumatic growth (PTG). This is defined as a change in how one perceives oneself, family and others through the lens of positivity, especially after a negative situation and the attainment of gratitude. Their study found that by finding positivity in a situation, people achieved higher post-traumatic growth, gratitude and better mental well-being. Jenkins *et al.* (2021) further alluded to the fact that people found a silver lining despite experiencing socio-economic decline and were grateful when they retained their jobs. This was significant as unemployment can elicit emotional distress, and by being grateful, they remained optimistic despite the other negative effects of the pandemic. Further, they noted that the pandemic allowed people to reflect and achieve personal growth. A study by Vos *et al.* (2021) that was conducted through an online survey with 546 participants across the Netherlands and Belgium found that being optimistic can negate the negative mental effects that were created by the pandemic, such as depression and anxiety.

CHAPTER 5: SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The purpose of this study was to understand how the COVID-19 pandemic affected the physical and psychosocial well-being of people living with a co-morbidity or co-morbidities. The study used a qualitative research approach with the application of an exploratory-descriptive research design to identify the challenges of a vulnerable group of people, namely those with co-morbidities, during the pandemic. This chapter provides the major findings, conclusions, limitations of the study, recommendations for improving holistic well-being, recommendations for further research and the significance and contribution of the study.

5.2 Major findings from the study

The study yielded evidence crucial to understanding the plight of people with co-morbidities who are vulnerable to the effects of COVID-19. The data reflected the challenges and difficulties that people with co-morbidities faced during the COVID-19 pandemic and how they overcame their circumstances.

The first objective of the study was to enquire how COVID-19 affected the physical health of persons with co-morbidities. The data from this study showed that COVID-19 had deleterious effects on their physical health and well-being. The data additionally demonstrated that individuals in Sample 2, who had contracted COVID-19 experienced major complications related to their physical well-being as compared to those in Sample 1, who were affected by the circumstances surrounding the pandemic. These implications centred around heightened COVID-19 symptomatology and long-COVID symptoms. There was a heightened effect of COVID-19 symptomatology in people with co-morbidities. These heightened symptoms were largely attributed to the interplay of SARS-CoV-2 and the presence of a co-morbidity. Ultimately, this resulted in diminished coping mechanisms within this vulnerable group of patients that led to patients being hospitalised with some being admitted to the ICU.

A major finding involved the identification of long-COVID symptoms among the participants of this study. These symptoms posed an obstacle that affected the recovery and overall well-being of the patients with co-morbidities. Patients experienced fatigue,

tiredness, memory loss, decreased concentration, body aches, syncope, effects on the respiratory system, hair thinning, loss of taste and smell and sleep disturbances. Additionally, a decreased immune function was mentioned during the interviews as participants felt that they became sick more often after COVID-19, leading to the notion that the virus had impeded their immune system's ability to function effectively. Thus, having a co-morbidity is speculated to influence the heightened long-COVID symptoms. The data revealed empirical evidence of how patients developed new chronic conditions after being infected by SARS-CoV-2, namely hypertension and sleep apnoea. They also emphasised how COVID-19 worsened their co-morbidities.

The data evidenced that the lockdown and COVID-19 restrictions had affected the patients' lifestyles. Physical activity had dwindled during the lockdown due to limited movement, which caused a decline in physical activity. This was a concern among patients because it was believed to have negative effects on their physical health and co-morbidities. However, the lockdown also provided people with an opportunity to exercise within their homes, which is largely beneficial. The lockdown had positively led to changes in participants' diets, which was another benefit to their health and well-being.

The second objective was to understand how COVID-19 affected the mental health of those infected and affected by a co-morbidity. Both groups of participants experienced mental health effects. One of the major causes was the economic stress caused by the pandemic. The patients also experienced PTS because of their experience with COVID-19, resulting in severe anxiety. A key finding indicates that those who became severely ill from COVID-19 experienced higher states of PTS, which could be due to the intense mental trauma they had experienced during their infection by the virus.

The data revealed heightened fears and anxiety among all participants in this study. However, the fears and anxiety were heightened amongst those previously infected by SARS-CoV-2. The fears specifically centred around death, the risk of infection, seeking medical care and the future. The patients also had an immense sense of anxiety over their own health and that of their family members. Further, the use of social media was seen as one of the contributing factors to the fears and anxiety. They also experienced anxiety, depression and stress as a consequence of the isolation and periods of quarantine. The heightened emotions experienced during the COVID-19 pandemic caused patients to experience worsening of their chronic conditions. The data

additionally provides empirical evidence that depression could lead to an increased susceptibility to SARS-CoV-2.

The third objective explored how the family and social lives of people with co-morbidities were affected by the virus. Many experienced an increase in family bonding during the COVID-19 pandemic, which was largely due to the increased amount of free time people had. The use of technology like cell phones aided people in enhancing communication over long distances, which further improved family bonding. In contrast, other participants experienced conflicts among family members. These conflicts centred around finances, implementing hygiene measures and being confined to the home with other members of the family. The data also revealed that conflicts within the family led to misunderstandings and broken relationships. This further negatively influenced their mental well-being. Family and friends were seen as sources of strength that buffered the negative effects of the COVID-19 pandemic and helped maintain positive mental well-being. In terms of social lives, people with co-morbidities developed a new way of life and began to limit social visits, thereby adopting new social standards. These adaptations stemmed from their fears of infection and their perceived vulnerabilities to SARS-CoV-2. Bereavement was also affected during the pandemic, which could have long-term psychological implications for people with co-morbidities.

The fourth objective was to understand how those infected and affected received healthcare within the context of the pandemic. Both samples were negatively affected by the COVID-19 pandemic. The waiting times at the medical facilities were generally longer due to the added strain on these facilities as there were more patients to attend to. This was further compounded by staff constraints and the availability of beds and wards. COVID-19 negatively impacted the collection of chronic medication, as patients were sometimes sent to other healthcare facilities to collect medication and at other times the facilities were closed. The medication was not always available, leading to patients purchasing it privately or borrowing it from others. In terms of the COVID-19 vaccine, the patients were generally accepting of it and viewed it as a positive tool to fight the SARS-CoV-2 infection; however, some viewed it as ineffective.

The fifth objective was to explore the alternative and holistic therapies used by both infected and affected persons to ensure their optimal health. Both sample groups used holistic health practices. This was done to ensure prevention of infection from SARS-CoV-2 by maintaining a healthy and strengthened immune system and, after infection,

to treat symptoms of COVID-19. The data revealed that patients employed the use of multivitamins, ginger, garlic, zinc and individual supplements of vitamin D and Vitamin C. There was an increase in the use of home remedies, increased exposure to sunlight and the practice of breathing exercises. The participants started to use other forms of complementary medicine, namely yoga, reiki and ayurveda. The participants revealed that multivitamins had become scarce during the COVID-19 pandemic, which can be attributed to the increased demand for the products. Further, the data reflected that social media had a great influence in helping people find alternative therapies, which were cheaper options than visiting a doctor.

Faith and spirituality were an important focus for some of the participants in the study, who drew inspiration and strength from their faith to persevere through difficult times. The data revealed that participants were able to overcome the psychological stressors of the pandemic through their faith. Additionally, the use of religious music and prayer were important tools that the participants used to remain positive.

5.3 Limitations of the study

The participants of the study were from a single race group, namely Indians, which is reflective of the study site. Participants were recruited from the greater Durban area only; therefore, the results cannot be generalised to all people in South Africa. Future research should include a more diverse population from different areas and provinces of the country.

5.4 Conceptual analysis

The COVID-19 pandemic was a source of significant strain that inundated the lives of people with co-morbidities in South Africa (Kushitor *et al.* 2020). This study served as a foundational building block to elucidate and highlight both the unique challenges experienced by this group of patients and their moments of human resilience. This section therefore provides insight into the lives of people with co-morbidities. The biopsychosocial model was a salient guiding framework, upon which the study was predicated. It created a lens to understand more deeply how the bio-psycho-social and spiritual facets are intertwined with each other and added support for the emerging themes from the data. This was demonstrable throughout the study and helped create

an understanding of various influences, both positive and negative during the COVID-19 pandemic.

The themes derived were based on participants experiences, which collectively had many common features. They were unified in terms of the biopsychosocial model: bio (physical well-being), psycho (mental well-being), and social (economic, social, community, family, healthcare and spiritual) (Engel 1977). Each theme was interconnected and provided a glimpse into how people with co-morbidities experienced the COVID-19 pandemic as a patient with a co-morbidity.

The study found that COVID-19 significantly worsened the co-morbidities among the sample and caused heightened COVID-19 symptoms and also in some cases long-COVID symptoms. These findings resonate with other studies in the literature (Adepoju 2020; Dryden *et al.* 2022a). However, the study revealed a connection between the participants' physical well-being and their mental health. Participants also reported that their psychological distress also birthed various physical manifestations and worsened existing co-morbidities like hypertension and diabetes. Therefore, it can be interpreted that people with co-morbidities are not only at risk of physical manifestations from the virus but are also at risk of compounding physical health conditions through mental distress. This finding was also apparent in other studies (Zidkova *et al.* 2021). The implication related in the physical sphere is that people with co-morbidities are innately vulnerable to heightened symptomatology and prolonged convalescence. People with co-morbidities are not uniquely vulnerable to intense fears around infection and death, but their increased susceptibility heightened these vulnerabilities in the mental sphere. There were also two risk factors: economic decline and an unstable healthcare system. This is important to consider, as future pandemics might have similar effects on this group of people. Mentally, people with co-morbidities had heightened fears around their susceptibility to the virus, which emanated from the rapid spread of information through social media. However, this fear was justifiable as people with co-morbidities were at greater risk of mortality from SARS-CoV-2 (Schlüter *et al.* 2021). According to this study, the two biggest issues related to COVID-19 were uncertainty and death. These fears formed the basis for other fears, namely fear of the future, the risk of infection and securing appropriate, timely medical care. Moreover, isolation during the lockdown caused feelings of anxiety, depression and loneliness. An ameliorative element to this, within the context of the study's findings centred around family and friends. The bonding

and close-knit relationships with loved ones caused a sense of comfort and promulgated positive emotions (Martínez-Líbano 2023), which offset the huge levels of distress experienced by this vulnerable group of patients. Therefore, it can be argued that having a dependable support structure, during a pandemic provides support and serves as means of coping. This was further strengthened by the unity of the community, which provided a sense of support during this challenging period. A salient finding was that despite economic disruptions that led to many feeling a sense of desperation, the community was pivotal in alleviating those burdens by provisioning those with basic needs and support. Jewett *et al.* (2021) noted that social cohesion in the community can have positive effects on well-being.

People with co-morbidities were dependent on the healthcare system to provide medication and treatment. However, the study found that there were a multitude of flaws in the system, which led many to feel vulnerable and dissatisfied. Thus, it can be postulated that COVID-19 had burdened and overwhelmed an already fragile healthcare system. This consequently affected this vulnerable group with co-morbidities even more due to limited supply of medicines. Participants had to resort to borrowing medicine, standing in long queues for some which placed them at greater risk and to endure a lack of healthcare staff, who could support them. People with chronic illnesses are dependent on public healthcare for collecting their medication (Stachteas *et al.* 2022). Therefore, the implications of inadequate staffing and inadequate medicine had dire consequences on their lives. This was evidenced by the current study, which revealed the dissatisfaction patients voiced with the delivery at healthcare facilities. These are important considerations that the healthcare system needs to be cognisant of in the event of future pandemics. One other positive finding was that participants used complementary and alternative therapies to ensure their well-being.

COVID-19 amongst those infected and affected patients with co-morbidities, has huge ramifications for the long-term psychological health of this group. Their vulnerabilities were evident in this study and provided a glimpse of how the pandemic affected every sphere of their lives, namely, the physical, mental, social and spiritual.

This study has demonstrated that the COVID-19 pandemic was a period of intense struggle in the three areas of the biopsychosocial model. Common trends of deleterious effects emerged on the physical, mental and social levels. However, a conceptual finding was that through all the difficulties, participants portrayed two coping mechanisms,

adaptation and *changed perspective*. In every theme of the study there were moments of acceptance, newfound hope, resilience and a change in perspective. Through the various challenges that were encountered, people with co-morbidities adapted to their new realities through various means. Some exercised indoors, changed dietary lifestyles, bonded with family, performed activities to keep busy, supported each other, found unity and help from the community and religious organizations, cared for loved ones, re-defined their social norms, found solace in isolation, adopted holistic therapeutic practices, drew strength from prayer, and altered their perspectives with a new outlook on life. This was certainly true of the spiritual aspect of the human being. The addition on the spiritual component to the biopsychosocial model further displayed how faith and prayer fostered a positive well-being in people with co-morbidities (Sulmasy 2002).

Many participants noted a change in perception, viewing the pandemic as a process of learning that altered their perspective on life. Therefore, it can be perceived that in future pandemics, people with co-morbidities may experience initial difficulties, but they have the ability to adapt to external stressors. Similarly, Fisher *et al.* (2021) conducted a study in the UK with 32 participants. The authors found that during the COVID-19 pandemic, people with chronic diseases who experienced psychological distress and accepted their circumstances overcame the negative effects of uncertainty on their well-being.

Furthermore, the various influences found in this study served as buffers counterbalancing the negative effects of poorer well-being with positive ones. Two distinct mechanisms related to well-being were deduced based on the themes namely: (1) components causing negative well-being (heightened challenges) and (2) components causing positive well-being (adaptation and change in perception). The second set of components also served as buffers for positive well-being. Table 5.1 shows the various elements that can either promote negative or positive well-being. These elements are important in understanding the mechanisms people with co-morbidities experience that leads to their general well-being.

Table 5.1: Tabulation of components promoting negative and positive well-being

Components promoting negative well-being (Heightened challenges)	Components promoting positive well-being (Adaptation and change in perception)
• Intense symptomatology arising from COVID-19 • Long-COVID symptoms • Somatisation and resultant deteriorative physical health. • Psychological distress • Anxiety, depression and fear • Loneliness • Helplessness • Transport difficulties • Declining livelihoods • Unemployment, decreased working hours and wage reduction • Social disconnection • Breaking COVID-19 protocols • Family conflicts • Bereavement • Poor healthcare • Lockdown impeding worship	• Alteration of lifestyles in terms of diet and maintaining indoor exercise • Change in social behaviour • Unity within the community • Humanitarian and the philanthropic role of the community and religious organisations • Family bonding • Family and friends as a support structure • Application of holistic therapeutic practices • Prayer and faith • Resilience • New outlook on life

Although the pandemic was fraught with a vast number of difficult situations that created both physical and mental challenges, a multitude of buffers contributed to positive well-being. people with co-morbidities must be viewed through a holistic lens. Hence a comprehensive multifaceted approach must be leveraged to assist them cope with the biopsychosocial facets of their co-morbidity and COVID-19 even when future pandemics emerge. The issues that spawned were not isolated but transcended through all aspects of human life, making it pivotal that a holistic approach to care be offered to this vulnerable group of patients.

5.5 Recommendations for improving holistic well-being

The sixth objective of this study was to make recommendations for improving the holistic well-being of individuals who have recovered and those affected, particularly persons with co-morbidities. The recommendations, below, were formulated based on the research findings and the researcher's deduction, which showed the depth of heightened challenges that people with co-morbidities experienced during the COVID-19 pandemic. The recommendations can also be adapted for future health crises. There are two categories of recommendations namely, recommendations derived from the study and recommendations deduced by the researcher as well as the literature.

5.5.1 Lifestyle changes

The data from this study and the literature reviewed have reflected the effect that COVID-19 had on people with co-morbidities. During the pandemic, people were subjected to limited movement, isolation, quarantines, unhealthy diets, increased online activity, increased hours spent watching television, restrictions on exercise and weight gain. These unhealthy patterns have been detrimental to the lives of this vulnerable group of people, which has led to heightened problems in both their physical and mental well-being. Therefore, patients with co-morbidities need to prioritise their physical well-being during periods of national and international crises by promoting positive lifestyle changes. The literature suggests that healthy diets and exercise can reduce inflammation in the body, which is essential for improving co-morbidities. Furthermore, healthy diets and exercise are essential to promoting physical well-being. The infection by SARS-CoV-2 caused long-COVID complications in many of the patients. These extremes have disrupted their daily functioning. The following recommendations relate to ensuring good physical health.

Exercise

The recommendations below emerged from the data and literature related to how exercise can optimise physical well-being:

- Participants found breathing exercises useful during their period of infection. Breathing exercises should be employed to improve respiratory function, especially for those with long-COVID complications of dyspnoea.
- Increase exercise to maintain an optimal weight and reduce complications related to cardiovascular health and hormonal diseases. These exercises must be specifically designed for individuals to ensure that they do not over-exert themselves (Chesnut, MacDonald and Wambier 2021).
- Healthcare facilities should assist patients in determining exercise routines and schedules to help them improve their physical well-being.
- Exercise regimens could be employed to improve some of the long-COVID symptoms, namely fatigue, pain, immune function and sleep disturbances (Colas *et al.* 2023).

Healthy diets

Healthy diets are essential for maintaining good health. The following recommendations can be incorporated into patients' daily lives and were derived based the literature and data of this study:

- Patients found that healthier eating was a product of the COVID-19 pandemic. This could be promoted among patients at healthcare facilities to ensure that patients with co-morbidities maintain their well-being. Healthcare facilities could implement strategies to assist patients in creating meal plans and dietary schedules that are affordable and easy to follow.
- Dietary changes can be implemented to improve overall physical health and well-being. These can include more fruit and vegetables, portion control and balanced diets. Anti-inflammatory diets can be useful for patients with co-morbidities (Zhao *et al.* 2023).
- Promoting dietary changes within the family setting can establish a structured support system, enabling patients to maintain healthier eating habits (Czarniecka-Skubina, Gutkowska and Hamulka 2023).

- The study also showed that lifestyle diseases like diabetes, hypertension and hypercholesterolaemia were significantly prevalent among the patients; therefore, specific dietary regimens tailored for those conditions should be utilised.
- Healthier eating can also be associated with improved immune function, as evidenced in the literature from this study. Therefore, it is essential to promote healthier eating in disease prevention and care (Zhao *et al.* 2023).

Other recommendations to promote physical health

- Fall-related injuries need to be adequately addressed through the provision of physiotherapy for the affected patients. Patients additionally need to become aware that, when infected with COVID-19 or any other potential viruses in the future, fall-related injuries can occur. Therefore, there is a need to implement safety precautions in the home by not taking showers and not walking around when alone. Patients should also monitor their blood pressure and the use of antihypertensive drugs.
- Patients with co-morbidities need regular screening by healthcare providers through wellness programmes to assess the extent of the impact of COVID-19.
- Patients need to establish better monitoring of their conditions by using home testing devices through journals and detailed recording of symptoms and readings and reporting their findings to health providers to assess.
- In the event of new-onset co-morbidities, patients should monitor their conditions to assess how the disease is progressing and determine if the new conditions are short- or long-term.

5.5.2 Improving mental health and well-being

Considering the literature examined and the data from this study, it is important to establish mechanisms to counteract the deleterious consequences of COVID-19 on the mind. This is especially important for patients with co-morbidities, as they are vulnerable to the effects of stressful situations. Implementing these recommendations can improve the mental health of patients.

Management of mental health and well-being

Stress management is essential to helping patients with co-morbidities improve their mental health. The recommendations are outlined below and are derived from the study findings and the literature:

- From the study findings, it was evident that promoting positive thoughts and being resilient through times of crisis can be beneficial and reduce psychological distress.
- The data also revealed that faith and spirituality were cornerstones for many patients, as they improved their sense of security and mental stability. Therefore, faith and spirituality can be used to provide mental well-being during periods of heightened stress. This can be done through listening to religious music, praying and attending virtual services.
- The isolation during the COVID-19 pandemic caused patients to experience depression and loneliness. The restrictions affected the ability of patients to socialise. Therefore, other forms of connectivity should be utilised. People should use social media and technology to connect with people, as the study found that people who connected through these means found a sense of strength and mental well-being. These patients should also adopt hobbies and activities to alleviate the consequences of social isolation.
- Participants noted memory loss and a lack of concentration. This can be improved by writing important information down.
- Fears around infection and death were evident from the data, and as such, patients can adopt increased sanitary protocols through sanitising, avoiding visitors as well as social visits.
- Support groups are necessary (Margherita *et al.* 2022), especially for patients who are particularly vulnerable to the mental health effects inflicted by the COVID-19 pandemic. These support groups should be initiated by healthcare facilities which could appoint a healthcare professional on specific days to assist those patients who require support. Furthermore, the therapeutic effects of the support groups can aid those seeking closure in relation to bereavement. In addition, these groups can help people overcome PTS and depression.
- Support can also be implemented by healthcare facilities through one-on-one counselling, which can further benefit patients in times of crisis.

- Public healthcare facilities should implement strategies to educate patients on the misconceptions around COVID-19. This could help abate any fears about the virus.
- Patients should utilise internet platforms and social media services to learn about COVID-19 to alleviate their fears; however, extreme caution must be used to avoid misinformation. To avoid this, patients can consult with healthcare professionals at their respective clinics and hospitals (Schmidt *et al.* 2020).
- The economy was a stressor; therefore, as the literature suggested, being financially stable through savings and financial literacy can alleviate the burden of economic hardships (Netemeyer *et al.* 2017).
- Anxiety was an enabler that exacerbated participants chronic conditions. Therefore, patients should practice anxiety-relieving exercises like mindfulness (Vos *et al.* 2021).

Family and friends as a support structure

Family and friends were viewed as a source of strength among participants in this study. This assisted them in improving their mental well-being. The following recommendations relate to improving bonds among family and friends to ensure improved psychological well-being. These recommendations were based on the study findings and literature:

- The study showed that family bonding was an intricate aspect of family strength as it empowered participants to remain mentally strong during heightened periods of stress. Therefore, families should engage in activities that enhance family bonds and relationships. These can be in the form of exercising together, watching television as a family, cooking together and helping with chores and responsibilities around the home. Leisurely activities can provide a form of distraction from the negativity happening around them.
- Family caregiving was important during the pandemic as patients cared for one another during the SARS-CoV-2 infection; however, it also caused a major strain among patients. This can be improved by rotating responsibilities within the home. The rotation of duties and chores can be written down on charts which designates certain tasks to specific individuals.

- People with co-morbidities are vulnerable to infections; therefore, they should ask friends or family to run their errands, for example, the purchase of medication and other essentials.
- Conflict resolution is essentially important in the family setting to ensure the well-being of the family and mental well-being. Therefore, improving communication and sharing concerns can prevent disagreements and conflicts (October *et al.* 2021).

5.5.3 Healthcare

Patient satisfaction is dependent on many factors, as demonstrated in the reviewed literature (Kagura *et al.* 2023). These factors include waiting times at medical facilities, retrieval of chronic medication, as well as patient and staff interaction. Hence, the adoption of the following recommendations is essential to address current issues, particularly during intensified crises, such as the COVID-19 pandemic.

Waiting times

The following recommendations were derived from the study findings and literature:

- The data revealed that patients wait in different streams during their visits to the clinic. The COVID-19 pandemic caused delays in wait times as COVID-19 patients were prioritised. In times of crises, it is advisable for individuals with co-morbidities to retrieve their medications from tents positioned outside clinic facilities. This option is particularly beneficial for patients solely seeking medication without the need to visit their doctor or nurse. This intervention can also limit the spread of infection and decrease waiting times.
- Patients should also try to adhere to their appointment schedule to prevent healthcare facilities from becoming inundated.
- The data revealed that doctors were not as 'hands-on' during the pandemic. Therefore, medical staff need to adopt a more patient-centred approach and learn to understand the fears and needs that patients have.
- During the closure of healthcare facilities, patients often missed their appointments. It is recommended that patients communicate effectively through

phone calls or SMSs beforehand to avoid unnecessary burdens like transportation costs and unnecessary leave from work.

- During the pandemic, there were major staff constraints. Healthcare facilities should aim to cater for the number of patients they attend.
- The data showed that healthcare facilities did not have stocks of specific medications. This caused patients to seek out and purchase their own medication. The study recommends that medical staff source the medication from other facilities on behalf of the patient to avoid unnecessary financial problems.
- Patients had begun to share medication during the COVID-19 pandemic. Programmes need to be implemented to spread awareness about the dangers of sharing and borrowing medication.
- There were reports of fears about attending healthcare facilities; therefore, online services increased. The study recommends that patients use online medical consultations to seek healthcare if they are apprehensive of face-to-face consultations.
- To deal with the challenge of large crowds at healthcare facilities, the local clinics should employ a home delivery system of medication for patients within the area (Mash *et al.* 2022).
- The data evidenced that patients who understood the healthcare facility's procedures reported higher satisfaction levels. Therefore, it is recommended that facility staff engage in programmes to educate patients about the different protocols and procedures in place (Abrahams, Thani and Kahn 2022).

The use of complementary and alternative medicine (CAM) and traditional medicine (TM) use among patients

There was a significant increase in CAM, TM and supplement use in South Africa, as purported through the literature reviewed and the interviews with patients in this study. The recommendations that follow advocate the use of CAM and TM for patients with co-morbidities.

- Patients can seek out ways to establish a protocol to incorporate holistic practices as an adjunct to their mainstream treatment by consulting with their General practitioners or specialist doctors.

- Holistic wellness programmes can be designed to educate patients with co-morbidities on useful CAM and TM practices. These practices are generally cost-effective and thus should be used to allow patients to benefit from them (Alzahrani *et al.* 2021).
- It is recommended that patients who become infected with SARS-CoV-2 use appropriate medically approved breathing exercises and get plenty of sunlight, as patients in this study found this useful (Asyary and Veruswati 2020).
- Patients should seek to learn more about CAM and TM by using the internet. They can also seek advice from medical personnel; this is necessary to avoid any harmful misconceptions (Wajahat 2020).

5.6 Recommendations for further research

The COVID-19 pandemic has only proven to heighten the burdens of people with co-morbidities. Therefore, there is a need to establish more research in this field to provide support to those in need. The following recommendations aim to extend the boundaries of research beyond this study to further improve knowledge and understanding of patients with co-morbidities and how COVID-19 affected them. This will benefit patients in the future in the event of national and international crises.

- This study was a qualitative study that focussed on in-depth interviews; however, the sample size was small as per the requirements of a qualitative study. While the sample size did not influence the quality of the data obtained, it would be useful to conduct a study using quantitative methods to extend the sample size.
- This study was conducted in South Africa and reflected the experiences of South Africans. The methodologies of this study can be employed in other countries to view their experiences.
- Long-COVID symptoms were a major consequence of the SARS-CoV-2 infection in people with co-morbidities. Further studies should seek to understand and explore the impact of these symptoms in the long term.
- Empirical evidence shows that COVID-19 decreases immune function in people. Therefore, it is imperative that more studies be conducted to ascertain conclusive evidence demonstrating the influence of SARS-CoV-2 on immune function.

- This study has shown empirical data on somatisation in people with co-morbidities. Therefore, this is the start of exploring the concept of somatisation in people with co-morbidities in the South African and international context.
- In some instances, the COVID-19 pandemic led to the emergence of post-traumatic stress (PTS). Studies need to assess the long-term effects of PTS. Especially in the context of South Africa, with the intricacies of economic disparities, mental health and family, as well as social dynamics.
- The philanthropic role of the community and religious organisations needs to be explored further, as they were sources of strength for people during the pandemic.
- The long-term effects of COVID-19 on changes to social norms need to be addressed.
- More studies need to be conducted to address the challenges of healthcare within the context of South Africa and improve patient satisfaction and the effective dispensing of medication to patients. Furthermore, studies should aim to assess protocols in healthcare facilities to properly prioritise patients with co-morbidities during times of crisis.
- CAM and TM should be studied in the context of South Africa to incorporate these practices into mainstream healthcare.

5.7 Significance and contribution of the study

The significance of a study can be defined by its value and the novel contributions, that it makes to the general literature base of knowledge (Muhammad 2024). COVID-19 has subjugated the world in an unprecedented manner. The global impact of COVID-19 are significant, with bans on gatherings, social distancing protocols, and the implementation of severe lockdowns upending the economy and lives of many individuals (Mbunge 2020). This study offers new and valuable insights related to a vulnerable group of patients, namely those with co-morbidities, thereby adding to the armamentarium of knowledge related to those who were infected or otherwise affected by the virus. The information garnered from this research study explored the experiences of those in the eThekweni district of KwaZulu-Natal, in South Africans. It was one the few qualitative inquiries initiated with this vulnerable group of patients.

This study was therefore new and unique to the researcher's best knowledge. The data presented a novel insight into those patients, who were affected by the COVID-19 pandemic and those who were infected by SARS-CoV-2. It was initiated due to the dearth of information on patient well-being, particularly those with co-morbidities. The study illuminated and resonated with other international studies, that COVID-19 had affected patient well-being, including physical health, mental health, created economic challenges, disrupted family life and social life, community well-being, as well as the healthcare system. In addition, the study documented that those patients who became infected with SARS-CoV-2 experienced significantly heightened problems, which then permeated all spheres of their lives.

The literature also similarly emphasised the impact of COVID-19 on people with co-morbidities and how it altered their physical health, mental health and healthcare (Komiya and Hasegawa 2021; Schlüter *et al.* 2021; Zaenab *et al.* 2021; Bik-Multanowska *et al.* 2022). Hence through the voices of this vulnerable group of people, there is now a meaningful expansion of current knowledge related to those with co-morbidities. The study contributed to the trove of empirical information that can be useful to address the challenges that were highlighted from the perspectives of patients during the pandemic in the future.

People with co-morbidities were vulnerable to the effects of the COVID-19 pandemic (Zádori *et al.* 2020). This study has contributed findings that reflected that patients needed a more holistic approach, to ensuring their well-being on the various levels discussed. The role of the patient in determining healthcare policies and frameworks is an important and somewhat vague area. Research suggests that attaining patients' experiences of healthcare is essential, as it takes into consideration the needs of patients and their suggestions for providing effective and good healthcare (Castro *et al.* 2016; Stamm *et al.* 2021). Therefore, this study has the potential to transform the health sector in relation to the challenges identified. Additionally, these recommendations can be assessed and used by the Department of Health of South Africa to further promote patient-centred healthcare. The recommendations made in this study can assist patients in ensuring that they prioritise their well-being in times of distress. By prioritising patients' health and well-being and addressing their concerns, their burdens can be alleviated in the event of future challenges.

5.8 Summary of the chapter

This chapter functioned as the culmination of the research investigation, highlighting important findings, conclusions and recommendations. More specifically, it encompassed an introduction, major findings from the study, conclusions and interpretations of the findings, limitations of the study, recommendations for improving holistic well-being, recommendations for further research, and an overview of the significance and contribution of the study.

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APPENDICES

Appendix A1a: Letter of information in English – Participants affected



Letter of information: Participants affected

Title of the Research Study: Living with co-morbidities during the COVID-19 pandemic: a qualitative study of the heightened physical and psychosocial challenges emerging from the virus.

Principal Investigator/s/researcher: Sunil Neerpath (MTech: Homoeopathy)

Co-Investigator/s/supervisor/s: Supervisor: Professor Raisayah Bhagwan (PhD: Community Health Studies)

Co-supervisor: Professor Firoza Haffeejee (PhD: Health Science)

Brief Introduction and Purpose of the Study: The COVID-19 pandemic began in December 2019 in the city of Wuhan, China and has spread rapidly throughout the world causing widespread catastrophe on a global scale. COVID-19 has caused disruption among people especially affecting the physical and mental health as well as their livelihoods. There is evidence in research that shows how COVID-19 has affected people with co-morbidities in terms of physical health. Co-morbidities are the presence of two or more medical conditions that are present in an individual at any given time e.g. Hypertension and Diabetes. Little research has been done to explore the effect on the mental and physical well-being of patients and psychosocial challenges these people with co-morbidities face. The purpose of this research study is to understand from the individual's point of view, what effect COVID-19 had on their, physical health and psychosocial well-being. The other aspect of this study will be to explore how people received medical care during the pandemic as well as what alternate treatments people used.

Greeting: Good day. I am a student at the Durban University of Technology and I am conducting research for my PhD. I would like to invite you to participate in my research.

What is Research: Research is a systematic search or enquiry for generalised new knowledge.

Outline of the Procedures: The purpose of this research study is to understand from your point of view, what effect COVID-19 had on your physical health and psychosocial well-being. The other aspect of this study will be to explore how you received medical care during the pandemic as well as what alternate treatments people used.

Aim:

To understand how the COVID-19 pandemic affected the physical and psychosocial well-being of people living with a co-morbidity.

Objectives:

7. To enquire how COVID-19 affected the physical health of persons with a comorbidity.
8. To understand how COVID-19 affected the mental health of these infected and affected persons with a co-morbidity.
9. To explore how the family and social life of these persons were affected by the virus.
10. To understand how those infected and affected received healthcare within the context of the pandemic.
11. To explore what alternative and holistic therapies both infected and affected persons used to ensure their optimal health.
12. To make recommendations with regards to improving the holistic well-being of those recovered and affected persons with comorbidities.

Please note the following information regarding eligibility which allows you to participate in the study:

- Patients of the Grove End Public Health Community Clinic
- Patients Affected, but not infected by COVID-19
- All races
- All ethnicities
- English and isiZulu speaking participants
- Patients consenting to the study
- Patients above the age of 18

If you do not meet the above requirement you cannot participate in the study.

The research will consist of an interview schedule that will be given to you to read through before the commencement of the actual interview. Before the interview commences, I will have to obtain the signed consent letter from you which allows me to interview you.

Upon agreement to do the interview, I will arrange a time and location for the interview at your convenience and preference. The interview will be approximately one hour.

The number of participants intended for this study is approximately 16.

Risks or Discomforts to the Participant: There is no physical risk intended towards you. If any psychological trauma or discomfort is brought up during the interview, you will be referred for counselling.

Explain to the participant the reasons he/she maybe withdraw from the Study: You may freely withdraw from the study at any time during the course of the study if you wish to do so. If I feel necessary I will withdraw you from the study.

Benefits: The benefit of this research is that it will enhance the medical knowledge of COVID-19 within South Africa and on an international level.

Remuneration: There is no remuneration for this study.

Costs of the Study: There is no cost intended from you.

Confidentiality: Your identity will remain anonymous to people who intend to read the final research report in the form of a dissertation. You will be referred to as numbers with a pseudonym in the dissertation. The interviews on audio recording will be backed on an external hard drive and

will be password protected. The hard drive and any written notes during the interview will be locked in a cabinet. You may be given access to your own data if you require.

Results: The results of the research will be made available in the form of a dissertation through the Durban University of Technology as well as in the form of journal articles.

Research-related Injury: (What will happen should there be a research-related injury or adverse reaction? Will there be any compensation? A disclosure of any appropriate alternative procedures or courses of treatment, if any, that might be advantageous to the participant)

Storage of all electronic and hard copies including tape recordings: The data from the research which are audio recorded interviews and hand written notes will be stored in a locked cabinet. The audio recorded interviews will be backed up onto an external hard drive and password protected. After a 5-year period all audio recordings will be deleted and hand written notes will be shredded.

Persons to contact in the Event of Any Problems or Queries: Please contact the researcher, Sunil Neerputh on 064 376 1323, my supervisor Raisuah Bhagwan on or the Institutional Research Ethics Administrator on 031 373 2375. Complaints can be reported to the Director: Research and Postgraduate Support Dr L Liganiso on 031 373 2577 or researchdirector@dut.ac.za.

Appendix A1b: Letter of information in English – Participants infected



Letter of information: Participants infected

Title of the Research Study: Living with co-morbidities during the COVID-19 pandemic: a qualitative study of the heightened physical and psychosocial challenges emerging from the virus.

Principal Investigator/s/researcher: Sunil Neerpath (MTech: Homoeopathy)

Co-Investigator/s/supervisor/s: Supervisor: Professor Raisuyah Bhagwan (PhD: Community Health Studies)

Co-supervisor: Professor Firoza Haffejee (PhD: Health Science)

Brief Introduction and Purpose of the Study: The COVID-19 pandemic began in December 2019 in the city of Wuhan, China and has spread rapidly throughout the world causing widespread catastrophe on a global scale. COVID-19 has caused disruption among people especially affecting the physical and mental health as well as their livelihoods. There is evidence in research that shows how COVID-19 has affected people with co-morbidities in terms of physical health. Co-morbidities are the presence of two or more medical conditions that are present in an individual at any given time e.g. Hypertension and Diabetes. Little research has been done to explore the effect on the mental and physical well-being of patients and psychosocial challenges these people with co-morbidities face. The purpose of this research study is to understand from the individual's point of view, what effect COVID-19 had on their, physical health and psychosocial well-being. The other aspect of this study will be to explore how people received medical care during the pandemic as well as what alternate treatments people used.

Greeting: Good day. I am a student at the Durban University of Technology and I am conducting research for my PhD. I would like to invite you to participate in my research.

What is Research: Research is a systematic search or enquiry for generalised new knowledge.

Outline of the Procedures: The purpose of this research study is to understand from your point of view, what effect COVID-19 had on your physical health and psychosocial well-being. The other aspect of this study will be to explore how you received medical care during the pandemic as well as what alternate treatments people used.

Aim:

To understand how the COVID-19 pandemic affected the physical and psychosocial well-being of people living with a co-morbidity.

Objectives:

1. To enquire how COVID-19 affected the physical health of persons with a comorbidity.
2. To understand how COVID-19 affected the mental health of these infected and affected persons with a co-morbidity.
3. To explore how the family and social life of these persons were affected by the virus.
4. To understand how those infected and affected received healthcare within the context of the pandemic.
5. To explore what alternative and holistic therapies both infected and affected persons used to ensure their optimal health.
6. To make recommendations with regards to improving the holistic well-being of those recovered and affected persons with comorbidities.

Please note the following information regarding eligibility which allows you to participate in the study:

- Patients of the Grove End Public Health Community Clinic
- Patients infected by COVID-19 (post three months infection)
- All races
- All ethnicities
- English and isiZulu speaking participants
- Patients consenting to the study
- Patients above the age of 18

If you do not meet the above requirement you cannot participate in the study.

The research will consist of an interview schedule that will be given to you to read through before the commencement of the actual interview. Before the interview commences, I will have to obtain the signed consent letter from you which allows me to interview you.

Upon agreement to do the interview, I will arrange a time and location for the interview at your convenience and preference. The interview will be approximately one hour.

The number of participants intended for this study is approximately 16.

Risks or Discomforts to the Participant: There is no physical risk intended towards you. If any psychological trauma or discomfort is brought up during the interview, you will be referred for counselling.

Explain to the participant the reasons he/she maybe withdraw from the Study: You may freely withdraw from the study at any time during the course of the study if you wish to do so. If I feel necessary I will withdraw you from the study.

Benefits: The benefit of this research is that it will enhance the medical knowledge of COVID-19 within South Africa and on an international level.

Remuneration: There is no remuneration for this study.

Costs of the Study: There is no cost intended from you.

Confidentiality: Your identity will remain anonymous to people who intend to read the final research report in the form of a dissertation. You will be referred to as numbers with a pseudonym in the dissertation. The interviews on audio recording will be backed on an external hard drive and will be password protected. The hard drive and any written notes during the interview will be locked in a cabinet. You may be given access to your own data if you require.

Results: The results of the research will be made available in the form of a dissertation through the Durban University of Technology as well as in the form of journal articles.

Research-related Injury: (What will happen should there be a research-related injury or adverse reaction? Will there be any compensation? A disclosure of any appropriate alternative procedures or courses of treatment, if any, that might be advantageous to the participant)

Storage of all electronic and hard copies including tape recordings: The data from the research which are audio recorded interviews and hand written notes will be stored in a locked cabinet. The audio recorded interviews will be backed up onto an external hard drive and password protected. After a 5-year period all audio recordings will be deleted and hand written notes will be shredded.

Persons to contact in the Event of Any Problems or Queries: Please contact the researcher, Sunil Neerputh on 064 376 1323, my supervisor Raisuah Bhagwan on or the Institutional Research Ethics Administrator on 031 373 2375. Complaints can be reported to the Director: Research and Postgraduate Support Dr L Langaniso on 031 373 2577 or researchdirector@dut.ac.za.

Appendix A2a: Letter of information in isiZulu – Participants affected



Incwadi yolwazi: ababambiqhaza abathintekile

Isihloko socwaningo: Ukuphila namahlalakhona Ngesikhathi sobhubhane ICovid-19: Lolu cwano ngolwazi lwesikhwalithi lugxile kakhulu ekubhekeni izinkinga zomzimba, ezomqondo kanye nezenhlalo ezilethwa ileligciwane.

Umcwani ngi omkhulu: Mnu. Sunil Neerputh (MTech: Homeopathy) **Umdloli**

omkhulu: Usolwazi Raisuyah Bhagwan (PhD:Community Health)**Isekela mdloli:**

Usolwazi Firoza Haffeejee (PhD:Health Sciences)

Isingeniso kaye nenjongo yalolucwano ngolwazi: Lolu bhubhane I Covid-19 laqala ngenyanga kaZibandlela, ezweni lase China kwidolobha lase Wuhan. Lolu bhubhane lusabalale emhlabeni wonke jikelele,ladala umonakalo omkhulu kakhulu,lapho singabala khona izinkinga zokomzimba,ezomqondo kanye nezokuhlala.Kunobufakazi obutholakele ngocwano ngolwazi olwenziwa nge Covid-19 oluveza ukuthi lolu bhubhane luhlukumeze kakhulu abantu abanamahlalakhona,ikakhulu ngokomzimba. Amahlalakhona abalwayo kungaba inhlanguanisela yamahlalakhona amabili nangaphezulu,lapho singabala isifo sikashukela kanye nesokufutha kwegazi nokunye. Luncane ucwano ngolwazi oselenziwe mayelana nokucubungula imithelela yalolu bhubhane kwezomzimba, ezomqondo kanye nezenhlalo kubantu,ikakhulukazi labo abanamahlalakhona. Inhloso yalolu cwano ngolwazi ukuthola kabanzi imizwa noma imibono yabantu ukuthi lolu bhubhane lubakhahlameze kanjani,lapho sibala okomzimba,okomqondo kanye nezokuhlala. Enye ingxenye yalolu cwano ngolwazi ukuthola kabanzi ukuthi imishanguzo kade beyithola kanjani abantu ngesikhathi salolu bhubhane, kanye nezinye izindlela zokulapha leligciwane ebezisiza.

Isibingelelo: Ngiyakubingelela, ngingumfundi wesikhungo sezemfundo ephakeme I Durban University of Technology. Ngenza ucwano ngolwazi kwisigaba seziqhubo zobudokotela(PhD).Ngithanda ukukumema ube yingxenye yalolu cwano ngolwazi.

Luyini ucwaningo?: Ucwanningo ilapho sisuke sijula khona kabanzi ngesimo esithize ukuze sithole ulwazi olusha ngas

Indlela uhlelo oluzohamba ngayo: Inhloso yalolu cwanningo ukuthola kabanzi umuzwa noma umbono wakho mayelana nalolubhubhane ukuthi lukukhahlameze kanjani, lapho sibala okomzimba, okomqondo kanye nezokuhlala. Enye ingxenye yalolu cwanningo ukuthola kabanzi ukuthi imishanguzo kade uyithola kanjani ngesikhathi salolu bhubhane, kanye nezinye izindlela zokulapha leligciwane ebezikusiza.

Injongo: Injongo yalolu cwanningo ukuqonda kabanzi ngezinkinga ezenziwe ilolubhubhane lwe Covid-19, lapho sibala izinkinga zokomzimba, ezokomqondo kanye nezokuhlala kulabo abaphila namahlalakhona.

Inhloso:

1. Ukubuza ukuthi ubhubhane I Covid-19 likhukumeze kanjani ngokomzimba, ngokomqondo kanye nezokuhlala njengoba uphila namahlalakhona.
2. Ukuqonda kabanzi ukuthi ubhubhane lwe Covid19 liwukhahlameza kanjani umqondo kulabo abaphila namahlalakhona.
3. Ukuhlolisisa ukuthi imindeneni kanye nesimo senhlalo kulabo abatheleleke ngaleligciwane bakhahlamezeke kanjani.
4. Ukuqondisisa ukuthi labo abathelekile, kanye nalabo abakhahlamezwe ilolubhubhane, bakuthola ukulashwa ngesikhathi salolubhubhane.
5. Ukuhlolisisa kabanzi ezinye izindlela ezehlukile abantu abazisebenzisile ukuzigcina bephilile.
6. Ukwenza iziphakamiso mayelana nokuphakanyiswa kwezempilo kulabo abakhahlamezwe ilolubhubhane babuye babe namahlalakhona.

Sicela uqaphele uhla olulandelayo ukuze ufaneleke ukuba ingxeke yalolu cwanningo.

- Iziguli zomtholampilo I Grove- end Public health community clinic.
- Iziguli ezikhahlamezwe I Covid-19 kodwa ezingenalo leligciwane.
- Bonke ubuhlanga buvumelekile ukuba ingxenye yalolucwanningo.
- Kumele ukwazi ukukhuluma ulimi lwesingisi noma olimi lwesiZulu.
- Kumele kube ukuthi uyavuma ukuba ingxenye yalolucwanningo.
- Isiguli esineminyaka engaphezulu kweyishumi nesishiyagalombili (18)

Uma uhla lwamagama angaphezulu engakuvumeli, akumele ube ingxenye yalolucwanningo.

Lolucwanningo luzoba nengxoxo phakathi kwakho nomcwanningi, ngaphambi kokuba ingxoxo

iqale umcwaningi uzokunikeza ithuba lokuba ufunde uhla lwemibuzo uzilungiselele. Ngaphambi kokuqala ingxoxo, umcwaningi uzoqale akunikeze incwadi yesivumelwano sokuba ingxenye yalolucwaningo ukuze ubeke uphawu lwesivumelwano. Uma sengithole isivumelwano sakho sokuba ingxenye yocwaningo ngizohlela isikhathi nendawo yengxoxo ngokuvumelana nawe. Ingxoxo izothatha isikhathi esingangehora elilodwa. Lolucwaningo luzodinga abantu abayishumi nesithupha(16)

Ubungozi ngenxa yocwaningo: Abukho ubungozi bomzimba obukhona kulolucwaningo, uma kukhona ukuhlukumezeka kokomqondo, uzokuthola ukwelulekwa ngokomqondo.

Izizathu zokushiya Ucwaningo kothe wazibandakanya: Uvumelekile ukuphuma kucwaningo noma inini ngaphandle kwesijeziso.

Inzuzo: ulwazi oluyotholakala kulolucwaningo emveni kwemibuzo mpendulo luyosiza ekuphuculeni ulwazi nge Covid-19 ezweni lakithi iNingizimu Afrika kanye nomhlaba wonke.

Inkokhelo: Ayikho Inkokhelo etholwa yilowo ozibandakanyayo kulolucwaningo.

Izindleko zalolucwaningo: Akukho zindleko okulindeleke ukuba uzikhokhe kulolucwaningo

Imfihlo: Imininingwane yakho yobunikazi izohlala ifihlekile kunanoma ubani ofunda imiphumela yalolucwaningo. Uzonikezwa inombolo yokufihla ubunikazi, okuyiyo eyovela kwimiphumela yalolucwaningo. Ingxoxo izoqoshwa bese iyavikelwa ngamagama athile okufihla ulwazi azobe aziwa ngumcwaningi yedwa. Amapheshana kanye nakho konke okusetshinzisiwe ukuqopha ingxoxo kuyakuvalwa ekhabetheni eliyimfihlo, kodwa uma ukudinga uyakukhonjiswa kona.

Imiphumela: Imiphumela yalolucwaningo izoshicilelwa kumtapho wolwazi kwisikhungo sezemfundo ephakeme I Durban University of Technology kanye nakwincwadi yokuloba izigigaba.

Ubungozi nokulimala okuqondene nocwaningo: Ngenxa yendlela yalolucwaningo abukho ubungozi obulindelekile nokulimala okulindelekile ngenxa yokuzibandakanya.

Ukugcinwa kwamaphepha kanye nokuqoshiwe: Amapheshana kanye nakho konke okusetshinzisiwe ukuqopha ingxoxo kuyakuvalwa ekhabetheni eliyimfihlo, emva kweminyaka emihlanu konke lokhu kuyaku cekelwa phansi.

Abantu ongaxhumana nabo uma Kukhona ofuna ukukubuza noma uma kubanenkinga: Uyacelwa ukuba uthinte umcwaningi: Sunil Neerputh ku 0643761323, umhloli omkhulu Usolwazi Raisuah Bhagwan ku 0313732197 noma I Institutional Research Ethics administrator

kulenombolo 031 373 2375. Izikhalazo zingabikelwa umqondisi: Research and Postgraduate Support, Dkt L Linganiso on 031 373 2577 or researchdirector@dut.ac.za.

Appendix A2b: Letter of information in isiZulu – Participants infected



Incwadi yolwazi: ababambiqhaza uthelelekile

Isihloko socwaningo: Ukuphila namahlalakhona Ngesikhathi sobhubhane ICovid-19: Lolucwaningo lwesikhwalithi lugxile kakhulu ekubhekeni izinkinga zomzimba, ezomqondo kanye nezenhlalo ezilethwa ileligciwane.

Umcwaningi omkhulu: Mnu. Sunil Neerputh (MTech: Homeopathy) **Umhloli**

omkhulu: Usolwazi Raisuyah Bhagwan (PhD:Community Health)**Isekela mhloli:**

Usolwazi Firoza Haffeejee (PhD:Health Sciences)

Isingeniso kaye nenjongo yalolucwaningo: Lolubhubhane ICovid-19 laqala ngenyanga kaZibandlela, ezweni lase China kwidolobha lase Wuhan. Lolubhubhane lusabalale emhlabeni wonke jikelele, ladala umonakalo omkhulu kakhulu, lapho singabala khona izinkinga zokomzimba, ezomqondo kanye nezokuhlala. Kunobufakazi obutholakele ngocwaningo olwenziwa nge Covid-19 oluveza ukuthi lolubhubhane luhlukumeze kakhulu abantu abanamahlalakhona, ikakhulu ngokomzimba. Amahlalakhona abalwayo kungaba inhlanganisela yamahlalakhona amabili nangaphezulu, lapho singabala isifo sikashukela kanye nesokufutha kwegazi nokunye. Luncane ucwaningo oselenziwe mayelana nokucubungula imithelela yalolu bhubhane kwezomzimba, ezokomqondo kanye nezenhlalo kubantu, ikakhulukazi labo abanamahlalakhona. Inhloso yalolu cwaningo ukuthola kabanzi imizwa noma imibono yabantu ukuthi lolubhubhane lubakhahlameze kanjani, lapho sibala okomzimba, okomqondo kanye nezokuhlala. Enye ingxenye yalolu cwaningo ukuthola kabanzi ukuthi imishanguzo kade beyithola kanjani abantu ngesikhathi salolu bhubhane, kanye nezinye izindlela zokulapha leligciwane ebezisiza.

Isibingelelo: Ngiyakubingelela, ngingumfundi wesikhungo sezemfundo ephakeme IDurban University of Technology. Ngenza ucwaningo kwisigaba seziqubudokotela (PhD). Ngithanda ukukumema ube yingxenye yalolu cwaningo.

Luyini ucwaningo?: Ucwanningo ilapho sisuke sijula khona kabanzi ngesimo esithize ukuze sithole ulwazi olusha ngaso.

Indlela uhlelo oluzohamba ngayo: Inhloso yalolu cwanningo ukuthola kabanzi umuzwa noma umbono wakho mayelana nalolubhubhane ukuthi lukukhahlameze kanjani, lapho sibala okomzimba, okomqondo kanye nezokuhlala. Enye ingxenye yalolu cwanningo ukuthola kabanzi ukuthi imishanguzo kade uyithola kanjani ngesikhathi salolu bhubhane, kanye nezinye izindlela zokulapha leligciwane ebezikusiza.

Injongo: Injongo yalolu cwanningo ukuqonda kabanzi ngezinkinga ezenziwe ilolubhubhane lwe Covid-19, lapho sibala izinkinga zokomzimba, ezokomqondo kanye nezokuhlala kulaboabaphila namahlalakhona.

Inhloso:

1. Ukubuza ukuthi ubhubhane I Covid-19 likuhlukumeze kanjani ngokomzimba, ngokomqondo kanye nezokuhlala njengoba uphila namahlalakhona.
2. Ukuqonda kabanzi ukuthi ubhubhane lwe Covid19 liwukhahlameza kanjani umqondo kulabo abaphila namahlalakhona.
3. Ukuhlolisisa ukuthi imindeni kanye nesimo senhlalo kulabo abatheleleke ngaleligciwane bakhahlamezeke kanjani.
4. Ukuqondisisa ukuthi labo abathelelekile, kanye nalabo abakhahlamezwe ilolubhubhane, bakuthola ukulashwa ngesikhathi salolubhubhane.
5. Ukuhlolisisa kabanzi ezinye izindlela ezehlukile abantu abazisebenzisile ukuzigcina bephilile.
6. Ukwenza iziphakamiso mayelana nokuphakanyiswa kwezempilo kulabo abakhahlamezwe ilolubhubhane babuye babe namahlalakhona.

Sicela uqaphele uhla olulandelayo ukuze ufaneleke ukuba ingxeke yalolu cwanningo.

- Iziguli zomtholampilo I Grove- end Public health community clinic.
- Iziguli ezitheleleke ngobhubhane I Covid-19 ezinyangeni ezintathu ezedlule.
- Bonke ubuhlanga buvumelekile ukuba ingxenye yalolucwanningo.
- Kumele ukwazi ukukhuluma ulimi lwesingisi noma olimi lwesiZulu.
- Kumele kube ukuthi uyavuma ukuba ingxenye yalolucwanningo.
- Isiguli esineminyaka engaphezulu kweyishumi nesishiyagalombili (18)

Uma uhla lwamagama angaphezulu engakuvumeli, akumele ube ingxenye yalolucwanningo.

Lolucwanningo luzoba nengxoxo phakathi kwakho nomcwanningi, ngaphambi kokuba ingxoxo iqale umcwanningi uzokunikeza ithuba lokuba ufunde uhla lwemibuzo uzilungiselele. Ngaphambi kokuqala ingxoxo, umcwanningi uzoqale akunikeze incwadi yesivumelwano sokuba

ingxenye yalolucwaningo ukuze ubeke uphawu lwesivumelwano. Uma sengithole isivumelwano sakho sokuba ingxenye yocwaningo ngizohlela isikhathi nendawo yengxoxo ngokuvumelana nawe. Ingxoxo izothatha isikhathi esingangehora elilodwa. Lolucwaningo luzodinga abantu abayishumi nesithupha(16)

Ubungozi ngenxa yocwaningo: Abukho ubungozi bomzimba obukhona kulolucwaningo,uma kukhona ukuhlukumezeka kokomqondo,uzokuthola ukwelulekwa ngokomqondo.

Izizathu zokushiya Ucwaningo kothe wazibandakanya: Uvumelekile ukuphuma kucwaningo noma inini ngaphandle kwesijeziso.

Inzuzo: ulwazi oluyotholakala kulolucwaningo emveni kwemibuzo mpendulo luyosiza ekuphuculeni ulwazi nge Covid-19 ezweni lakithi iNingizimu Afrika kanye nomhlaba wonke.

Inkokhelo: Ayikho Inkokhelo etholwa yilowo ozibandakanyayo kulolucwaningo.

Izindleko zalolucwaningo: Akukho zindleko okulindeleke ukuba uzikhokhe kulolucwaningo

Imfihlo: Imininingwane yakho yobunikazi izohlala ifihlekile kunanoma ubani ofunda imiphumela yalolucwaningo. Uzonikezwa inombolo yokufihla ubunikazi,okuyiyo eyovela kwimiphumela yalolucwaningo.Ingxoxo izoqoshwa bese iyavikelwa ngamagama athile okufihla ulwazi azobe aziwa ngumcwaningi yedwa. Amapheshana kanye nakho konke okusetshinzisiwe ukuqopha ingxoxo kuyakuvalwa ekhabetheni eliyimfihlo, kodwa uma ukudinga uyakukhonjiswa kona.

Imiphumela: Imiphumela yalolucwaningo izoshicilelwa kumtapho wolwazi kwisikhungo sezemfundo ephakeme I Durban University of Technology kanye nakwincwadi yokuloba izigigaba.

Ubungozi nokulimala okuqondene nocwaningo: Ngenxa yendlela yalolucwaningo abukho ubungozi obulindelekile nokulimala okulindelekile ngenxa yokuzibandakanya.

Ukugcinwa kwamaphepha kanye nokuqoshiwe:Amapheshana kanye nakho konke okusetshinzisiwe ukuqopha ingxoxo kuyakuvalwa ekhabetheni eliyimfihlo,emva kweminyaka emihlanu konke lokhu kuyaku ckelwa phansi.

Abantu ongaxhumana nabo uma Kukhona ofuna ukukubuza noma uma kubanenkinga: Uyacelwa ukuba uthinte umcwaningi: Sunil Neerputh ku 0643761323, umhloli omkhulu Usolwazi Raisuah Bhagwan ku 0313732197 noma I Institutional Research Ethics administrator kulenombolo 031 373 2375. Izikhalazo zingabikelwa umqondisi: Research and Postgraduate Support, Dkt L Linganiso on 031 373 2577 or researchdirector@dut.ac.za.

Appendix A3: Letter of information – Research assistant



Letter of information: Research assistant

Title of the Research Study: Living with co-morbidities during the COVID-19 pandemic: a qualitative study of the heightened physical and psycho-social challenges emerging from the virus.

Principal Investigator/s/researcher: Sunil Neerputh (MTech: Homoeopathy)

Co-Investigator/s/supervisor/s: Supervisor: Professor Raisuyah Bhagwan (PhD: Community Health Studies)

Co-supervisor: Professor Firoza Haffeejee (PhD: Health Science)

Brief Introduction and Purpose of the Study: The COVID-19 pandemic began in December 2019 in the city of Wuhan, China and has spread rapidly throughout the world causing widespread catastrophe on a global scale. COVID-19 has caused disruption amongst people especially affecting the physical and mental health as well as their livelihoods. There is evidence in research that shows how COVID-19 has affected people with co-morbidities in terms of physical health. Co-morbidities is the presence of two or more medical conditions that are present in an individual at any given time e.g. Hypertension and Diabetes. Little research has been done to explore the effect on the mental and physical well-being of patients and psycho-social challenges these people with co-morbidities face. The purpose of this research study is to understand from the individual's point of view, what effect COVID-19 had on their, physical health and psycho-social well-being. The other aspect of this study will be to explore how people received medical care during the pandemic as well as what alternate treatments people used.

Greeting: Good Day. I am a student at the Durban University of Technology, and I am conducting research for my PhD. I would like to invite you to participate in my research.

What is Research: Research is a systematic search or enquiry for generalized new knowledge.

Outline of the Procedures: The purpose of this research study is to understand from participants point of view, what effect COVID-19 had on their physical health and psycho-social well-being. The other aspect of this study will be to explore how they received medical care during the pandemic as well as what alternate treatments people used.

Aim:

To understand how the COVID-19 pandemic affected the physical and psycho-social well-being of people living with a co-morbidity.

Objectives:

7. To enquire how COVID-19 affected the physical health of persons with a comorbidity.

8. To understand how COVID-19 affected the mental health of these infected and affected persons with a co-morbidity.
9. To explore how the family and social life of these persons were affected by the virus.
10. To understand how those infected and affected received healthcare within the context of the pandemic.
11. To explore what alternative and holistic therapies both infected and affected persons used to ensure their optimal health.
12. To make recommendations with regards to improving the holistic well-being of those recovered and affected persons with comorbidities.

Please note the following information regarding eligibility which allows patients to participate in the study:

- Patients of the Grove-end Public Health Community Clinic
- Patients Affected and infected by COVID-19
- All races
- All ethnicities
- English and isiZulu speaking participants
- Patients consenting to the study
- Patients above the age of 18

If they do not meet the above requirement they cannot participate in the study.

The research will consist of an interview schedule that will be given to the participant to read through before the commencement of the actual interview. Before the interview commences I will have to obtain the signed consent letter from the participant which allows me to interview them.

Upon agreement to do the interview, I will arrange a time and location for the interview at the participants convenience and preference. The interview will be approximately one hour.

The number of participants intended for this study is approximately 16.

Risks or Discomforts to the Participant: There is no physical risk intended towards the participant. If any psychological trauma or discomfort is brought up during the interview, the participant will be referred for counselling.

Explain to the participant the reasons he/she may be withdraw from the Study: The participant may freely withdraw from the study at any time during the course of the study if they wish to do so. If I feel necessary I will withdraw the participant from the study.

Benefits: The benefit of this research is that it will enhance the medical knowledge of COVID-19 within South Africa and on an international level.

Remuneration: There is no remuneration for this study.

Costs of the Study: There is no cost intended from the participant.

Confidentiality: The research participant's identity will remain anonymous to people who intend to read the final research report in the form of a dissertation. The participant will be referred to as numbers with a pseudonym in the dissertation. The interviews on audio recording will be backed on an external hard drive and will be password protected. The hard drive and any written notes during the interview will be locked in a cabinet. The participant may be given access their own data if they require.

Results: The results of the research will be made available in the form of a dissertation through the Durban University of Technology as well as in the form of journal articles.

Research-related Injury: It is intended that there will be no research related injury

Storage of all electronic and hard copies including tape recordings: The data from the research which are audio recorded interviews and hand written notes will be stored in a locked cabinet. The audio recorded interviews will be backed up onto an external hard drive and password protected. After a 5 year period all audio recordings will be deleted and hand written notes will be shredded.

Persons to contact in the Event of Any Problems or Queries: Please contact the researcher, Sunil Neerputh on 064 376 1323, my supervisor Raisuah Bhagwan on or the Institutional Research Ethics Administrator on 031 373 2375. Complaints can be reported to the Director: Research and Postgraduate Support Dr L Langaniso on 031 373 2577 or researchdirector@dut.ac.za.

Appendix B1: Letter of consent in english



Letter of consent: Participants affected and infected

Full Title of the Study: Living with co-morbidities during the COVID-19 pandemic: a qualitative study of the heightened physical and psychosocial challenges emerging from the virus

Names of Researcher/s: Sunil Neerputh

Statement of Agreement to Participate in the Research Study:

- I hereby confirm that I have been informed by the researcher, Sunil Neerputh, 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 computerised 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 Thumbprint	Date	Time	Signature /	Right

I, Sunil Neerputh _____ herewith confirm that the above participant has been fully informed about the nature, conduct and risks of the above study.

_____	_____	_____
Full Name of Researcher	Date	Signature
_____	_____	_____
Full Name of Witness (If applicable)	Date	Signature

Appendix B2: Letter of consent in isiZulu



Isivumelwano sokuzibandakanya: Ababambiqhaza abathintekile futhi bangenwe yilesi sifo

Isihloko socwaningo: Ukuphila namahlalakhona Ngesikhathi sobhubhane I Covid-19: Lolu cwaningo lwesikhwalthi lugxile kakhulu ekubhekeni izinkinga zomzimba, ezomqondo kanye nezenhlalo ezilethwa ileligciwane.

Umcwaningi omkhulu: Mnu. Sunil Neerputh

Isitatimende sokukuvuma ukuzibandakanya kulolucwaningo:

- Ngimilana ngiyavuma ukuthi ngazisiwe umcwaningi u, Sunil Neerputh mayelana nohlobo, indlela, inzuzo kanye nencuphephe yalolucwaningo- inombolo ye Research Ethics Clearance: _____,
- Ngilitholile, futhi ngiyifundile incwadi yokwazisa ngokuzibandakanya kulolucwaningo ngaba nokuqondisisa okuphelele mayelana nalolucwaningo.
- Nginakho ukuqonda ngemiphumela yalolucwaningo, ukubandakanya ubulili, iminyaka, unyaka wokuzalwa, amashiyali ami nokudalulwa kwesigulo sami ukuthi kuyobe sekudidiyelwa ukwenza umbiko ngalolucwaningo.
- Ekwazini ngezidingo zalolucwaningo, ngiyanikeza igunya lokuba ulwazi ngami olutholakalyo ludidiyelwe bese luhlaziywa ngekhompuyutha nguye umcwaningi.
- Ngingahoxa ukuba ngizibandakanye kulolucwaningo noma inini, ngaphandle kokuba ngicwaswe kulolucwaningo.
- Sengibe nesikhathi nethuba elanele lokuba ngibuze imibuzo (futhi ngentando yami) ngizikhethela mina ukuba ngizibandakanye kulolucwaningo.
- Nginyaqonda ukuthi kusangatholakala ulwazi olubalulekile olusha oluphathelele nalolucwaningo, lolo lwazi ngiyokwazi ukuluthola uma ngiludinga.

Igama eliphelele lalona

Usuku

Isikhanthi

uphawu lokusayina/ isithupa

Ozibandakanyayo

sesandla sokudla

Mina, Sunil Neerputh ngiyaqinisekisa ukuthi lona ongenhla obambe iqhaza kulesi Sifundo wazisiwe ngemvelo Kanye nobungozi baso lesi Sifundo

Amagama aphelele omcwaningi

Omkhulu

Usuku

ukusayina

Amagama aphelele afakazi

Usuku

ukusayina

Appendix B3: Letter of consent – Research assistant



Letter of consent: Research assistant

Full Title of the Study: Living with co-morbidities during the COVID-19 pandemic: a qualitative study of the heightened physical and psycho-social challenges emerging from the virus

Names of Researcher/s: Sunil Neerputh

Statement of Agreement to Participate in the Research Study:

- I hereby confirm that I have been informed by the researcher, Sunil Neerputh, 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 computerised 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 Thumbprint	Date	Time	Signature / Right

I, Sunil Neerputh herewith confirm that the above participant has been fully informed about the nature, conduct and risks of the above study.

_____	_____	_____
Full Name of Researcher	Date	Signature
_____	_____	_____
Full Name of Witness (If applicable)	Date	Signature

Appendix C2: Letter to the gatekeeper – Department of health

[22 May 2021]

68 Elfgrove

Stanmore

Phoenix

4068

Request for Permission to Conduct Research

Dear Department of Health

My name is Sunil Neerpath, a PhD Health Science student at the Durban University of Technology. The research I wish to conduct for my Doctoral study involves a study of those living with co-morbidities during the COVID-19 pandemic. It is a qualitative study of the heightened physical and psychosocial challenges patients faced from the virus.

I am hereby seeking your consent to access patients at the Grove End Public Health Community Clinic to conduct interviews to answer the above gap in medical research knowledge.

I have provided you with a copy of my proposal which includes copies of the data collection tools and consent and/ or assent forms to be used in the research process, as well as a copy of the approval letter which I received from the Institutional Research Ethics Committee (IREC).

If you require any further information, please do not hesitate to contact me using my cell phone number on 064 376 1323 and email: sunilneerpath@gmail.com. Thank you for your time and consideration in this matter.

Yours sincerely

Sunil Neerpath

Durban University of Technology

Appendix D1a: Interview schedule in english - Participants affected

Hello, I'm so glad I can speak with you today about your experiences with COVID-19. Thank you for participating in this study.

Interview schedule – 1 (Affected)

1. What chronic diseases do you have?
2. Are you on medication for this? Where do you obtain your medication?
3. Has the COVID-19 pandemic affected you obtaining the medication at the required time?
 - a. Probe: ask them to elaborate on how they have been affected
 - b. Were the queues longer than normal?
 - c. Was the clinic open/ closed during the lockdown?
 - d. Did you miss any medication/ for how long?
4. Can you share with me your experiences of living with a comorbidity.
5. Describe how COVID-19 has affected your physical health even though you were not directly infected by COVID-19 especially with a comorbidity.
6. How has COVID-19 affected your mental and emotional health even though you were not directly infected by the virus.
7. Did any of your family/ close friends have COVID-19?
 - a. Probe: How did this affect you?
 - b. Did you have to take care of them/ obtain medication for them?
 - c. If yes, explain how you did this and how it and how it affected your daily functioning.
8. Can you share any anxieties you faced during the pandemic.
9. Describe the challenges you have face in-terms of your livelihood, like financial struggles, well-being, attaining basic needs.
10. What is your view on how you received medical care throughout the pandemic and lockdown periods.
11. Did you experience any difficulty in getting the medication for your comorbidity?

Probe:

- a. What comorbidities do you have?
- b. Where do you normally obtain these medications?
- c. Were there specific difficulties? (transport/ longer queues than normal/ closure of clinic during lockdown).
- d. How were the difficulties in c above overcome?

- e. Did you use any alternative therapies for your comorbidity?

Elaborate on these and state what these are.

- 12. Did you use alternative therapies as a preventative measure for COVID-19?

How often/ when did you use these?

- 13. Do you use any alternative therapies for your chronic condition?

- a. Name these.
- b. Where/who do you obtain these from?
- c. Who introduced you to these?

Appendix D1b: Interview schedule in english - Participants infected

Hello, I'm so glad I can speak with you today about your experiences with COVID-19. Thank you for participating in this study.

Interview schedule – 2 (Infected)

1. What chronic diseases do you have?
2. Are you on medication for this? Where do you obtain your medication?
3. Has the COVID-19 pandemic affected you obtaining the medication at the required time?
 - a. Probe: ask them to elaborate on how they have been affected
 - b. Were the queues longer than normal?
 - c. Was the clinic open/ closed during the lockdown?
 - d. Did you miss any medication/ for how long?
4. Can you share with me your experiences of living with a co-morbidity.
5. Describe how COVID-19 has affected your physical health since being infected by COVID-19 especially with a co-morbidity.
6. How has COVID-19 affected your mental and emotional health since being infected by the virus.
7. Did any of your family/ close friends have COVID-19?
 - a. Probe: How did this affect you?
 - b. Did you have to take care of them/ obtain medication for them?
 - c. If yes, explain how you did this and how it affected your daily functioning.
8. Can you share any anxieties you faced while being infected.
9. Describe the challenges you have faced in-terms of your livelihood, like financial struggles, well-being, attaining basic needs.
10. What is your view on how you received medical care throughout the pandemic and lockdown periods.
11. Did you experience any difficulty in getting the medication for your comorbidity?

Probe:

- a. What comorbidities do you have?
- b. Where do you normally obtain these medications from?
- c. Were there specific difficulties? (transport/ longer queues than normal/ closure of clinic during lockdown).
- d. How were the difficulties in c above overcome?
- e. Did you use any alternative therapies for your comorbidity?

Elaborate on these and state what these are.

12. What type of alternate therapies did you use while you were infected by

COVID-19? How have they helped?

13. Do you use any alternative therapies for your chronic condition?

a. Name these.

b. Where/ who do you obtain these from?

c. Who introduced you to these?

14. Can you describe your journey to recovery.

Appendix D2a: Interview schedule in isiZulu – Participants affected

Abahlanganyeli abathintekile

Ngiyakubingelela. Ngijabule kakhulu ukuthi ngikwazi ukukhuluma nawe namuhlanje mayelana nolwazi onalo ngesifo I Covid-19

Uhlelo lwengxoxo-(Abathintekile)

1. Ngesiphi isifo esingamahlalakhona onaso
2. Lesi sifo kungabe uyasidlela yini imishanguzo? Uyithola kuphi imishanguzo yakho?
3. Kungabe ubhubhane I Covid-19 luphazamisile yini ukulanda imishanguzo yakho?
 - a) Hloisisa: ngiyacela ukuba uchaze kabanzi ukuthi kuphazamiseke kanjani.
 - b) Kungabe ulayini wokulanda imishanguzo ubumude kunokujwayelekile?
 - c) Kungabe umtholampilo ubuvuliwe noma uvaliwe ngesikhathi sokuvalwa kwezwe?
 - d) Ikhona yini imishanguzo ekweqile/ isikhathi esingakanani?
4. Ngicela wabelane nami ngohlangabezane nakho njengoba uphila namahlalakhona.
5. Ngiyacela ukuba uchaze ukuthi kungabe iCovid-19 ukuhlukumeze kanjani ngokomzimba yize lingakuhlukumezanga ngqo igciwane njengoba uphila namahlalakhona.
6. Kungabe ikuhlukumeze kanjani I Covid-19 ngokomqondo kanye nokumphefumulo, yize ingakuhlukumezanga ngqo njengoba uphila namahlalakhona.
7. Kungabe kukhona yini obephethwe isifo I Covid-19 kumndeni wakho okanye abangane abaseduzane nawe?
 - a) Hloisisa: Kungabe lokhu kwakuhlukumeza kanjani wena?
 - b) Kungabe ububanakekela noma ubukade ubalandela imishanguzo?
 - c) Uma kunjalo, iphazamiseke kanjani imisebenzi yakho yemihla ngemihla?
8. Ngicela wabelane nami ukukhathazeka obe nakho ngalesi sikhathi sobhubhane I Covid-19.
9. Ngiyacela ukuba uchaze izingqinamba ohlangabezane nazo ngempilo yakho yamihlangemihla, lapho singabala khona izinkinga zemali, izinkinga zokuthola izidingo ngqangi.
10. Uthini umbono wakho ngendlela obuthola ngayo imishanguzo ngesikhathi sobhubhane kanye nesokuvalwa kwezwe?
11. Kungabe kukhona ubunzima obenakho ekutholeni imishanguzo yakho yamahlalakhona?

- a) Ngamaphi amahlalakhona onawo?
 - b) Uyithola kuphi imishanguzo yakho?
 - c) Kungabe zikhona izingqinamba ohlangabezane nazo? (lapho sibala: izithuthi, ulayini omude kunokujwayelekile noma ukuvalwa komtholampilo ngesikhathi sokuvalwa kwezwe.
 - d) Kungabe izinkinga owabhekana nazo kumbuzo ongaphezulu (c) wazinqoba kanjani?
 - e) Kungabe kukhona yini izindlela ezehlukile zokulapha amahlalakhona onawo ? uyacelwa ukuba wenabe ngazo, ungichazele nokuthi zingeziphi.
12. Kungabe kukhona izindlela ezehlukile obuzisebenzisa ukuvikela I Covid-19?, usuzisebenzise isikhathi esingakanani?, uzisebenzise nini lezindlela?
13. Kungabe zikhona yini ezinye izindlela zokulapha ozisebenzisayo ukwelapha amahlalakhona akho?
- a) Ngiyacela ukuba uzibale.
 - b) Lezindlela uzithola kuphi noma kubani?
 - c) Ubani owakwazisa ngalezi zindlela zokulapha?

Appendix D2b: Interview schedule in isiZulu – Participants infected

Abahlanganyeli abatheleleke

Ngiyakubingelela. Ngijabule kakhulu ukuthi ngikwazi ukukhuluma nawe namuhlanje mayelana nolwazi onalo ngesifo I Covid-19

Uhlelo lwengxoxo-(Abathelelekile)

1. Ngesiphi isifo esingamahlalakhona onaso
2. Lesi sifo kungabe uyasidlela yini imishanguzo? Uyithola kuphi imishanguzo yakho?
3. Kungabe ubhubhane I Covid-19 luphazamisile yini ukulanda imishanguzo yakho?
 - a) Hloisisa: Uyacelwa ukuba uchaze kabanzi ukuthi kuphazamiseke kanjani.
 - b) Kungabe ulayini wokulanda imishanguzo ubumude kunokujwayelekile?
 - c) Kungabe umtholampilo ubuvuliwe noma uvaliwe ngesikhathi sokuvalwa kwezwe?
 - d) Ikhona yini imishanguzo ekweqile/ isikhathi esingakanani?
4. Ngicela wabelane nami ngohlangabezane nakho njengoba uphila namahlalakhona.
5. Ngiyacela ukuba uchaze ukuthi kungabe iCovid-19 ukuhlukumeze kanjani ngokomzimba ngemuva kokutheleleka ngegciwane njengoba uphila namahlalakhona.
6. Kungabe ikuhlukumeze kanjani I Covid-19 ngokomqondo kanye nokumphefumulo, ngemuva kokutheleleka ngegciwane le Covid-19 ube uphila namahlalakhona.
7. Kungabe kukhona yini obephethwe isifo I Covid-19 kumndeneni wakho okanye abangane abaseduzane nawe?
 - a) Hloisisa: Kungabe lokhu kwakhlukumeza kanjani wena?
 - b) Kungabe ububanakekela noma ubukade ubalandela imishanguzo?
 - c) Uma kunjalo, iphazamiseke kanjani imisebenzi yakho yemihla ngemihla?
8. Ngicela wabelane nami ukukhathazeka obe nakho ngalesi sikhathi uthelekile ngobhubhane I Covid-19.
9. Ngiyacela ukuba uchaze izingqinamba ohlangabezane nazo ngempilo yakho yamihlangemihla,lapho singabala khona izinkinga zemali, izinkinga zokuthola izidingo ngqangi.
10. Uthini umbono wakho ngendlela obuthola ngayo imishanguzo ngesikhathi sobhubhane kanye nesokuvalwa kwezwe?
11. Kungabe kukhona ubunzima obenakho ekutholeni imishanguzo yakho

- yamahlalakhona?
- a) Ngamaphi amahlalakhona onawo?
 - b) Uyithola kuphi imishanguzo yakho?
 - c) Kungabe zikhona izingqinamba ohlangabezane nazo? (lapho sibala: izithuthi, ulayini omude kunokujwayelekile noma ukuvalwa komtholampilo ngesikhathi sokuvalwa kwezwe.
 - d) Kungabe izinkinga owabhekana nazo kumbuzo ongaphezulu (c) wazinqoba kanjani?
 - e) Kungabe kukhona yini izindlela ezehlukile zokulapha amahlalakhona onawo ? uyacelwa ukuba wenabe ngazo, ungichazele nokuthi zingeziphi.
12. Kungabe kukhona izindlela ezehlukile obuzisebenzisa ukwelapha I Covid-19?, kungabe zakusebenzela kanjani?
13. Kungabe zikhona yini ezinye izindlela zokulapha ozisebenzisayo ukwelapha amahlalakhona akho?
- a) Ngiyacela ukuba uzibale.
 - b) Lezindlela uzithola kuphi noma kubani?
 - c) Ubani owakwazisa ngalezi zindlela zokulapha?
14. Ngiyacela ukuba unabe kafushane ngokwelulama kwakho kulesi sifo?

Appendix E: Editors certificate

Sury Bisetty Academic Editing Services

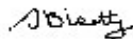
CIPC No. 2021/360666/07



The pen is mightier than the sword

To whom it may concern

I edited the thesis titled: Living with co-morbidities during the COVID-19 pandemic: a qualitative study of the heightened physical and psychosocial challenges emerging from the virus by Sunil Neeruputh student number: 21356157, submitted in compliance with the requirements for a PhD in the Faculty of Health Sciences at the Durban University of Technology



Sury Bisetty
Professional Language and Technical Editor

Date: 12 February 2024

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Disclaimer: Please note, I provided language and technical editing as per discussion with the client. The content and structure of the article were not amended in any way. The edited work described here may not be identical to that submitted. The author, at his/her sole discretion, has the prerogative to accept, delete, or change amendments/suggestions made by the editor before submission.

My editing adds tremendous value to your document, but I am only human. Although I rigorously check and recheck my work, it is impossible to guarantee 100% perfection.

Appendix F: Gatekeep permission

ETHEKWINI MUNICIPALITY
Community & Emergency Services Cluster
Health Unit

9 Archie Gumede Place
Durban 4001
P O Box 2443
Durban 4000
Tel: (031) 311 3505
Fax: (031) 311 3710
Website:
<http://www.durban.org.za>



Ref. No. 30/1/1 / 6/3/1

To: Sunil Neerpath

15 March 2022

Dear Researcher,

Subject: Approval of a Research Proposal

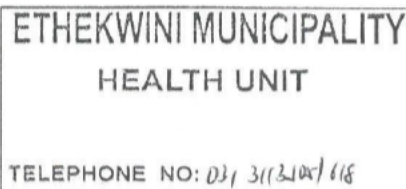
The Research Proposal Titled: **"Living with co-morbidities during the COVID-19 pandemic: a qualitative study of the heightened physical and psycho-social challenges emerging from the virus."** was reviewed by the eThekweni Municipal Health Department Research Committee. The study is hereby **approved to be conducted Grove End Clinic** and is valid until **01 March 2023**.

The following conditions need to be noted:

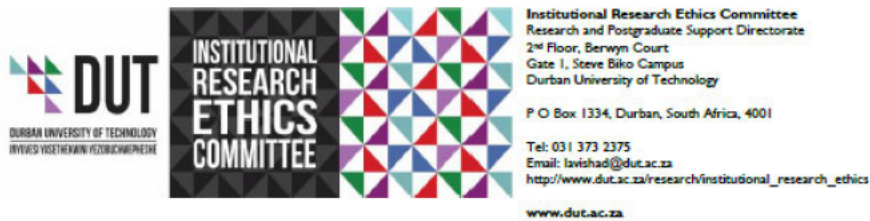
- Submission of the indemnity form obtainable from the eThekweni Municipality Health Unit before commencement of the study.
- Prior arrangements to be made with the facility and an assurance that clinic services will not be disrupted.
- No staff member should be used for collecting data for the researchers.
- **Progress reports to be provided and the final report of the study to the eThekweni Municipality Health Unit or emailed to: Bongi.Ntombela@durban.gov.za**
- Obtain permission from the eThekweni municipality health department for press releases and release of results to communities/stakeholders.
- The department has to receive recognition for the assistance given.
- Any amendment to the study must be communicated with the eThekweni Municipality Health Unit and the relevant amendment form obtainable from the unit to be submitted.
- Withdrawal of permission to conduct research will be left to the discretion of the eThekweni Municipality Health Unit.
- **Please take note of the duration of the study approval.**
- **An extension may be applied for if required. The Committee will review such a request and provide feedback accordingly.**

Yours sincerely

Mrs. Rose Van Heerden: Head of Health



Appendix G: Ethics approval (IREC)



1 March 2022

Mr S Neerupth
169 Batommore Crescent

Dear Mr Neerupth

Living with co-morbidities during the COVID-19 pandemic: a qualitative study of the heightened physical and psycho-social challenges emerging from the virus
Ethical Clearance number **IREC 232/21**

The Institutional Research Ethics Committee acknowledges receipt of your gatekeeper permission letter.

Please note that FULL APPROVAL is granted to your research proposal. You may proceed with data collection.

Any adverse events [serious or minor] which occur in connection with this study and/or which may alter its ethical consideration must be reported to the IREC according to the IREC Standard Operating Procedures (SOP's).

Please note that any deviations from the approved proposal require the approval of the IREC as outlined in the IREC SOP's.

Yours Sincerely

Prof J K Adam
Chairperson: IREC