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The impact of COVID-19 on depression, anxiety, and post-traumatic stress levels in
Doctors and Nurses at a South African health facility.

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the requirements for the Master's degree in Public Health in the Faculty of Health
Sciences at the University of Fort Hare

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Declaration of Authenticity

I, the undersigned Kelebogile Finger-Motsepe, student number 202015407, hereby declare that this mini dissertation entitled: The impact of COVID-19 on depression, anxiety and post-traumatic stress levels in Doctors and Nurses at a South African health facility, is my own unique work and all ideas that were adopted were recognised by means of referencing the sources in the reference list as well as in the text. This research document has not been and will not be presented or submitted for other awards.



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I, Kelebogile Finger-Motsepe, student number 202015407, admit to the fact that duplicating another person's work and presenting it as mine is not acceptable; it is regarded as a means of plagiarism. I did not permit anyone to use my assignment with the aim of passing it as their own work. The work that I present here is of my own resourcefulness and creativity, and I have not used another person's or student's work as my own. I proclaim that when rewording someone else's material, I gave those people the expected commend by mentioning their names.



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Declaration on Research Ethical Clearance

I, Kelebogile Finger-Motsepe, student number 202015407, hereby declare that I am fully aware of the University of Fort Hare's policy on research ethics, and I have taken every precaution to comply with the regulations. I have obtained an ethical clearance certificate from the University of Fort Hare's Research Ethics Committee, and my reference number is (R100118-054#2021=09=03=FingerMotsepeK).



Signature: Date: 15th December 2022

Dedication

- I dedicate my dissertation work to God Almighty, my Creator, and Pillar of strength, my Source of Inspiration.
- To my loving family, a special feeling of gratitude to my mother, Badidimetse Finger, whose words of encouragement and push for tenacity ring in my ears.
- My husband, Ntsie Motsepe, your support was out of this world, you made sure that I gave it my all finish. You stood by me when things looked bleak. I'm truly thankful.
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- Lastly, to my Sons, Kamohelo and Oatshegofatsa, who have been affected in every way possible by this quest. Thank you. My love for you all can never be quantified.

God Bless you all.

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May God bless you all.

Abstract

Abstract:

Introduction: The emergence of the coronavirus disease of 2019 (Covid-19) has wrought profound and enduring transformations in global health, economic dynamics, and social interactions. However, the comprehensive quantification of the psychological repercussions of the Covid-19 pandemic remains elusive and is poised to compound the preexisting burden of mental health disorders within the general populace. Elevated transmission rates, rapid disease progression within vulnerable demographics, and the absence of definitive curative or preventive measures have collectively contributed to a heightened worldwide state of stress and anxiety. Extensive research has demonstrated that the apprehension and stress associated with Covid-19 are markedly pronounced among healthcare professionals, commonly referred to as front-line workers, in comparison to the general population. The Covid-19-related psychological distress is anticipated to act as a catalyst, exacerbating mental health conditions within high-risk groups.

Aims and Objectives: This study endeavours to ascertain the prevalence and severity of depression, anxiety, and post-traumatic stress disorder (PTSD) among medical doctors and nurses employed at a regional hospital in South Africa.

Methodology: A cross-sectional investigation was conducted to evaluate the presence of anxiety, depression, and stress symptoms among medical doctors and nurses working at a Regional Hospital situated in the Free State Province of South Africa. A purposive sample of 200 participants, comprising all willing doctors and nurses employed at the study site, was enrolled in the study.

Findings: The participants exhibited an average age of 42 years and an average tenure of approximately 72 months at the hospital. The majority of participants were of African descent, with a male-to-female ratio of 1:2.3. Female healthcare workers reported significantly higher instances of PTSD than their male counterparts. In the aggregate, 71.4% of doctors reported symptoms indicative of depression, 73.2% reported anxiety-related symptoms, and 19.6% reported PTSD-related symptoms. Among nurses, 72% displayed clinically significant symptoms of depression, 81%

exhibited anxiety-related symptoms, and 27.7% manifested symptoms suggestive of PTSD. A moderately robust positive correlation was discerned between PTSD and Anxiety ($p = .000$; $r = .466$) as well as PTSD and Depression ($p = .000$; $r = .315$). Additionally, a strong positive correlation was identified between Anxiety and Depression ($p = .000$; $r = .631$). A statistically significant disparity ($p = .030$) in anxiety levels was observed among workers in different risk-prone areas. Nurses reported substantially higher levels of anxiety ($p = .039$; $M = 10.63$, $sd = 4.03$) compared to doctors ($M = 9.01$, $sd = 3.80$) and administrators ($M = 10.50$, $sd = 4.32$). Moreover, both nurses ($M = 27.06$, $sd = 13.61$) and administrators ($M = 33.33$, $sd = 14.44$) exhibited significantly higher instances of PTSD ($p = .003$) than doctors ($M = 19.96$, $sd = 15.03$).

Conclusions: The healthcare workers under scrutiny reported elevated levels of anxiety and depression attributable to the Covid-19 pandemic, although the prevalence of posttraumatic stress symptoms was comparatively lower within the hospital setting. Furthermore, this study illuminates that depressive, anxiety, and post-traumatic stress symptoms were more prevalent among nurses than doctors. Additionally, healthcare professionals operating in high-risk Covid-19 environments, such as the Covid-19 ward, demonstrated heightened levels of anxiety when juxtaposed with their counterparts stationed in low-risk Covid-19 areas within the healthcare facility.

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Abbreviations

DSM-V	Diagnostic Statistical Manual - 5
GHQ-12	General Health Questionnaire - 12
HADS	Hospital Anxiety and Depression Scale
PCL-5	Post-traumatic stress checklist - 5
PHQ-9	Patient Health Questionnaire – 9
GAD-7	Generalised Anxiety Disorder-7
PPE	Personal Protective Equipment
PTSD	Post-traumatic stress disorder
WHO	World Health Organization

CHAPTER 1

INTRODUCTION AND BACKGROUND OF THE STUDY

1.1 Introduction

The emergence of the coronavirus disease of 2019 (Covid-19) has brought about enduring and transformative changes in global health, economic activity, and social interactions (Xiong et al., 2020; Talevi et al., 2020; Horesh and Brown, 2020; Rossi et al., 2020; Kathirvel, 2020). However, the comprehensive quantification of the psychological impact of the Covid-19 pandemic remains elusive and is likely to exacerbate the existing burden of mental illness within the general population (Xiong et al., 2020; Talevi et al., 2020; Horesh and Brown, 2020; Rossi et al., 2020; Kathirvel, 2020). Elevated transmission rates, rapid disease progression within specific vulnerable demographics, and the absence of a cure or vaccine have collectively contributed to an elevated global state of stress and anxiety (Xiong et al., 2020; Horesh and Brown, 2020; Lee, 2020; Kathirvel, 2020). Covid-19 mortality has reached 10% in some countries and affects approximately 20% of healthcare workers (Sher, 2020; Giusti et al., 2020).

Covid-19 was initially identified as an atypical pneumonia outbreak in Wuhan, China in 2019, and the causal agent was designated as the novel coronavirus strain (SARS-CoV-2), which rapidly disseminated across the globe (Talevi et al., 2020). Consequently, on March 11, 2020, the World Health Organization (WHO) declared Covid-19 a global pandemic (Talevi et al., 2020; Horesh and Brown, 2020). Numerous countries implemented national lockdown measures to curtail the spread of the virus, with South Africa enacting such measures on March 27, 2020 (The Presidency, Republic of South Africa, 2020). The South African national lockdown was implemented with the aim of reducing Covid-19 community transmission and alleviating the strain on its already overwhelmed healthcare facilities (The Presidency, Republic of South Africa, 2020).

1.1.1 Mental Health in non-health workers

The viral outbreak has exerted a profound negative impact across all sectors of the economy, swiftly depleting the resources of numerous nations (Xiong et al., 2020; Talevi et al., 2020; Horesh and Brown, 2020; Rossi et al., 2020; Kathirvel, 2020). The widespread loss of employment and the continuously evolving understanding of the Covid-19 disease process have engendered concern, fear, stress, and uncertainty within all segments of the general population (Horesh and Brown, 2020). Research has demonstrated that the apprehension and stress associated with Covid-19 are notably heightened among healthcare professionals, commonly referred to as front-line workers, in comparison to the general population (Sher, 2020; Giusti et al., 2020). Furthermore, Covid-19-related psychological stress is anticipated to act as a catalyst, exacerbating mental health conditions within high-risk groups (Sher, 2020; Mazza et al., 2020; Giusti et al., 2020). For instance, in the Canadian population, the incidence of suicidal ideation resulting from unemployment is expected to increase five-fold during the pandemic, with analogous trends projected for the United States, India, Pakistan, France, Germany, and Italy (Xiong et al., 2020).

The highest prevalence of anxiety, stress, and post-traumatic stress symptoms, as evidenced by a systematic review involving 93,569 participants, was found to be 50.9%, 81.9%, and 53.8%, respectively, across both developed and developing countries (Xiong et al., 2020). Vulnerable individuals encompass those aged less than or equal to 40 years of the female gender, with pre-existing psychiatric illnesses or comorbidities, experiencing unemployment, enrolled as students, employed in healthcare roles, or frequently exposed to Covid-19-related news (Xiong et al., 2020; Horesh and Brown, 2020). Within a Chinese cohort, 35.1% exhibited symptoms indicative of generalized anxiety disorder, 20.1% displayed signs of depressive symptoms, and 18.2% reported abnormal sleep patterns (Xiong et al., 2020). Notably, abnormal sleep patterns were more pronounced among healthcare professionals (Xiong et al., 2020).

1.1.2 Posttraumatic stress and suicide rates

Horesh and Brown (2020) have advocated for a more expansive conceptualization of stress within the current psychological discourse surrounding Covid-19, emphasizing the potential for the pandemic to induce or result in post-traumatic stress. This viewpoint is substantiated by a survey conducted among Covid-19 survivors, wherein 96.2% exhibited symptoms indicative of post-traumatic stress (Forte et al., 2020; Kaseda and Levine, 2020). Post-traumatic stress disorder (PTSD) ranks as the second most prevalent psychiatric disorder, following depression (Forte et al., 2020; Kaseda and Levine, 2020). According to the Diagnostic Manual for Mental Disorders, 5th edition (DSM-5), PTSD affects 10% of individuals who have experienced a traumatic event at some point in their lifetime (Forte et al., 2020; Kaseda and Levine, 2020). Following the 2003 SARS epidemic in Hong Kong, it was observed that 50% of individuals exhibiting anxiety symptoms subsequently developed anxiety disorders (Kaseda and Levine, 2020).

Covid-19 is characterized by neurological symptoms in approximately 25% of afflicted individuals, and this subset of individuals is associated with a heightened suicide rate when compared to the general population (Sher, 2020). In the United States of America (USA), there is evidence that 90% of individuals who commit suicide have a psychiatric comorbidity, with major depression being comorbid in 60% of all suicide cases (Sher, 2020). Among healthcare workers, the highest suicide rates were reported among anaesthesiologists and psychiatrists in an American cohort (Davis et al., 2003). However, there is a dearth of current data on suicide rates among healthcare workers during the Covid-19 pandemic.

1.1.3 Mental health in health workers (Front-liners)

Healthcare workers, especially during pandemics, contend with prolonged work hours and the inability to maintain physical distancing from patients. Additionally, the availability of personal protective equipment (PPE) may be inconsistent, and when accessible, wearing it for extended periods can be uncomfortable (Giusti et al., 2020). The abrupt onset of the pandemic caught health systems off guard, leaving healthcare

workers feeling disempowered, helpless, and occasionally hopeless (Giusti et al., 2020). This prevailing environment in the healthcare sector heightens the risk of burnout and can precipitate or exacerbate psychiatric disorders (Giusti et al., 2020).

In Wuhan, China, healthcare workers, particularly nurses, reported a depression rate of 50.4%, an anxiety rate of up to 44.6%, and a stress rate of up to 71.5%. Furthermore, insomnia and post-traumatic stress have also become prevalent, affecting 34% and 73.4% of healthcare workers, respectively, within the same population. In an Italian hospital, clinical levels of depression and anxiety were documented at 26.8% and 31.3%, respectively (Rossi et al., 2020). Additionally, 36.7% of healthcare workers reported symptoms indicative of post-traumatic stress (Rossi et al., 2020).

1.2 Research question and Research problem

1.2.1. Research question

Were health care workers in the frontline more likely to develop mental health conditions (depression, anxiety and PTSD) compared to the general population?

1.2.2. Research Problem

Frontline healthcare workers were among the first individuals to encounter the complications and fatalities associated with Covid-19. The evolving and often uncertain knowledge base about the virus, coupled with the absence of a definitive treatment, has been a significant source of stress and anxiety. Moreover, the highly contagious nature of Covid-19 adds to the anxiety and stress experienced by healthcare professionals, who worry about the risk of infection and the possibility of unwittingly transmitting the virus to their families. Despite these psychological and emotional challenges, healthcare workers are expected to maintain composure and provide patient care during the pandemic (Robertson et al., 2020).

As of now, it has been nine months since the initiation of the initial Level 5 lockdown in South Africa, and the country has recently experienced a second wave of infections,

leading to an extended Level 3 lockdown until February 15, 2021. Throughout this period, healthcare workers have been delivering their services under highly stressful and life-threatening conditions. Such prolonged exposure to the pandemic's demands can significantly impact the mental health and well-being of healthcare workers, with limited evidence on the prevalence and status of mental health and well-being among healthcare workers in the Mangaung-district hospitals. According to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) criteria for psychiatric illnesses (American Psychiatric Association, 2013), symptoms of mental health issues, including post-traumatic stress, may begin to manifest after an extended duration of working under such pandemic conditions.

This study seeks to investigate the impact of Covid-19 on the stress, depression, and anxiety levels of healthcare workers in a South African hospital setting. Additionally, it addresses the existing gap in the literature concerning the mental health of healthcare workers in the context of the Covid-19 pandemic.

1.3 Aim of the study

The aim of the study is to determine the prevalence and levels of depression, anxiety and post-traumatic stress among doctors and nurses at a regional hospital.

1.4 Objectives of the study

The objectives for the study were formulated as follow:

Objective 1 – To describe depression, anxiety and post-traumatic stress among doctors and nurses at a regional hospital in the Free State Province.

Objective 2 – To determine the relationship between age, experience and depression, anxiety and post-traumatic stress among doctors and nurses at a regional hospital in the Free State Province.

Objective 3 – To determine differences between the depression, anxiety and post-traumatic stress of gender groups and different categories of health workers (nurses and doctors) at the regional hospital in the Free State Province.

1.5 Significance of the study

The outcomes of this study are poised to enhance our comprehension of the repercussions of the Covid-19 pandemic on the mental well-being of frontline healthcare professionals, specifically in terms of depression, anxiety, and post-traumatic stress. These findings will furnish policy makers and healthcare facility administrators with empirically grounded insights that can assist in shaping employee wellness initiatives tailored to the needs of healthcare workers in state hospitals. Moreover, this research will contribute to the existing body of knowledge pertaining to the psychological impact of the pandemic, particularly within a context that has been underrepresented in the literature, namely the African and South African setting. This study lays the groundwork for subsequent research endeavours, facilitating regional and global comparisons on the subject matter.

1.6 Working definitions

The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), published by the American Psychiatric Association in 2013, is a globally recognized resource that provides standardized definitions, classifications, and diagnostic criteria for common psychiatric illnesses. These DSM-5 criteria have been adopted in the present study.

Depression, as defined by the DSM-5, encompasses a persistent depressed mood and a diminished or complete loss of interest or pleasure in most activities. It is often accompanied by changes in appetite, either increased or decreased, as well as cognitive manifestations such as slowed thinking, difficulty concentrating, indecisiveness, reduced energy, and decreased physical activity. Individuals experiencing depression may also have feelings of worthlessness, excessive guilt, and thoughts of death or suicidal ideation. These symptoms are typically present on a daily basis for a continuous period of at least two weeks. Notably, healthcare workers,

particularly nurses in Wuhan, China, reported a depression rate of 50.4%, while clinical levels of depression were documented at 26.8% in an Italian hospital (Rossi et al., 2020).

Anxiety, according to the DSM-5, involves an apprehensive anticipation of future concerns and is often associated with muscle tension and avoidance behavior. A diagnosis of anxiety disorder is made when fear or anxiety significantly disrupts normal functioning and is disproportionately intense in relation to the situation or an individual's age. Notably, health workers in China reported an anxiety rate of 44.6%, and in Italian healthcare workers, the rate was 31.3% (Rossi et al., 2020).

Post-traumatic stress disorder (PTSD) occurs when an individual has been exposed to death, the threat of death, actual or threatened serious injury, or actual or threatened sexual violence directly, indirectly, or through witnessing, learning that a close relative or friend experienced such trauma. Affected individuals often re-experience the traumatic event through nightmares or flashbacks and tend to avoid stimuli associated with the trauma. Additionally, they may struggle to recall details of the traumatic event, experience exaggerated self-blame or blame others for the trauma, and have negative thoughts about themselves and the world. Furthermore, trauma-related arousal and reactivity may manifest as aggression, irritability, risky behaviour, hypervigilance, and insomnia. For a diagnosis of PTSD to be made, these symptoms must cause significant distress and functional impairment for a minimum duration of one month. Notably, 36.7% of healthcare workers in an Italian hospital reported symptoms indicative of post-traumatic stress (Rossi et al., 2020).

1.7. Limitations of the study

The chosen research design, a quantitative cross-sectional approach, offers valuable insights into the mental health status of the study cohort. However, it is essential to acknowledge its inherent limitations, which impact the extent to which inferences can be drawn from the findings. These limitations include:

- **Snapshot Nature:** The cross-sectional approach provides a snapshot of the mental health problems within the study cohort at a specific point in time. This design is not suited to capturing the dynamic nature of mental health conditions, potentially missing fluctuations or changes over time. As a result, it may not distinguish between new-onset mental health conditions triggered by the pandemic and the exacerbation of pre-existing conditions.
- **Lack of Temporal Information:** Since cross-sectional studies do not track individuals over time, they cannot establish causal relationships or determine the temporal sequence of events. Thus, it is challenging to attribute observed mental health issues directly to the pandemic without a longitudinal perspective.
- **Screening Tools:** While the study employs validated screening tools for assessing mental health, these tools may have limitations. They are typically designed to capture common symptoms of anxiety, depression, and post-traumatic stress but may not capture atypical or nuanced symptoms that could be relevant in the context of the pandemic. This might result in an underestimation of the true prevalence of these conditions.

To address these limitations and gain a more comprehensive understanding of the mental health impact of the Covid-19 pandemic, future research could consider incorporating longitudinal designs, more comprehensive assessment tools, and a qualitative component to capture individuals' experiences and perceptions. This multifaceted approach could provide a more nuanced and holistic view of the psychological effects of the pandemic on healthcare workers and help inform interventions and support mechanisms more effectively.

1.8. Chapter outline

Chapter 1: Introduction

In this introductory chapter, the research sets its foundations by providing the context and rationale for the study. It outlines the background that led to the research,

discussing the arguments that justify its significance. The chapter articulates a clear problem statement, delineating the specific gap in knowledge that this research endeavours to address. Furthermore, the aims and objectives of the study are outlined, providing a roadmap for the research's goals and purpose. To ensure clarity, working definitions of key terms or concepts relevant to the study are provided. Additionally, the chapter acknowledges and delineates the constraints and limitations that the research may encounter in its pursuit of understanding the mental health impact of the Covid-19 pandemic on healthcare workers.

Chapter 2: Literature Review

In this chapter, the research delves into the existing body of knowledge surrounding the research topic. It begins by elucidating the conceptual framework of the topic, particularly focusing on the definitions and theoretical underpinnings of depression, anxiety, and post-traumatic stress. The review primarily concentrates on the relevant research concerning frontline medical providers during the Covid-19 pandemic. It compiles and discusses the available literature, presenting insights into how the pandemic has affected the mental health of healthcare workers, thereby providing a comprehensive understanding of the topic's current state of research.

Chapter 3: Methodology

The methodology chapter provides an overview of the research methods employed in the study. It clearly delineates the quantitative research approach adopted, elucidating why this approach was chosen. The chapter also expounds on the research design, detailing the utilization of the cross-sectional design as the chosen method for data collection. In addition, the chapter meticulously describes the research population, the method employed for sample selection, data collection techniques, data analysis procedures, and ethical considerations to ensure the research's integrity and reliability.

Chapter 4: Results

In this chapter, the research presents the empirical findings obtained through the study. It succinctly communicates the prevalence rates of depression, anxiety, and post-traumatic stress among the participants. Furthermore, the chapter elucidates any observed correlations and group differences pertaining to these mental health conditions. To facilitate comprehension, the results are presented in tables, figures, or other relevant visual aids.

Chapter 5: Discussion

The discussion chapter provides an in-depth analysis and interpretation of the research findings in light of the study's objectives. It explores the implications of the results, shedding light on their practical significance and potential applications. The chapter synthesizes the findings, drawing overarching conclusions from the data and the analysis, thereby contributing to the broader understanding of the research topic.

1.9. Conclusion

This chapter establishes the context and background of the study while also elucidating the motivation behind its pursuit. The objectives are explicated to precisely align with the study's overarching aim, and working definitions are precisely formulated to enhance clarity and mutual understanding. The subsequent chapter will offer a comprehensive review of the existing literature pertaining to the research topic.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

In this chapter, a thorough and in-depth review of current, peer-reviewed literature has been conducted. It encompasses a comprehensive overview of key research findings and identifies existing gaps in knowledge related to the impact of Covid-19 on healthcare workers. This chapter serves as a synthesized summary of the pertinent literature on this subject.

2.2 Mental Health

Mental health has been a major concern during the covid-19 period, specifically for frontline workers during the height of the pandemic and a significant part of their global mental health action plan 2013 - 2030 (WHO, 2021).

2.2.1 Definition

According to the World Health Organization (WHO, 2020), mental health is characterized as a state of mental well-being that enables individuals to effectively cope with life's stresses, realize their abilities, engage in productive learning and work, and make positive contributions to their communities. It encompasses cognitive, behavioral, and emotional well-being, essentially referring to how individuals think, feel, and behave (WHO, 2020). In some contexts, "mental health" is colloquially used to imply the absence of a mental disorder (WHO, 2020). However, it's essential to acknowledge that mental health conditions are often referred to as mental disorders, a terminology utilized in this study (WHO, 2020). These conditions can significantly impact an individual's daily life, relationships, and physical well-being. It's crucial to recognize that maintaining good mental health involves a delicate balance of various factors, with several elements contributing to the development of mental disorders (WHO, 2020).

Many mental health professionals rely on the American Psychiatric Association's (APA) Diagnostic and Statistical Manual of Mental Disorders (DSM-5) (APA, 2013) for diagnostic purposes (Cree, Okoro, Zack, & Carbone, 2020). This manual provides detailed descriptions and specific criteria that must be met to qualify for a particular diagnosis (Cree, Okoro, Zack, & Carbone, 2020). In the year 2020, it was estimated that approximately 14.2 million adults in the United States, or roughly 5.6% of the population, experienced a serious psychological condition, as reported by the National Institute of Mental Health (NIMH) (Cree, Okoro, Zack, & Carbone, 2020). Importantly, mental health disorders do not discriminate based on factors such as age, gender, income, or ethnicity, and everyone is susceptible to their development. In both the United States and many other developed nations, mental disorders rank among the leading causes of disability (Cree, Okoro, Zack, & Carbone, 2020).

2.2.2 Theories

Miller (2019) elucidates that the field of mental health encompasses various theoretical perspectives, all of which can be traced back to one of five distinct schools of thought. These schools include behaviorism, biological, psychodynamic, cognitive, and humanistic theories. These theories collectively endeavor to provide insights into human development from behavioral, psychological, and social dimensions (Miller, 2019).

Historically, the primary focus of researchers and practitioners in the field of mental health had been directed towards the amelioration of pain and the alleviation of suffering (Miller, 2019). This approach was predominantly centered on identifying what was perceived as problematic within an individual, devising strategies for rectifying these issues, and did not inherently presume that individuals could actively enhance their own well-being (Miller, 2019).

2.2.2.1 Behaviourism

Behaviorism, as elucidated by Clark (2018), is a psychological perspective that posits that behavior is primarily shaped by life experiences rather than being driven by

unconscious processes of the mind. According to this theory, individuals learn and adapt to their surroundings through interactions and experiences with their environment. The behaviorist approach places significant emphasis on the concept of conditioning, a concept originally conceptualized by B.F. Skinner, as cited by Clark (2018). Conditioning plays a pivotal role in understanding how individuals acquire new behaviors and respond to stimuli in their environment within the framework of behaviorism.

2.2.2.2 Biological

The medical model of treating mental disorders, as described by McLeod (2018), is rooted in the belief that the underlying cause of mental illness is something physical within the individual. This model posits that mental illness is akin to other medical conditions, such as physical diseases, and its symptoms are considered as "outward signs of the inner physical disorder" (McLeod, 2018). In essence, the medical model of mental health focuses on diagnosing and treating mental disorders in a manner similar to how physical illnesses are addressed within the medical field, emphasizing the biological and physiological aspects of mental health.

2.2.2.3 Psychodynamic

Psychodynamic approaches, as outlined by Mitchell and Black (2016), offer a distinct perspective on behavior, emphasizing that behavior is influenced by past experiences. However, a key distinguishing feature of these approaches is their primary focus on past experiences, particularly those that have left lasting impressions on an individual's psyche. Freud, as cited by Mitchell and Black (2016), made significant contributions to the development of psychodynamic theory. He posited that unconscious forces play a pivotal role in driving human behavior (Mitchell & Black, 2016). In essence, psychodynamic approaches delve into the hidden realms of the mind, exploring the influence of past experiences and unconscious motives on an individual's present behavior and psychological well-being.

2.2.2.4 Cognitive

The theory highlighted here places a strong emphasis on thinking rather than actions, as expounded by Mitchell and Black (2016). It elucidates the presence of a feedback loop in which an individual's assumptions and attitudes are intricately connected to their resulting perceptions, which, in turn, inform the conclusions they draw from these perceptions (Mitchell & Black, 2016). Therapists grounded in this approach work collaboratively with individuals to facilitate changes in their thought patterns. It is through these cognitive shifts that individuals can experience changes in their emotions and subsequent behavioral responses (Mitchell & Black, 2016). In essence, this theory underscores the crucial role that thoughts play in influencing both emotions and behaviors.

2.2.2.5 Humanistic

Three distinct therapeutic approaches, as outlined by Mitchell and Black (2016), offer individuals the opportunity to attain their highest potential.

- **Client-Centered Therapy:** Developed by Carl Rogers, this therapeutic approach is centered around empowering clients to explore their core selves. Therapists create an environment characterized by empathy, acceptance, and genuineness, fostering an atmosphere of self-exploration for clients (Mitchell & Black, 2016).
- **Gestalt Therapy:** Founded by Frederick Perls, Gestalt Therapy focuses on the present moment and encourages individuals to engage in role-playing and experiential exercises. It emphasizes awareness of current thoughts, feelings, and behaviors (Mitchell & Black, 2016).
- **Existential Therapy:** This therapeutic approach is characterized by techniques that revolve around the concept of taking full ownership of one's life, including all its ups and downs. Individuals are encouraged to embrace personal responsibility for their life choices and experiences (Mitchell & Black, 2016). In existential therapy, the notion of personal responsibility for one's life is paramount.

These therapies offer distinct pathways for individuals to explore and understand themselves, enhance self-awareness, and work towards realizing their full potential. Each approach has its unique principles and methods to facilitate personal growth and self-actualization.

2.2.3 Mental health problems

There are various mental health problems, of which depression, anxiety and post-traumatic stress are included in this study.

2.2.3.1 Depression

Depression is distinguishable from typical mood fluctuations and transient emotional responses to life's everyday challenges (Anxiety and Depression Association of America, ADAA, 2022). During a depressive episode, an individual consistently experiences a pervasive sense of depressed mood, marked by feelings of sadness, irritability, and emotional emptiness. Furthermore, there is a notable loss of pleasure or interest in previously enjoyable activities, which persists for the majority of the day, nearly every day, spanning a minimum duration of two weeks (Anxiety and Depression Association of America, ADAA, 2022).

In addition to these core symptoms, depression often presents with a constellation of associated manifestations. These may encompass difficulties in concentration, an overwhelming sense of guilt or diminished self-worth, a pervasive feeling of hopelessness regarding the future, contemplation of death or suicide, disruptions in sleep patterns, alterations in appetite or weight, and a persistent sense of fatigue or diminished energy levels (Anxiety and Depression Association of America, ADAA, 2022). Notably, individuals grappling with depression face an elevated risk of suicide (Anxiety and Depression Association of America, ADAA, 2022).

Despite the profound impact of depression, it's essential to recognize that effective psychological treatments are available. The choice of intervention may vary based on factors such as the individual's age and the severity of their condition, with medication being considered as an option in some cases (Anxiety and Depression Association of America, ADAA, 2022). It's also crucial to acknowledge the global prevalence of depression, with an estimated 280 million people living with this condition in 2019, encompassing individuals of all ages, including approximately 23 million children and adolescents (Anxiety and Depression Association of America, ADAA, 2022).

2.2.3.2 Anxiety

As reported by the Anxiety and Depression Association of America (ADAA, 2022), anxiety disorders stand out as the most prevalent mental health condition. These disorders are typified by excessive fear and persistent worry, often accompanied by behavioral disturbances that result in significant distress or impairment in an individual's functioning (ADAA, 2022). Within the spectrum of anxiety disorders, there exists a variety of distinct subtypes, each characterized by its unique features. These include:

- Generalized Anxiety Disorder: This is marked by persistent and excessive worry about various aspects of life.
- Panic Disorder: Characterized by recurrent and debilitating panic attacks, which are intense episodes of fear accompanied by physical symptoms.
- Social Anxiety Disorder: Individuals with this condition experience overwhelming fear and apprehension in social situations, particularly those involving interactions with others.
- Separation Anxiety Disorder: Typically observed in children, this disorder entails excessive anxiety or fear regarding separation from individuals with whom the person shares deep emotional bonds.

It's important to recognize that effective psychological treatments are available for anxiety disorders, and in some cases, medication may also be considered, depending

on factors such as age and severity (ADAA, 2022). The impact of anxiety disorders is substantial, with an estimated 301 million people living with such conditions in 2019, including approximately 58 million children and adolescents (ADAA, 2022). This underscores the widespread prevalence and significance of anxiety disorders as a global mental health concern.

2.2.3.3 Post traumatic stress

Post-Traumatic Stress Disorder (PTSD) can develop in the aftermath of exposure to profoundly distressing or traumatic events, as outlined by the Anxiety and Depression Association of America (ADAA, 2022). This condition is characterized by a constellation of symptoms, including:

- **Re-experiencing the Trauma:** Individuals with PTSD may have intrusive memories, flashbacks, or nightmares, wherein they vividly relive the traumatic event(s).
- **Avoidance:** Those affected may go to great lengths to avoid thoughts, memories, situations, or individuals that remind them of the traumatic event(s).
- **Heightened Perceptions of Threat:** People with PTSD often exhibit persistent feelings of heightened alertness and perceive their surroundings as being fraught with potential threats.

Importantly, these symptoms endure for a duration of at least several weeks and engender significant impairment in an individual's overall functioning. Nevertheless, it is noteworthy that effective psychological treatments are available for individuals grappling with PTSD (ADAA, 2022). This underlines the importance of early intervention and support for those impacted by traumatic experiences.

2.2.4 Mental health of doctors and nurses

The emergence of the coronavirus disease of 2019 (Covid-19) has brought about irreversible transformations in global health, economic activities, and social

interactions (Xiong et al., 2020; Talevi et al., 2020; Horesh and Brown, 2020; Rossi et al., 2020; Kathirvel, 2020). The Covid-19 pandemic's psychological impact, while extensively discussed in the literature, remains incompletely quantified and is likely to exacerbate the pre-existing burden of mental health issues within the general population (Xiong et al., 2020; Talevi et al., 2020; Horesh and Brown, 2020; Rossi et al., 2020; Kathirvel, 2020). The global state of heightened stress and anxiety has been significantly influenced by several factors, including the virus's high transmission rates, its rapid progression in vulnerable populations, and the absence of an effective cure or vaccine (Xiong et al., 2020; Horesh and Brown, 2020; Lee, 2020; Kathirvel, 2020). Notably, some countries have reported a Covid-19 mortality rate of up to 10%, with health workers being particularly affected, as approximately 20% have faced the direct impact of the virus (Sher, 2020; Giusti et al., 2020).

Covid-19 was initially identified as an atypical pneumonia outbreak in Wuhan, China, in 2019, with the causative agent subsequently identified as the novel coronavirus strain, SARS-CoV-2, which rapidly spread globally (Talevi et al., 2020). In response to the escalating crisis, the World Health Organization (WHO) officially declared the Covid-19 outbreak a global pandemic on March 11, 2020 (Talevi et al., 2020; Horesh and Brown, 2020). In an effort to contain the virus's transmission, numerous countries, including South Africa, implemented national lockdowns, with South Africa enacting strict measures on March 27, 2020 (The Presidency, Republic of South Africa, 2020). This decision aimed to curtail Covid-19 community transmission and alleviate the strain on an already overburdened healthcare system (The Presidency, Republic of South Africa, 2020).

Healthcare workers, particularly during pandemics, face distinct challenges in comparison to the general population, including extended working hours and the inability to maintain proper social distancing from patients. Additionally, the availability and comfort of wearing personal protective equipment (PPE) have been inconsistent (Giusti et al., 2020). The unanticipated nature of the pandemic has left healthcare workers feeling disempowered, helpless, and, at times, hopeless (Giusti et al., 2020). Such prevailing conditions within the healthcare sector can contribute to burnout and

potentially exacerbate psychiatric disorders among these professionals (Giusti et al., 2020).

Notably, healthcare workers in Wuhan, China, reported alarmingly high rates of mental health issues, including a depression rate of 50.4%, an anxiety rate of up to 44.6%, and a stress rate of up to 71.5%. Furthermore, insomnia and posttraumatic stress have become distressingly common, affecting 34% and 73.4% of healthcare workers, respectively, in the same population. An Italian hospital reported clinical levels of depression and anxiety among healthcare workers at 26.8% and 31.3%, respectively, with 36.7% reporting symptoms of posttraumatic stress (Rossi et al., 2020).

2.2.5 Mental Health during covid-19

The global outbreak of the coronavirus disease of 2019 (Covid-19) has had profoundly adverse effects on various sectors of the economy and has rapidly depleted the resources of many nations (Xiong et al., 2020; Talevi et al., 2020; Horesh and Brown, 2020; Rossi et al., 2020; Kathirvel, 2020). The widespread loss of jobs and the ever-evolving understanding of the Covid-19 disease process have instilled fear, stress, and uncertainty across all segments of the general population (Horesh and Brown, 2020). Notably, healthcare workers, often referred to as front-liners, have been found to experience higher levels of fear and stress in comparison to the general population (Sher, 2020; Giusti et al., 2020). The psychological stress associated with Covid-19 is anticipated to trigger and exacerbate mental health issues, particularly in high-risk groups (Sher, 2020; Mazza et al., 2020; Giusti et al., 2020). For example, in Canada, it is projected that suicidal ideation resulting from joblessness will increase fivefold during the pandemic (Xiong et al., 2020), with similar trends expected in the United States, India, Pakistan, France, Germany, and Italy (Xiong et al., 2020).

A comprehensive systematic review involving 93,569 participants revealed a maximum prevalence of anxiety symptoms at 50.9%, stress symptoms at 81.9%, and post-traumatic stress symptoms at 53.8%, encompassing both developed and developing countries (Xiong et al., 2020). Vulnerable individuals identified in this

context include those aged 40 or younger, females, individuals with pre-existing psychiatric illnesses or comorbidities, the unemployed, students, healthcare workers, and those with frequent exposure to Covid-19 news (Xiong et al., 2020; Horesh and Brown, 2020). Within a Chinese cohort, 35.1% were affected by generalized anxiety disorder, 20.1% exhibited depressive symptoms, and 18.2% displayed abnormal sleep patterns (Xiong et al., 2020), with healthcare professionals experiencing more pronounced abnormal sleep patterns (Xiong et al., 2020).

Horesh and Brown (2020) have advocated for a broader conceptualization of the term "stress" in the current psychological discourse surrounding Covid-19, emphasizing its potential to result in posttraumatic stress. This viewpoint is substantiated by a survey of Covid-19 survivors, in which a striking 96.2% exhibited posttraumatic stress symptoms (Forte et al., 2020; Kaseda and Levine, 2020). Post-Traumatic Stress Disorder (PTSD), considered the second most prevalent psychiatric disorder after depression (Forte et al., 2020; Kaseda and Levine, 2020), affects 10% of individuals who have experienced a traumatic event during their lifetime, as defined by the Diagnostic Manual for Mental Disorders, 5th edition (DSM-5) (Forte et al., 2020; Kaseda and Levine, 2020). Alarming, following the 2003 SARS epidemic in Hong Kong, 50% of individuals displaying anxiety symptoms went on to develop anxiety disorders (Kaseda and Levine, 2020).

Notably, Covid-19 has been associated with neurological symptoms in 25% of affected individuals, and this group has exhibited a higher suicide rate compared to the general population (Sher, 2020). In the United States of America (USA), it has been reported that 90% of suicide cases are accompanied by psychiatric comorbidities, with major depression being comorbid in 60% of these instances (Sher, 2020). Among healthcare workers, the highest suicide rates were observed among anaesthesiologists and psychiatrists in an American cohort (Davis et al., 2003). However, it is important to note that current data on suicide rates among health workers during the Covid-19 pandemic are lacking.

2.2.6 The effects of covid-19 on the mental health of doctors and nurses

Global reports on the effect of covid-19 on the mental health of frontline workers emerged, from Asian, European, American and African countries alike. These are discussed below.

2.2.6.1 Asia

2.2.6.1.1 China

In Wuhan, the epicenter where COVID-19 was initially isolated, a cross-sectional study involving healthcare workers (n = 1257) revealed a prevalence of various mental health symptoms, including depression (50.4%), anxiety (44.6%), insomnia (34%), and distress (72%) (Mascayano et al., 2022). Another comprehensive national study conducted in China (n = 2182) compared healthcare workers, comprising doctors and nurses (n = 927), with non-medical employees of healthcare facilities (n = 1255). This study identified significantly higher levels of depression and anxiety among healthcare workers (Zhang et al., 2020). Furthermore, the research highlighted that female healthcare workers with underlying organic health conditions faced an elevated risk of experiencing symptoms of depression and anxiety (Zhang et al., 2020).

Additionally, when comparing the prevalence rates of anxiety, depression, and insomnia symptoms between medical and non-medical staff in the aforementioned study, the results were as follows: anxiety (13% versus 8.5%), depression (12.2% versus 9.5%), and insomnia (38.4% versus 30.5%), respectively (W. R. Zhang et al., 2020).

2.2.6.1.2 Nepal

A web-based cross-sectional survey conducted in Nepal involved 427 healthcare workers, comprising doctors, nurses, paramedics, laboratory staff, pharmacists, and public health specialists (Khanal et al., 2020). The study's findings indicated that healthcare workers with underlying medical conditions were more likely to report symptoms of anxiety, depression, and insomnia, as assessed using the 14-item

Hospital Anxiety and Depression Scale (HADS) and insomnia, as evaluated with the 7-item Insomnia Severity Index (Khanal et al., 2020). In this study, it was observed that 41.9% of participants exhibited symptoms of anxiety, 37.5% reported symptoms of depression, and 33.9% experienced symptoms of insomnia (Khanal et al., 2020).

2.2.6.1.3 India and Saudi Arabia

In an Indian cross-sectional study involving healthcare workers who were actively treating COVID-19 patients during the pandemic, a high prevalence of mental health symptoms was observed. Specifically, among the 197 participants, 92.4% reported symptoms of depression, and 98.5% reported symptoms of anxiety (Suryavanshi et al., 2020).

Conversely, in a Saudi Arabian cohort comprising 507 respondents, a lower but still significant proportion reported mental health symptoms. Specifically, 55.2% of the participants reported depressive symptoms as measured by the Patient Health Questionnaire (PHQ-9), and 51.4% reported anxiety symptoms assessed using the Generalised Anxiety Disorder (GAD-7) scale (AlAteeq et al., 2020). Furthermore, the Saudi Arabian study revealed that female nurses between the ages of 30 and 39 years were at a higher risk of developing both depressive and anxiety symptoms (AlAteeq et al., 2020).

2.2.6.2 Europe

2.2.6.2.1 Italy

Italy was among the earliest European countries to face a significant surge of COVID-19 cases, which led to the overwhelming of its healthcare system and healthcare workers. In 2020, a cross-sectional survey was conducted among 145 healthcare workers, consisting of 72 medical doctors and 73 nurses, aiming to assess the presence of symptoms related to anxiety (State-Trait Anxiety Inventory-Form Y1 –

STAI Y1), depression (Beck Depression Inventory (BDI-II)), and posttraumatic stress (PCL-5) (Tella et al., 2020a). The findings of this study revealed noteworthy results. Specifically, it was observed that single women in the study faced a heightened risk of developing depressive symptoms and clinically significant symptoms of posttraumatic stress as assessed by the PCL-5 (Tella et al., 2020b).

2.2.6.2.2 Poland

A cross-sectional survey conducted across six hospitals in Poland aimed to compare the mental health of healthcare workers in frontline roles, who were actively working in COVID-19 wards, with that of other hospital employees (referred to as second-line workers) (Wańkiewicz et al., 2020). The study findings indicated a significant prevalence of mental health symptoms among the overall study population, with 64% experiencing symptoms of anxiety, 70.7% reporting depressive symptoms, and 58% reporting symptoms of insomnia (Wańkiewicz et al., 2020).

Furthermore, a sub-analysis within the study revealed substantial disparities between frontline and second-line workers. Specifically, frontline workers exhibited a notably higher prevalence of mental health symptoms, with rates of 99% for anxiety symptoms, 99.5% for depressive symptoms, and 100% for symptoms of insomnia, as compared to 34.04%, 45.53%, and 21.7% among second-line workers, respectively (Wańkiewicz et al., 2020). Additionally, the study uncovered that individuals with chronic conditions such as hypertension, diabetes mellitus, asthma, autoimmune diseases, and those who smoked cigarettes were at an increased risk of reporting clinically significant scores on the screening tools for anxiety (GAD-7), depression (PHQ), and insomnia (ISI) (Wańkiewicz et al., 2020).

Hummel (2021) reported elevated levels of stress (Table 2.1), depression (Table 2.2), and anxiety (Table 2.3) among various European countries.

Table 2.1. Stress levels in different European countries assessed using the Depression Anxiety Stress Scales – 21[as published by (Hummel et al., 2021)]

Country	Mean (SD)	Normal/mild, n (%)	Moderate, n (%)	Severe/very severe, n (%)
Germany	17.13 (9.94)	76 (55.88)	27 (19.85)	33 (24.27)
Austria	14.10 (7.96)	17 (80.95)	1 (4.76)	3 (14.29)
Switzerland	11.40 (11.29)	32 (80.00)	2 (5.00)	6 (15.00)
France	21.77 (12.24)	25 (48.08)	4 (7.69)	23 (44.23)
Italy	17.25 (10.46)	91 (57.23)	27 (16.98)	41 (25.79)
Spain	16.42 (10.45)	62 (62.63)	13 (13.13)	24 (24.24)
Portugal	20.78 (10.95)	24 (52.17)	3 (6.52)	19 (41.30)
United Kingdom	18.86 (10.13)	29 (51.79)	10 (17.86)	17 (30.36)
Total	17.40 (10.71)	356 (58.46)	87 (14.29)	166 (27.26)

Table 2.2. Depression levels in different European countries assessed using the Depression Anxiety Stress Scales – 21[as published by (Hummel et al., 2021)]

Country	Mean (SD) ^a	Normal/mild, n (%)	Moderate, n (%)	Severe/very severe, n (%)
Germany	11.49 (8.91)	87 (63.97)	28 (20.59)	21 (15.44)
Austria	7.33 (8.23)	17 (80.95)	3 (14.29)	1 (4.76)
Switzerland	7.45 (8.68)	31 (77.50)	6 (15.00)	3 (7.50)
France	17.42 (11.63)	22 (42.31)	11 (21.15)	19 (36.54)
Italy	10.03 (9.30)	119 (74.84)	19 (11.95)	21 (13.21)
Spain	8.51 (8.98)	75 (75.76)	14 (14.14)	10 (10.10)
Portugal	12.26 (8.46)	24 (52.17)	14 (30.44)	8 (17.39)
United Kingdom	17.64 (11.04)	21 (37.50)	13 (23.21)	22 (39.29)
Total	11.34 (9.90)	396 (65.02)	108 (17.73)	105 (17.24)

Table 2.3. Anxiety levels in different European countries assessed using the Depression Anxiety Stress Scales – 21 [as published by (Hummel et al., 2021)]

Country	Mean (SD)	Normal/mild, n (%)	Moderate, n (%)	Severe/very severe, n (%)
Germany	8.44 (7.94)	85 (62.50)	19 (13.97)	32 (23.53)
Austria	4.86 (5.68)	15 (71.43)	5 (23.81)	1 (4.76)
Switzerland	4.10 (6.13)	34 (85.00)	3 (7.50)	3 (7.50)
France	11.39 (10.53)	27 (51.92)	10 (19.23)	15 (28.85)
Italy	7.64 (8.39)	110 (69.18)	25 (15.72)	24 (15.09)
Spain	10.04 (10.54)	60 (60.61)	12 (12.12)	27 (27.27)
Portugal	9.83 (8.59)	23 (50.00)	11 (23.91)	12 (26.09)
United Kingdom	10.36 (9.69)	32 (57.14)	6 (10.71)	18 (32.14)
Total	8.61 (9.00)	386 (63.38)	91 (14.94)	132 (21.67)

2.2.6.3. Africa

2.2.6.3.1 Togo

In a study conducted in Togo, a cohort of 62 healthcare workers participated, and the results revealed a significant prevalence of mental health symptoms. Specifically, among the participants, 62.9% reported symptoms of anxiety, and 51.6% reported symptoms of depression (Kounou et al., 2020). These symptoms were assessed using validated questionnaires, namely the GAD-7 for anxiety and the PHQ-9 for depression (Kounou et al., 2020). Furthermore, the study identified specific risk factors associated with mental health symptoms among Togolese healthcare workers. It was noted that female health workers with a diagnosis of hypertension and/or diabetes were at an elevated risk of reporting symptoms of anxiety and depression (Kounou et al., 2020).

2.2.6.3.2 Kenya

In East Africa, a study was conducted among a cohort of 433 Kenyan healthcare workers, with a majority of them working as frontline personnel (68.8%). The study revealed a substantial burden of mental health challenges within this population. Specifically, the rates of depression, anxiety, insomnia, distress, and burnout were reported as 53.6%, 44.3%, 41.1%, 31%, and 45.8%, respectively (Shah et al., 2021). Furthermore, the study found that female doctors in this cohort faced a heightened risk of experiencing severe symptoms of depression and anxiety (Shah et al., 2021).

2.2.6.3.3 Sub-Saharan Africa (Burkina Faso, Ethiopia, Tanzania, Nigeria and Ghana)

In a comprehensive study involving a total of 1499 participants from five sub-Saharan African countries (Burkina Faso, Ethiopia, Tanzania, Nigeria, and Ghana), the research findings unveiled the prevalence of various mental health challenges among healthcare workers. The overall results indicated that 14.7% of participants reported experiencing psychological distress, with 7.8% reporting severe depressive symptoms and 6% experiencing severe anxiety symptoms (Assefa et al., 2022). Among the

countries involved in the study, Ghana stood out with the highest number of healthcare workers who reported high anxiety and depression scores (Assefa et al., 2022).

2.2.6.3.4 South Africa

In a cohort consisting of 122 participants at a Tertiary Hospital in Pretoria, South Africa, the study revealed that a significant proportion of healthcare workers, specifically 57.4%, exhibited a high degree of psychological stress symptoms as assessed by the General Health Questionnaire (GHQ-12 questionnaire) (Lee et al., 2022). Similarly, in another study involving 286 nursing staff in the Free State province of South Africa, 44% of participants screened positive for post-traumatic stress symptoms, as determined by the Impact of Events Scale-Revised (IES-R) screening tool (Engelbrecht et al., 2021).

Furthermore, in the province of Gauteng at the University of the Witwatersrand, South Africa, a wide range of clinically significant high screening scores for depression, anxiety, and posttraumatic stress symptoms were reported, with rates ranging from 8.9% to 50.4%, 10.4% to 44.6%, and 32% to 71.5%, respectively (Engelbrecht et al., 2021). In the KwaZulu-Natal Province of South Africa, a study comprising predominantly doctors (72.3%) among 312 participants revealed the following prevalence rates of mental health symptoms: depressive symptoms at 51.5%, anxiety symptoms at 47.2%, and stress symptoms at 44.3% (Dawood et al., 2022). Notably, within the same cohort, a proportion of participants exhibited severe symptoms, with 16.2% scoring in the severe range for depression, 21.3% for anxiety, and 16.2% for stress symptoms (Dawood et al., 2022). In addition, Zhang & Chen (2021) reported on elevated levels of depression and anxiety across various African countries, providing further insight into the mental health challenges faced by healthcare workers in the region (see Table 2.4).

2.3. Close

This chapter provided definitions and theoretical approaches to the study of mental health and reported on available literature on the prevalence of depression, anxiety and post-traumatic stress on frontline workers during covid-19 pandemic.

Table 2.4. Existing meta-analytical evidence on the prevalence rates of key mental health symptoms in several regions [as published by Zhang & Chen (2021)]

Region/country	# of studies	# of countries	# of participant	All adult pop. inclusive				General population				General HCWs				Frontline HCWs			
				ANX	DEP	INS	DIS	ANX	DEP	INS	DIS	ANX	DEP	INS	DIS	ANX	DEP	INS	DIS
Africa (Chen et al., <i>In Press</i>)	28	12/54	15,072	37%	45%	28%		37%	42%	27%		35%	43%	28%		51%	55%	30%	
-Egypt (El-Qushayri et al., 2021)*	10	1/1	3,137									72%	66%	58%	67%				
Asia (Norhayati MY & Azman, 2021)	80	18/48	149,925									35%	35%	41%	32%	24%	33%	49%	41%
-South Asia(Hossain et al., 2021)**	35	5/8	41,402	41%	34%			41%	39%			44%	30%						
-Southeast Asia (Pappa et al., <i>in press</i>)	32	6/11	20,352	22%	16%	19%		31%	16%			18%	15%			32%	14%		
-China (Chen et al., 2021)***	131	1/1	630,244	11%	13%	19%	20%	15%	16%	20%	25%	14%	15%	18%	29%	19%	20%	24%	29%
-India (Singh et al., 2021)	22	1/1	9,947	34%	33%	27%	43%												
Eastern Europe (Zhang et al., 2021)	21	10/21	21,918	30%	27%			22%	20%			33%	34%			46%	34%		
Latin America (Zhang et al., 2021)	33	10/33	101,772	32%	32%	35%	32%	33%	33%		33%	30%	31%	30%	30%	23%	37%		
Spain (Chen et al., 2021)	28	1/1	86,336	20%	22%			17%	20%							46%	33%		

ANX = Anxiety, DEP = Depression, INS = Insomnia, DIS = Distress.

of countries refer to the number of countries that a meta-analysis covered out of the total number of countries in the region.

*Meta-analysis in Egypt studies reported the prevalence rates at the mild above level. Their prevalence rates of anxiety, depression, and distress at the moderate above are 61.9%, 53.0% and 52.3%, respectively.

**The HCWs in the South Asia studies and Egypt studies aggregated both general HCWs and frontline HCWs.

***The meta-analysis in China reported the prevalence rates at the moderate symptom for the three subgroup populations; Meta-analyses in other regions reported the prevalence rates of the overall symptom.

CHAPTER 3

METHODOLOGY

3.1. Introduction

In this chapter, a comprehensive description of the methodology employed in the study is provided. The research utilized a quantitative approach, focusing on the collection and analysis of numerical data. The primary data collection method involved conducting a cross-sectional survey to assess the prevalence of depressive, anxiety, and posttraumatic stress symptoms among the study participants. These mental health symptoms were evaluated using well-validated screening tools designed to provide reliable and standardized measurements. The selection of a cross-sectional design allowed for the examination of the mental health status of the participants at a single point in time, providing valuable insights into the prevalence of these symptoms within the target population. This methodological approach ensures the collection of rigorous and objective data, facilitating a robust analysis of the study's research questions and objectives. The following sections will further detail the specific procedures, instruments, and data analysis techniques employed in this research study.

3.2 Quantitative research approach

Quantitative research methods are characterized by their emphasis on objective measurements, statistical analysis, and mathematical techniques to examine data. These methods typically involve the collection of data through polls, questionnaires, surveys, or the manipulation of pre-existing statistical data using computational techniques. The primary goal of quantitative research is to generate generalizable findings or to explain specific phenomena through systematic and numerical analysis of data.

According to Babbie (2010), key features of quantitative research methods include:

- **Objective Measurement:** Quantitative research seeks to obtain data that is objective and measurable. This often involves collecting numerical data, which can be subjected to statistical analysis. The aim is to minimize subjectivity and bias in the data collection process.
- **Statistical Analysis:** Quantitative research relies heavily on statistical analysis to draw conclusions from the collected data. Statistical tests and techniques are used to identify patterns, relationships, and trends within the data. This allows researchers to make inferences about the larger population from which the sample was drawn.
- **Generalizability:** One of the primary objectives of quantitative research is to generalize findings from a sample to a larger population. By using random sampling and statistical methods, researchers aim to make statements that apply beyond the specific group of participants surveyed.
- **Hypothesis Testing:** Quantitative research often involves testing hypotheses or research questions using statistical tests. Researchers formulate specific hypotheses and then use data analysis to determine whether the data support or refute these hypotheses.
- **Large Sample Sizes:** Quantitative studies typically involve larger sample sizes compared to qualitative research. This is because larger samples can enhance the reliability and generalizability of the findings.
- **Structured Data Collection:** Data collection instruments such as surveys and questionnaires are carefully designed to ensure consistency and standardization. This helps in minimizing variations in data collection.
- **Replicability:** Quantitative research is often designed in a way that allows for replication by other researchers. This enhances the credibility and reliability of the findings.
- **Quantitative Variables:** Variables in quantitative research are often numeric and can be measured on scales. These variables may include age, income, test scores, and other quantifiable attributes.

Overall, quantitative research methods are well-suited for investigating relationships, patterns, and trends in data, and they are widely used in various fields, including psychology, sociology, economics, and the natural sciences.

3.3 Cross-sectional research approach

3.3.1 Research design

This cross-sectional quantitative study will employ previously validated questionnaires for the assessment of anxiety, depression, and stress symptoms. These questionnaires will be distributed via participants' hospital email addresses, directing them to an online research platform, SurveyMonkey. The survey will consist of a biographical section and two screening tools for mental health symptoms. Ethical considerations, including informed consent and data privacy, will be addressed. Data analysis methods will be determined as part of the subsequent research process.

3.3.2. Research Population

Boitumelo Regional Hospital comprises a total of 586 employees, categorized into three main groups: clinical staff, allied health practitioners, and non-clinical staff. Among these employees, there are 377 clinical staff members, consisting of 66 doctors and 246 nurses. Additionally, there are 65 allied health practitioners who include dietitians, physiotherapists, occupational therapists, social workers, and psychologists, as well as environmental health practitioners. Lastly, the hospital employs a total of 274 non-clinical staff members who are responsible for various administrative and maintenance-related functions within the hospital.

3.3.2.1 Inclusion criteria

All consenting health care workers that were employed by the Hospital during the study period

3.3.2.2 Exclusion criteria

All the health care workers that did not consent to the study. All the health care-workers that were employed after the Lockdown.

3.3.3. Setting

The Free State is one of the nine provinces of South Africa, located in the central region of the country. Geographically, it is characterized by rural towns, extensive agricultural land, and goldfields. Within this province, there are a total of 32 hospitals, which encompass tertiary, regional, and district healthcare facilities. Among these hospitals, Boitumelo Regional Hospital is situated in the town of Kroonstad, within the Mophaka Municipality, Fezile Dabi District of the Free State Province. Boitumelo Regional Hospital serves as a vital referral center for a network of 39 clinics, 5 community health centers, and 4 district hospitals. This hospital plays a crucial role in providing healthcare services to a diverse and sizable population, as indicated by South African District Health Information System (DHIS) data from 2016, which reports a population of 531,329 within its catchment area.

3.3.4. Sample

Convenience sampling will be the sampling method employed for this study. To recruit participants, communication will be disseminated through multiple channels, including email, institutional WhatsApp groups, and various meetings, with the aim of inviting nurses and doctors to voluntarily take part in the research. While the goal is to achieve a 100% response rate, it is important to note that, according to a sample size calculator (<https://www.surveysystem.com/sscalc.htm>), a sample size of 172 participants may be necessary to ensure that parametric tests can be conducted on the data while maintaining a 95% confidence level ($\alpha = 0.05$). This sample size calculation helps ensure that the study has an adequate number of participants to draw valid and statistically significant conclusions from the data.

3.3.5. Instrument

In this study, an online survey will be administered to collect data from participants. The survey will consist of two main sections: a biographical portion and two validated questionnaires for assessing anxiety, depression, and stress symptoms. The biographical section will capture essential demographic and professional information, including variables such as age, gender, level of education, profession, years of experience, department, and whether the participant has tested positive for COVID-19 at any point. The two validated tests selected for assessing anxiety, depression, and stress symptoms were:

3.3.5.1. The Hospital Anxiety and Depression Scale (HADS)

The Hospital Anxiety and Depression Scale (HADS) is a 14-item questionnaire, divided into two equal sections: HADS-A (anxiety) and HADS-D (depression) (Bjelland et al., 2002; Zigmond and Snaith, 1983; Strydom et al., 2012). Originally developed by Zigmond and Snaith in 1983, this screening tool was initially designed to identify anxiety disorders and depression in patients not afflicted by psychiatric conditions within hospital and clinical settings (Zigmond and Snaith, 1983). Subsequently, it has garnered recognition for its suitability for use within the general population (Djukanovic et al., 2017).

The HADS demonstrates robust discriminatory capabilities between symptoms of anxiety and depression. Across diverse linguistic contexts, it exhibits internal consistency exceeding the recommended Cronbach's coefficient threshold of 0.60 for self-administered questionnaires (Bjelland et al., 2002). Despite its brevity, the HADS has exhibited sensitivity and specificity on par with other commonly employed anxiety and depression assessment instruments, underscoring its efficacy as a concise yet reliable tool for evaluating mental health symptoms (Bjelland et al., 2002).

3.3.5.2. The PCL-5 (US Department of Veteran Affairs. PTSD: National Center for PTSD)

The PCL-5, developed by the US Department of Veteran Affairs and the National Center for PTSD, serves as a valuable checklist for assessing posttraumatic stress disorder (PTSD) according to DSM-5 criteria. This self-report instrument comprises 20 items designed to gauge the presence and severity of PTSD symptoms, with each item corresponding to specific criteria outlined in DSM-5. The PCL-5 serves multiple purposes, including the quantification and tracking of symptoms over time. It is also instrumental in screening individuals for potential PTSD and aiding in the provisional diagnosis of this disorder.

Notably, the PCL-5 is endorsed in the DSM-5, signifying its credibility and utility as a diagnostic tool. Moreover, its validity and reliability have been established for use within the South African context, as evidenced by Makhubela (2018). The PCL-5 demonstrates robust internal consistency and reliability, boasting alpha (α) and test-retest (r) coefficients of 0.94 and 0.82, respectively. Furthermore, it exhibits substantial convergent validity (with correlation coefficients, r_s , ranging from 0.31 to 0.60) and discriminant validity (with r_s ranging from 0.31 to 0.61) as demonstrated by Blevins et al. (2015).

3.3.6. Procedure

The survey questionnaire was hosted on Survey Monkey®, and a unique link was distributed to individual staff and students via their respective email addresses, inviting them to participate in the study. Upon clicking the link, participants were directed to an informed consent form, which they completed online. Following the completion of the informed consent process, participants had the opportunity to proceed with the survey. To ensure that data access and connectivity were not challenges for healthcare professionals, including doctors and nurses at the study site, the link to the questionnaire was made available after obtaining ethics approval. Notably, within the hospital premises, dedicated computers were accessible in every ward, providing

convenient access for staff members to participate in the study. Following the completion of the informed consent process, participants were guided through the survey, which included the biographical questionnaire and the two assessments. Refer to Appendix A-C for the detailed content of these assessments.

3.3.7. Data analysis

In this study, descriptive statistics will be employed to summarize and report findings. Continuous data, such as age, will be described using measures such as means and standard deviations. Categorical data will be presented in terms of frequencies and proportions, offering a clear overview of the distribution of variables. Furthermore, descriptive statistics will be utilized to provide insights into each domain of the HADS and PCL-5 assessments. This will involve calculating scores for scales and sub-scales as per the respective manuals and guidelines for these tests. Categorization of data will align with established norms and norm scores for the assessments.

To assess the reliability of the scales and sub-scales, Cronbach's Alpha will be employed as a measure of internal consistency among the items. A significance level of 0.05 and a 95% Confidence Interval will be utilized for all statistical analyses, ensuring robustness in the findings. To explore relationships between variables, Pearson product-moment correlations will be computed, allowing for the quantification of associations. Additionally, Independent samples t-tests and one-way analysis of variance (ANOVA) will be employed to investigate group differences within the dataset. Associations in the data will be assessed using Chi-Square tests, providing valuable insights into the relationships between categorical variables.

3.3.8 Validity and reliability

The HADS demonstrates excellent discriminative ability in distinguishing between symptoms of anxiety and depression. Its internal consistency, assessed across various linguistic contexts, surpasses the recommended Cronbach's coefficient threshold of 0.60 for self-administered questionnaires (Bjelland et al., 2002). Notably,

despite its brevity, the HADS exhibits sensitivity and specificity that are on par with other commonly used anxiety and depression questionnaires, highlighting its effectiveness as a concise assessment tool (Bjelland et al., 2002).

The PCL-5, endorsed in the DSM-5, has been established as a valid and reliable instrument for use within the South African context (Makhubela, 2018). It boasts robust internal consistency with a Cronbach's alpha (α) of 0.94 and a test-retest reliability coefficient (r) of 0.82 (Blevins et al., 2015). Additionally, the PCL-5 demonstrates substantial convergent validity, with correlation coefficients (r_s) ranging from 0.31 to 0.60, as well as discriminant validity, with coefficients (r_s) ranging from 0.31 to 0.61 (Blevins et al., 2015). These findings underscore the instrument's reliability and validity for assessing posttraumatic stress disorder symptoms.

3.4 Ethical considerations

3.4.1 Permission for the study

An application for ethical clearance was submitted to the Health Research Ethics Committee at the University of Fort Hare. Permission to conduct the research was formally requested from the Hospital management. Furthermore, additional permission was sought from the Free State Department of Health Protocol Review Committee subsequent to obtaining ethical approval from the University.

3.4.2. Informed consent

Participants were requested to sign and complete an informed consent form prior to being granted permission to participate in the study. The participation of doctors and nurses was entirely voluntary, and individuals had the option to withdraw from the study at any point they chose. To provide support and ensure the well-being of participants, those who wished to do so were given the option to provide their contact details. This was done in case a referral to the psychological services division of the Hospital's employee wellness program became necessary.

3.4.3. Confidentiality

The information was handled with strict confidentiality, and participation was kept anonymous to ensure that no personal information was linked to any participant. The participation of doctors and nurses remained entirely voluntary, and individuals had the freedom to withdraw from the study at any point they wished to do so.

3.4.4 Anonymity

The information was handled confidentially, and participation remained anonymous to ensure that no personal information was linked to any participant.

3.4.5. Risk / benefit ration

The study had the potential to cause psychological distress in some participants as it involved the recollection of memories associated with the lockdown. However, it was important to note that this distress could serve as a valuable reflection point, shedding light on the impact of the COVID-19 lockdown on healthcare workers. This, in turn, could serve as a catalyst for seeking expert help and support for the participants who may require it. Additionally, the study had the potential to motivate the employer to tailor and reinforce its employee wellness programs in response to the identified needs and challenges faced by healthcare workers.

3.5 Close

This chapter has presented the methodology employed in the study, which was characterized by a quantitative, cross-sectional design. It included discussions on various key aspects of the research, encompassing the research population, sample selection, data collection methods, data analysis techniques, and ethical considerations that were rigorously adhered to throughout the study.

CHAPTER 4

RESULTS

4.1. Introduction

In this chapter, the results are summarized in terms of descriptive and inferential statistics in order to meet every objective in this study.

4.2. Descriptive Statistics

There was a total of 200 participants who participated in the study.

4.2.1 Age and work experience of the participants

The mean age of the participants was 42.29 years ranging between 23 to 65 years with a mean work experience of 71.79 months at the hospital (see Table 4.1).

Table 4.1. Mean age and work experience of respondents

	N	Minimum	Maximum	Mean	Std. Deviation
Age (years)	199	23	65	42.29	10.82
Work Experience (Months)	200	0	480	71.79	84.19

4.2.2 Gender and ancestry of the participants

The majority of participants were of African descent with a male to female ratio 1:2.3, as presented in Table 4.2.

Table 4.2. Gender and ancestry of the sample

Description	n	%
Gender		
Male	61	30,5
Female	139	69,5
Ancestry		
African	173	86,9
Indian	3	1,5
Coloured	9	4,5
White	14	7,0

4.2.3. Work environment of the participants

The results are presented in Table 4.3. Forty-seven percent of the participants were working in the Maternity, Medical and Surgical ward at the time of the survey. The majority of respondents were employed full-time (98%) at the time of the survey.

Table 4.3: Work environment of the sample.

Description	n	%
Hospital section		
Maternity (high risk area)	30	15
ICU (high risk area)	18	9
Casualty Ward (high risk area)	14	7
Obstetrics and Gynaecology (Intermediate risk)	17	8,5
Theater/Surgery (high risk area)	29	14,5

Administration (low risk)	7	3,5
Pediatrics/Neonatal/Antenatal (Intermediate risk)	21	10,5
Orthopedics (Intermediate risk)	9	4,5
Psychiatry (Intermediate risk)	6	3
Medical Ward (High risk)	35	17,5
Infectious Ward (High risk)	4	2
Covid Ward (High risk)	5	2,5
ARV (low risk)	1	0,5
Anaesthesia (High risk)	2	1
Family Medicine (low risk)	2	1
Rank		
Community service	5	2,5
Medical Officer	22	11,1
Intern doctor	20	10,1
Specialist	9	4,5
Specialist nurse	28	14,1
Professional nurse	55	27,6
Staff nurse	29	14,6
Assistant nurse	25	12,6
Operational manager	5	2,5
Assistant director	1	0,5
Appointment		
Part-Time	4	2

4.2.4 Covid-19 related information

Forty-five percent of the cohort had a positive Covid-19 test during the South African lockdown as presented in Table 4.4. Covid-19 positivity at Boitumelo Regional shows a bi-modal distribution with peaks during the level 5 lockdown in 2020 and level 3 lockdown in 2021.

Table 4.4: Covid-19 related information of the sample

Description	n	%
Covid-19 Positive Test		
Positive	91	45,5
Negative	109	54,5
Contracted Covid-19 during Lockdown level		
2020 Level 5	22	24,7
2020 Level 4	13	14,6
2020 Level 3	12	13,5
2021 Level 3	22	24,7
2021 Level 2	10	11,2
2021 Level 1	10	11,2

4.2.5. Experience of covid-19 pandemic

Participants were asked to indicate how “bothered” they were by the pandemic. The results are presented in Table 4.5. Although a variable number of responses were given, with most (29%) indicating that it bothered them quite a bit.

Table 4.5: Bothered by Covid-19

How much were you bothered by covid-19?	Frequency	Percent
Not at all	37	18.5
A little	54	27.0
Moderately	51	25.5
Quite a bit	58	29.0
Total	200	100.0

4.3 Depression, Anxiety and Post-traumatic Stress

The reliability of the three scales were calculated and presented with mean scores for depression, anxiety and post-traumatic stress in Table 4.6, with the differential descriptives for nurses and doctors presented in Table 4.7. The scales showed acceptable (for depression scale) to high reliability (for anxiety and post-traumatic scales).

Table 4.6. Descriptive Statistics for Depression, Anxiety and PTSD

	N	Minimum	Maximum	Mean	Std. Deviation	Reliability
Depression	200	.00	20.00	10.61	3.89	.690
Anxiety	200	.00	18.00	10.14	4.04	.846
PTSD	200	.00	71.00	25.13	14.48	.928

Table 4.7. Depression, anxiety and PTSD of doctors and nurses

Profession		N	Minimum	Maximum	Mean	Std. Deviation
Doctors	Depression	56	.00	18.00	10.14	4.36
	Anxiety	56	1.00	17.00	9.01	3.80

	PTSD	56	.00	71.00	19.96	15.03
Nurses	Depression	137	2.00	20.00	10.74	3.62
	Anxiety	137	.00	18.00	10.63	4.03
	PTSD	137	.00	66.00	27.06	13.61

Categorization of the scores were done according to the manuals of the various tests and the results are presented in Table 4.8. In the entire cohort 78%, 78% and 26.5% of the participants had a positive screen for depression, anxiety and PTSD symptoms respectively. Stratification for profession, on the overall doctors had 71.4%, 73.2% and 19.6% depression, anxiety and PTSD symptoms. Whereas, nurses 72%, 81% and 27.7% had clinically significant symptoms of depression, anxiety and PTSD respectively.

Table 4.8. Categories of Depression, Anxiety and PTSD

Disorder	Group	Doctors		Nurses		Cohort	
		n	%	n	%	n	%
Depression	Normal	16	28.6	26	19.0	44	22.0
	Borderline Abnormal	11	19.6	36	26.3	48	24.0
	Abnormal	29	51.8	75	54.7	108	54.0
Anxiety	Normal	15	26.8	26	19.0	44	22.0
	Borderline Abnormal	14	25.0	20	14.6	34	17.0
	Abnormal	27	48.2	91	66.4	122	61.0
Post-traumatic Stress	Normal	45	80.4	99	72.3	147	73.5
	Post-traumatic Stress	11	19.6	38	27.7	53	26.5

*Normal: refers to screening scores consistent with the absence of depressive, anxiety or post-traumatic stress.

4.4. Relationship between variables

4.4.1 Relationship between Depression, Anxiety and PTSD

The relationship between depression, anxiety and PTSD is presented in Table 4.9. The results show a moderately strong positive correlation between PTSD and Anxiety ($p = .000$; $r = .466$) and PTSD and Depression ($p = .000$; $r = .315$). There was a strong positive correlation between Anxiety and Depression ($p = .000$; $r = .631$). This suggested a moderate to strong comorbidity between the variables, with higher levels in one correlating with higher levels of the other.

Table 4.9. Pearson Correlation Depression, Anxiety and PTSD

		PTSD	Anxiety	Depression
PTSD	Pearson Correlation	1	.466**	.315**
	Sig. (2-tailed)		.000	.000
Anxiety	Pearson Correlation	.466**	1	.631**
	Sig. (2-tailed)	.000		.000
Depression	Pearson Correlation	.315**	.631**	1
	Sig. (2-tailed)	.000	.000	

** . Correlation is significant at the 0.01 level (2-tailed).

4.4.2 Correlation of Depression, Anxiety and PTSD with age and work experience

The depression, anxiety and post-traumatic stress of the participants were correlated with their age and work experience. The results are presented in Table 4.10. A weak positive correlation ($r = .191$; $p = .000$) was observed between age and PTSD. The older participants were, the higher their PTSD levels were. No significant correlations were observed for any of the disorders and the work experience of participants.

Table 4.10. Correlation of Depression, Anxiety and PTSD with age and work experience.

		Age	Work Exp	PTSD	Anxiety	Depression
Age	Pearson Corr	1	.542**	.191**	.031	.098
	Sig. (2-tailed)		.000	.007	.662	.167
Work Exp	Pearson Corr	.542**	1	.092	.072	.062
	Sig. (2-tailed)	.000		.195	.309	.384
PTSD	Pearson Corr	.191**	.092	1	.466**	.315**
	Sig. (2-tailed)	.007	.195		.000	.000
Anxiety	Pearson Corr	.031	.072	.466**	1	.631**
	Sig. (2-tailed)	.662	.309	.000		.000
Depression	Pearson Corr	.098	.062	.315**	.631**	1
	Sig. (2-tailed)	.167	.384	.000	.000	

** . Correlation is significant at the 0.01 level (2-tailed).

Correlations between age and work experience were calculated for both doctors and nurses and presented in Table 4.11. While a weak negative correlation between age and anxiety was observed, no significant correlations were observed for doctors. Older nurses in this study seemed to be less anxious during the pandemic, while work experience did not contribute to the experience of the pandemic.

Table 4.11. Correlation of depression, anxiety and PTSD with age and work experience of doctors and nurses.

Variable	Group	Statistic	Age	Work experience
Depression	Doctors	Pearson Correlation	-.140	-.135
		Sig. (2-tailed)	.304	.320
	Nurses	Pearson Correlation	.157	.109
		Sig. (2-tailed)	.068	.203
Anxiety	Doctors	Pearson Correlation	.032	.084
		Sig. (2-tailed)	.815	.540
	Nurses	Pearson Correlation	-.101**	-.002
		Sig. (2-tailed)	.042	.980
PTSD	Doctors	Pearson Correlation	.076	.224
		Sig. (2-tailed)	.579	.098

Nurses	Pearson Correlation	.078	-.023
	Sig. (2-tailed)	.368	.791

4.5 Group differences

4.5.1 Gender group differences

Gender group differences were determined for the sample and were presented in Table 4.12. While no gender group differences were found for depression and anxiety, significant gender group differences were observed for PTSD, with female participants reporting significantly higher ($p = .040$; $M = 26.46$, $sd = 14.88$) PTSD than the male participants ($M = 22.09$, $sd = 13.14$) did. Female healthcare workers had significantly higher PTSD than the male healthcare workers.

Table 4.12. Gender group differences

	Gender	N	Mean	Std. Deviation	Std. Error Mean	Sign.
Depression	Male	61	10.47	3.77	.483	.743
	Female	139	10.66	3.96	.335	
Anxiety	Male	61	9.77	3.80	.487	.378
	Female	139	10.30	4.14	.351	
PTSD	Male	61	22.09	13.14	1.68	.040
	Female	139	26.46	14.88	1.26	

4.5.2 Differences for type of employment

No significant differences ($p > .05$) were found between the depression, anxiety and PTSD of full-time and part-time healthcare workers (see Table 4.13).

Table 4.13: Employment group differences

	Appointment	N	Mean	Std. Deviation	Std. Error Mean	Sign.
Depression	Full-time	196	10.62	3.92	.28	.753

	Part-time	4	10.00	2.16	1.08	
Anxiety	Full-time	196	10.19	4.04	.28	.188
	Part-time	4	7.50	3.31	1.65	
PTSD	Full-time	196	25.34	14.22	1.01	.138
	Part-time	4	14.50	24.47	12.23	

4.5.3 Differences for healthcare workers who had covid-19 or not

No significant differences ($p > .05$) were found between the depression, anxiety and PTSD of healthcare workers who had covid-19 and those who did not (see Table 4.14).

Table 4.14. Differences for healthcare workers who had covid-19 or not

	Covid Test	N	Mean	Std. Deviation	Std. Error Mean	Sign
Depression	Yes	91	10.67	4.24	.444	.842
	No	109	10.55	3.60	.345	
Anxiety	Yes	91	10.09	4.19	.440	.896
	No	109	10.17	3.93	.376	
PTSD	Yes	91	24.76	15.93	1.67	.748
	No	109	25.43	13.19	1.26	

4.5.4. Differences between healthcare workers working in different risk areas of the hospitals

Group differences for healthcare workers working in high and low risk areas for covid-19 are presented in Table 4.15. No significant differences ($p > .05$) were found between the depression and PTSD of healthcare workers who worked in higher or lower risk areas. However, a statistically significant difference ($p = .030$) was found between the anxiety levels of workers in the various risk areas. Bonferroni post-hoc analysis indicated that the anxiety of healthcare workers in the high-risk areas ($p = .030$; $M = 11.04$, $sd = 3.74$) was significantly higher than the anxiety of healthcare workers working in the low risk areas ($m = 8.38$, $sd = 4.13$).

Table 4.15. Group differences for healthcare workers working in the different risk areas

		N	Mean	Std. Deviation	Std. Error	Sign
Depression	Low Risk Area	13	9.61	4.38	1.21	.217
	Moderate Risk Area	115	10.34	3.92	.365	
	High Risk Area	72	11.20	3.73	.440	
Anxiety	Low Risk Area	13	8.38	4.13	1.14	.030
	Moderate Risk Area	115	9.77	4.12	.384	
	High Risk Area	72	11.04	3.74	.441	
PTSD	Low Risk Area	13	23.30	15.07	4.18	.888
	Moderate Risk Area	115	25.37	14.54	1.35	
	High Risk Area	72	25.06	14.45	1.70	

4.5.4 Group differences for various occupational groups

The results for the depression, anxiety and PTSD of doctors, nurses and administrative staff members are presented in Table 4.16 below. No significant differences ($p > .05$) were found for the depression of healthcare workers in the various occupational groups. However, a statistically significant difference was found between the anxiety levels ($p = .039$) and PTSD ($p = .003$) of workers in the various occupational groups. Bonferroni post-hoc analysis indicated that nurses had significantly higher levels of anxiety ($p = .039$; $M = 10.63$, $sd = 4.03$) than doctors ($M = 9.01$, $sd = 3.80$) and administrators ($M = 10.50$, $sd = 4.32$). The results further indicated that both nurses ($M = 27.06$, $sd = 13.61$) and administrators ($M = 33.33$, $sd = 14.44$) had significantly higher PTSD ($p = .003$) than doctors ($M = 19.96$, $sd = 15.03$) had.

Table 5. Group differences for Doctors, Nurses and Administrative staff members

		N	Mean	Std. Deviation	Std. Error	Sign
Depression	Doctors	56	10.14	4.36	.583	.425
	Nurses	137	10.74	3.62	.309	
	Administrators	6	12.00	5.72	2.33	
	Total	199	10.61	3.90	.277	
Anxiety	Doctors	56	9.01	3.80	.508	.039

	Nurses	137	10.63	4.03	.344	
	Administrators	6	10.50	4.32	1.76	
	Total	199	10.17	4.02	.285	
PTSD	Doctors	56	19.96	15.03	2.00	.003
	Nurses	137	27.06	13.61	1.16	
	Administrators	6	33.33	14.44	5.89	
	Total	199	25.25	14.40	1.02	

4.6. Close

The results were presented in this chapter and will be discussed in the next chapter.

CHAPTER 5

DISCUSSION

5.1 Introduction

In this chapter, a comprehensive examination of the results is undertaken, involving a comparative analysis of the findings from this cross-sectional survey in relation to the existing body of literature pertaining to the ramifications of the COVID-19 pandemic on the mental well-being of healthcare providers, specifically doctors and nurses. Given their pivotal role on the frontline of the battle against COVID-19, healthcare workers are inherently more susceptible to the adverse consequences of the disease than the general populace. The escalation of workplace stress is causally linked to the heightened prevalence of mental health disorders among healthcare professionals, with a particular focus on nurses and doctors.

5.2 Depression

In this study, it was found that 71.4% of doctors and 72% of nurses exhibited clinically significant symptoms of depression. These results stand out as notably higher when compared to similar studies conducted in both the general population and healthcare workers across different regions of the world. For instance, in a study conducted in Wuhan, China (n = 1257), the prevalence of depression among healthcare workers was reported as 50.4% (Mascayano et al., 2022). Additionally, the proportion of healthcare workers experiencing depression in our study surpasses that reported in other countries such as Nepal (37.5%), Saudi Arabia (55.2%), Togo (51.6%), and Kenya (53.6%) (AlAteeq et al., 2020; Kounou et al., 2020; Shah et al., 2021).

Furthermore, the findings pertaining to COVID-19-associated depression in our study exceeded the proportions observed in other South African studies conducted in Gauteng (50.4%) and Kwazulu Natal (54.5%) (Dawood et al., 2022; Engelbrecht et al., 2021). On the other hand, it is worth noting that even higher proportions of depressive symptoms were identified in studies conducted in India (98.5%) and Poland (100%) (Suryavanshi et al., 2020; Wańkiewicz et al., 2020).

5.3 Anxiety

In this study, it was revealed that 73.2% of doctors and 81% of nurses exhibited clinically significant symptoms of anxiety. These findings notably surpass the prevalence of anxiety symptoms observed in the general population, which stood at 50.9% in a study with a sample size of 93,569 individuals (Xiong et al., 2020).

Furthermore, when compared to studies conducted in various other regions, the prevalence of anxiety symptoms in our study exceeded the rates reported in China (44.6%), Nepal (41.9%), Saudi Arabia (51.4%), Germany (37.5%), and the United Kingdom (50%) (AlAteeq et al., 2020; Hummel et al., 2021; Kounou et al., 2020; Shah et al., 2021). In comparison to other South African studies conducted in Gauteng (44.6%) and Kwazulu Natal (47.2%), the participants in our study reported a higher prevalence of anxiety symptoms. However, it is important to note that the proportion

of anxiety symptoms observed in our study was lower than that reported in studies conducted in India (98.5%) and Poland (99.5%) (Suryavanshi et al., 2020; Wańkowicz et al., 2020).

5.4 Post-traumatic Stress among doctors and nurses during the covid-19 pandemic

In this study, it was observed that 19.6% of doctors and 27.7% of nurses exhibited clinically significant symptoms of posttraumatic stress. These figures represent a notable contrast to the prevalence reported within the general population during the pandemic, which stood at 53.8% (n = 93,569) (Forte et al., 2020; Kaseda and Levine, 2020). Furthermore, an overwhelming majority of Covid-19 survivors, specifically 96.2%, displayed symptoms indicative of posttraumatic stress (Forte et al., 2020; Kaseda and Levine, 2020). Another study conducted in the context of the Free State in South Africa, involving 285 nurses, reported that 44% of participants screened positive for posttraumatic stress symptoms (Engelbrecht et al., 2021).

5.3 Relationship between Depression, Anxiety and PTSD

In this study, it was observed that participants with elevated scores on anxiety symptom screening were more likely to exhibit heightened screening scores for depression and posttraumatic stress symptoms. It is worth noting that while this study did not assess participants for pre-existing psychiatric conditions, there appears to be a shared pathophysiological mechanism between anxiety and depression, or a reciprocal relationship where one exacerbates the other and vice versa. Numerous authors have highlighted that the Covid-19 pandemic is likely to exacerbate the clinical presentation of individuals with pre-existing psychiatric conditions and could potentially induce psychiatric conditions in individuals with a predisposition (Xiong et al., 2020; Horesh and Brown, 2020).

5.5 Group differences for healthcare workers working in the different risk areas

This study uncovered that both frontline and non-frontline healthcare workers exhibited higher levels of anxiety, as measured by the HADS screening tool. This finding aligns with similar observations reported in studies conducted in various regions, including Egypt, China, India, Europe, Latin America, and Spain (S. X. Zhang & Chen, 2021).

The study's participants primarily consisted of females, approximately 40 years of age, and were predominantly employed in the nursing profession. Although direct associations were not established between these demographic characteristics and the study's outcomes, numerous authors have noted that female healthcare workers around the age of 40, particularly those with pre-existing psychiatric conditions, may be particularly susceptible to the adverse mental health effects resulting from the Covid-19 pandemic (Xiong et al., 2020; Horesh and Brown, 2020).

5.6 Conclusion

Healthcare workers, being at the forefront of the battle against COVID-19, face a heightened vulnerability to the detrimental effects of the disease compared to the general population. Elevated workplace stress levels contribute to the increased incidence of mental health disorders among healthcare professionals, with nurses and doctors being particularly affected. Nurses, in particular, may be more susceptible due to their extended periods of direct patient care, which results in increased exposure time and a higher likelihood of cross-infections.

The levels of anxiety and depression experienced by healthcare workers at Boitumelo Regional Hospital are notably elevated, with somewhat lower prevalence observed for posttraumatic stress symptoms arising from the COVID-19 pandemic. Additionally, this study has unveiled a slightly higher prevalence of depressive, anxiety, and post-traumatic stress symptoms among nurses when compared to doctors. Furthermore, healthcare workers assigned to high-risk COVID-19 areas, such as COVID-19 wards

within the healthcare facility, are more prone to registering elevated anxiety screening scores in comparison to their counterparts working in lower-risk areas. In addition, respondents that had high anxiety screening values were more likely to have high depression and posttraumatic stress screening scores. The converse is also true. Furthermore, it was found that nurses were more likely to higher anxiety screening scores than doctors. These findings are vital to guide an employee support programmes in health facilities in order to mitigate the effects of the covid-19 pandemic and its sequelae on healthcare workers. Example of employee wellness programmes includes mental health awareness days, debriefing sessions and group therapy to review the impact of the COVID-19 pandemic on health care workers at Boitumelo Regional Hospital.

REFERENCE LIST

- Adaa.org. 2015. Facts & Statistics | Anxiety and Depression Association of America, ADAA. [online] Available at: <<http://www.adaa.org/about-adaa/press-room/facts-statistics>> [Accessed 14 January 2015].
- AlAteeq, D. A., Aljhani, S., Althiyabi, I., & Majzoub, S. (2020). Mental health among healthcare providers during coronavirus disease (COVID-19) outbreak in Saudi Arabia. *Journal of Infection and Public Health*, 13(10), 1432–1437. <https://doi.org/10.1016/j.jiph.2020.08.013>
- American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders: DSM-5. Arlington, VA, American Psychiatric Association.
- Assefa, N., Abdullahi, Y. Y., Hemler, E. C., Lankoande, B., Wang, D., Madzorera, I., Millogo, O., Abokyi, L. N., Dasmane, D., Dianou, K., Chukwu, A., Workneh, F., Mapendo, F., Ismail, A., Abubakari, S. W., Smith, E., Oduola, A., Soura, A., Sie, A., ... Fawzi, W. W. (2022). Continued disruptions in health care services and mental health among health care providers during the COVID-19 pandemic in five sub-Saharan African countries. *Journal of Global Health*, 12. <https://doi.org/10.7189/jogh.12.05046>
- Babbie, E. R. 2010. The Practice of Social Research. 12th ed. Belmont, CA: Wadsworth Cengage, 2010.
- Bjelland, I., Dahl, A., Haug, T. & Neckelmann, D. (2002). The validity of the Hospital Anxiety and Depression Scale: an updated literature review. *Journal of psychosomatic research*, 52, 69-77.
- Charlson, F., van Ommeren, M., Flaxman, A., Cornett, J., Whiteford, H., & Saxena, S. (2019). New WHO prevalence estimates of mental disorders in conflict settings: a systematic review and meta-analysis. *Lancet*, 394, 240–248.
- Clark, K. R. (2018). Learning theories: behaviorism. *Radiologic technology*, 90(2), 172-175.
- Cree, R. A., Okoro, C. A., Zack, M. M., & Carbone, E. (2020). Frequent mental distress among adults, by disability status, disability type, and selected characteristics—United States, 2018. *Morbidity and Mortality Weekly Report*, 69(36), 1238.
- Dawood, B., Tomita, A., & Ramlall, S. (2022). ‘Unheard,’ ‘uncared for’ and ‘unsupported’: The mental health impact of Covid -19 on healthcare workers in

- KwaZulu-Natal Province, South Africa. *PLOS ONE*, 17(5), e0266008.
<https://doi.org/10.1371/journal.pone.0266008>
- Engelbrecht, M. C., Heunis, J. C., & Kigozi, N. G. (2021). Post-traumatic stress and coping strategies of south african nurses during the second wave of the covid-19 pandemic. *International Journal of Environmental Research and Public Health*, 18(15). <https://doi.org/10.3390/ijerph18157919>
- Forte, G., Faveiri, F., Tambelli, R. & Casagrande, M. (2020). COVID-19 Pandemic in the Italian Population: Validation of a Post-Traumatic Stress Disorder Questionnaire and Prevalence of PTSD Symptomatology. *International Journal of Environmental Research and Public Health*, 17, 4151.
- Giusti, E. M., Pedroli, E., D'Aniello, G. E., Badiale, C. S., Pietrabissa, G., Manna, ... et al. (2020). The psychological impact of the COVID-19 outbreak on health professionals: a cross-sectional study. *Frontiers in Psychology*, 11.
- Horesh, D. & Brown, A. D. (2020). Traumatic stress in the age of COVID-19: A call to close critical gaps and adapt to new realities. *Psychological Trauma: Theory, Research, Practice, and Policy*, 12, 331.
- Hummel, S., Du, J., & Almeida, R. (2021). *Mental health of medical professionals during the COVID-19 pandemic in eight European countries: A cross-sectional survey (Preprint)* STRESS AND EMOTIONAL PROFILE OF HEALTH CARE WORKERS AND NON-MEDICAL PROFESSIONALS DURING COVID-19 View project Informal Caregiving and Frailty in very Old Age View project. <https://doi.org/10.2196/preprints.24983>.
- Engelbrecht, M. C., Heunis, J. C., & Kigozi, N. G. (2021). Post-Traumatic stress and coping strategies of South African nurses during the second wave of the COVID-19 pandemic. *International Journal of Environmental Research and Public Health*, 18(15), 7919. <https://doi.org/10.3390/ijerph18157919>
- Kaseda, E. T., & Levine, A. J. (2020). Post-traumatic stress disorder: A differential diagnostic consideration for COVID-19 survivors. *The Clinical Neuropsychologist*, 34(7-8), 1498-1514.
- Kathirvel, N. (2020). Post COVID-19 pandemic mental health challenges. *Asian journal of psychiatry*, 53, 102430.
- Khanal, P., Devkota, N., Dahal, M., Paudel, K., & Joshi, D. (2020). Mental health impacts among health workers during COVID-19 in a low resource setting: A

- cross-sectional survey from Nepal. *Globalization and Health*, 16(1).
<https://doi.org/10.1186/s12992-020-00621-z>
- Kounou, K. B., Guédénou, K. M., Foli, A. A. D., & Gnassounou-Akpa, E. (2020). Mental health of medical professionals during the COVID-19 pandemic in Togo. In *Psychiatry and Clinical Neurosciences* (Vol. 74, Issue 10, pp. 559–560). Blackwell Publishing. <https://doi.org/10.1111/pcn.13108>
- Laursen TM, Nordentoft M, Mortensen PB. Excess early mortality in schizophrenia. *Annual Review of Clinical Psychology*, 2014;10,425-438.
- Lee, H. L., Wilson, K. S., Bernstein, C., Naicker, N., Yassi, A., & Spiegel, J. M. (2022). Psychological Distress in South African Healthcare Workers Early in the COVID-19 Pandemic: An Analysis of Associations and Mitigating Factors. *International Journal of Environmental Research and Public Health*, 19(15).
<https://doi.org/10.3390/ijerph19159722>
- Lee, S. A. (2020). Coronavirus Anxiety Scale: A brief mental health screener for COVID-19 related anxiety. *Death studies*, 44(7), 393-401.
- Li, Yufei, et al. "Prevalence of depression, anxiety and post-traumatic stress disorder in health care workers during the COVID-19 pandemic: A systematic review and meta-analysis." *PloS one* 16.3 (2021): e0246454.
- Robertson, L. J., Maposa, I., Somaroo, H., & Johnson, O. (2020). Mental health of healthcare workers during the COVID-19 outbreak: A rapid scoping review to inform provincial guidelines in South Africa. *South African Medical Journal*, 110(10), 1010-1019
- . Makhubela, M. (2018). Latent structure of the Post-Traumatic Stress Disorder (PTSD) checklist for DSM-5 (PCL-5) in South African mortuary workers. *Journal of Psychology in Africa*, 28(3), 206-211. DOI: 10.1080/14330237.2018.1475909
- Mascayano, F., van der Ven, E., Moro, M. F., Schilling, S., Alarcón, S., Barathie, J. ... et al. (2022). The impact of the COVID-19 pandemic on the mental health of healthcare workers: study protocol for the COVID-19 HEalth caRe wOrkErS (HEROES) study. *Social Psychiatry and Psychiatric Epidemiology*, 57(3), 633–645. <https://doi.org/10.1007/s00127-021-02211-9>
- Mazza, M. G., De Lorenzo, R., Conte, C., Poletti, S., Vai, B., Bollettini, I., ... & COVID-19 BioB Outpatient Clinic Study Group. (2020). Anxiety and depression in COVID-19 survivors: Role of inflammatory and clinical predictors. *Brain, behavior, and immunity*, 89, 594-600.

- Miller, K.D. (2019). Theory and Books: What are mental health theories? Available from: <https://positivepsychology.com/mental-health-theories>.
- Mitchell, S. A., & Black, M. J. (2016). *Freud and beyond: A history of modern psychoanalytic thought*. Hachette UK.
- Pappa S, Athanasiou N, Sakkas N, Patrinos S, Sakka E, Barmparessou Z, Tsikrika S, Adraktas A, Pataka A, Migdalis I, Gida S, Katsaounou P. From Recession to Depression? Prevalence and Correlates of Depression, Anxiety, Traumatic Stress and Burnout in Healthcare Workers during the COVID-19 Pandemic in Greece: A Multi-Center, Cross-Sectional Study. *International Journal of Environmental Research and Public Health*. 2021; 18(5):2390. <https://doi.org/10.3390/ijerph18052390>
- Rossi, R., Socci, V., Talevi, D., Mensi, S., Niolu, C., Pacitti, F., ... & Di Lorenzo, G. (2020). COVID-19 pandemic and lockdown measures impact on mental health among the general population in Italy. *Frontiers in psychiatry*, 790.
- Shah, J., Monroe-Wise, A., Talib, Z., Nabiswa, A., Said, M., Abeid, A., ... & Ali, S. K. (2021). Mental health disorders among healthcare workers during the COVID-19 pandemic: a cross-sectional survey from three major hospitals in Kenya. *BMJ open*, 11(6), e050316.
- Sher, L. (2020). The impact of the COVID-19 pandemic on suicide rates. *QJM: An International Journal of Medicine*, 113(10), 707-712.
- Suryavanshi, N., Kadam, A., Dhumal, G., Nimkar, S., Mave, V., Gupta, A., Cox, S. R., & Gupte, N. (2020). Mental health and quality of life among healthcare professionals during the COVID-19 pandemic in India. *Brain and Behavior*, 10(11). <https://doi.org/10.1002/brb3.1837>
- Talevi, D., Socci, V., Carai, M., Carnaghi, G., Faleri, S., Trebbi, E., ... & Pacitti, F. (2020). Mental health outcomes of the CoViD-19 pandemic. *Rivista di psichiatria*, 55(3), 137-144.
- Tella, M. di, Romeo, A., Benfante, A., & Castelli, L. (2020a). *Mental health of healthcare workers during the COVID-19 pandemic in Italy*. <https://doi.org/10.22541/au.158878917.77777713>
- Tella, M. di, Romeo, A., Benfante, A., & Castelli, L. (2020b). *Mental health of healthcare workers during the COVID-19 pandemic in Italy*. <https://doi.org/10.22541/au.158878917.77777713>

- The Presidency, Republic of South Africa, (2020). President Cyril Ramaphosa: Extension of Coronavirus COVID-19 lockdown to the end of April. Available from: <https://www.gov.za/speeches/president-cyril-ramaphosa-extension-coronavirus-covid-19-lockdown-end-april-9-apr-2020-0000>
- US Department of Veteran Affairs. PTSD: National Center For PTSD. Available at: <https://www.ptsd.va.gov/professional/assessment/adult-sr/ptsd-checklist.asp> (Accessed: 29th December 2019).
- Wańkiewicz, P., Szylińska, A., & Rotter, I. (2020). Assessment of mental health factors among health professionals depending on their contact with covid-19 patients. *International Journal of Environmental Research and Public Health*, 17(16), 1–8. <https://doi.org/10.3390/ijerph17165849>
- WHO. (2018). Global action plan on physical activity 2018–2030: more active people for a healthier world. Geneva: Licence: CC BY-NC-SA 3.0 IGO.
- WHO. (2019). Naming the coronavirus disease (COVID-19) and the virus that causes it. Available from: [https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/naming-the-coronavirus-disease-\(covid-2019\)-and-the-virus-that-causes-it](https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/naming-the-coronavirus-disease-(covid-2019)-and-the-virus-that-causes-it).
- WHO. (2020). Mental health and COVID-19. Available from: <http://www.euro.who.int/en/health-topics/health-emergencies/coronavirus-covid-19/novel-coronavirus-2019-ncov-technical-guidance-OLD/coronavirus-disease-covid-19-outbreak-technical-guidance-europe-OLD/mental-health-and-covid-19>.
- WHO. (2020). Mental health atlas 2020. Geneva: World Health Organization. Available from: <https://www.who.int/publications/i/item/9789240036703>
- WHO. (2021). WHO's Comprehensive Mental Health Action Plan 2013-2020. Available from: <https://www.who.int/publications/i/item/9789240031029>.
- WHO. (2022). Mental Health and COVID-19: Early evidence of the pandemic's impact. Geneva: World Health Organization; 2022. Available from: https://www.who.int/publications/i/item/WHO-2019-nCoV-Sci_Brief-Mental_health-2022.1
- Xiong, J., Lipsitz, O., Nasri, F., Lui, L. M., Gill, H., Phan, L., ... & McIntyre, R. S. (2020). Impact of COVID-19 pandemic on mental health in the general population: A systematic review. *Journal of affective disorders*, 277, 55-64..
- Zhang, S. X., & Chen, J. (2021). Scientific evidence on mental health in key regions under the COVID-19 pandemic—meta-analytical evidence from Africa, Asia,

China, Eastern Europe, Latin America, South Asia, Southeast Asia, and Spain.
European Journal of Psychotraumatology, 12(1).
<https://doi.org/10.1080/20008198.2021.2001192>

- Zhang, W. R., Wang, K., Yin, L., Zhao, W. F., Xue, Q., Peng, M., Min, B. Q., Tian, Q., Leng, H. X., Du, J. L., Chang, H., Yang, Y., Li, W., Shangguan, F. F., Yan, T. Y., Dong, H. Q., Han, Y., Wang, Y. P., Cosci, F., & Wang, H. X. (2020). Mental Health and Psychosocial Problems of Medical Health Workers during the COVID-19 Epidemic in China. *Psychotherapy and Psychosomatics*, 89(4), 242–250.
<https://doi.org/10.1159/000507639>
- Zigmond, A. S., & Snaith, R. P. (1983). The hospital anxiety and depression scale. *Acta psychiatrica scandinavica*, 67(6), 361-370.
(<https://vizhub.healthdata.org/gbd-results/>, accessed 14 May 2022).

APPENDICES

APPENDIX 1 QUESTIONNAIRE

A. Demographic questionnaire

Study No:.....

1. Gender

Male	
Female	

2. Ancestry

1. African	
2. Asian	
3. Indian	
4. Coloured	
5. South Africa white	

3. Discipline

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4. Age in year

20-30	
31-40	
41-50	
51-60	
>60	

5. Rank

1. Community service	
2. Medical officer	
3. Intern doctor	
4. Specialist	
5. Specialist nurse	

6. Professional nurse	
7. Staff nurse	
8. Assistant nurse	

6. Length of time in present Rank

1. 0-3 months	
2. 4-12 months	
3. 13 months- 5 years	
4. >5years	

7. How long have you been working in your current hospital?

1. 0-3months	
2. 4-12 months	
3. 13 months-5 yrs	
4. >5 years	

8. Do you work full time or on a sessional basis?

1. Full time	
2. Sessions	

If sessions, how many sessions per week?

(A session= a morning, eg; 8am-1pm, afternoon, eg; 1pm-5pm or a night call eg; 5pm-8am)

1 session	
2-4 sessions	
5 or more sessions	

9. Were you diagnosed with COVID 19

disease? If so when

Yes	
No	
If yes, when (date)	

B. Hospital Anxiety and Depression Scale

Hospital Anxiety and Depression Scale (HADS)

Tick the box beside the reply that is closest to how you have been feeling in the past week.
Don't take too long over you replies: your immediate is best.

D	A		D	A	
		I feel tense or 'wound up':			I feel as if I am slowed down:
3		Most of the time	3		Nearly all the time
2		A lot of the time	2		Very often
1		From time to time, occasionally	1		Sometimes
0		Not at all	0		Not at all
		I still enjoy the things I used to enjoy:			I get a sort of frightened feeling like 'butterflies' in the stomach:
0		Definitely as much	0		Not at all
1		Not quite so much	1		Occasionally
2		Only a little	2		Quite Often
3		Hardly at all	3		Very Often
		I get a sort of frightened feeling as if something awful is about to happen:			I have lost interest in my appearance:
3		Very definitely and quite badly	3		Definitely
2		Yes, but not too badly	2		I don't take as much care as I should
1		A little, but it doesn't worry me	1		I may not take quite as much care
0		Not at all	0		I take just as much care as ever
		I can laugh and see the funny side of things:			I feel restless as I have to be on the move:
0		As much as I always could	3		Very much indeed
1		Not quite so much now	2		Quite a lot
2		Definitely not so much now	1		Not very much
3		Not at all	0		Not at all
		Worrying thoughts go through my mind:			I look forward with enjoyment to things:
3		A great deal of the time	0		As much as I ever did
2		A lot of the time	1		Rather less than I used to
1		From time to time, but not too often	2		Definitely less than I used to
0		Only occasionally	3		Hardly at all
		I feel cheerful:			I get sudden feelings of panic:
3		Not at all	3		Very often indeed
2		Not often	2		Quite often
1		Sometimes	1		Not very often
0		Most of the time	0		Not at all
		I can sit at ease and feel relaxed:			I can enjoy a good book or radio or TV program:
0		Definitely	0		Often
1		Usually	1		Sometimes
2		Not Often	2		Not often
3		Not at all	3		Very seldom

Please check you have answered all the questions

Scoring:

Total score: Depression (D) _____ Anxiety (A) _____

0-7 = Normal

8-10 = Borderline abnormal (borderline case)

11-21 = Abnormal (case)

C. PCL-5

PCL-5

Instructions: Below is a list of problems that people sometimes have in response to a very stressful experience. Please read each problem carefully and then circle one of the numbers to the right to indicate how much you have been bothered by that problem in the past month.

In the past month, how much were you bothered by:	Not at all	A little bit	Moderately	Quite a bit	Extremely
1. Repeated, disturbing, and unwanted memories of the stressful experience?	0	1	2	3	4
2. Repeated, disturbing dreams of the stressful experience?	0	1	2	3	4
3. Suddenly feeling or acting as if the stressful experience were actually happening again (as if you were actually back there reliving it)?	0	1	2	3	4
4. Feeling very upset when something reminded you of the stressful experience?	0	1	2	3	4
5. Having strong physical reactions when something reminded you of the stressful experience (for example, heart pounding, trouble breathing, sweating)?	0	1	2	3	4
6. Avoiding memories, thoughts, or feelings related to the stressful experience?	0	1	2	3	4
7. Avoiding external reminders of the stressful experience (for example, people, places, conversations, activities, objects, or situations)?	0	1	2	3	4
8. Trouble remembering important parts of the stressful experience?	0	1	2	3	4
9. Having strong negative beliefs about yourself, other people, or the world (for example, having thoughts such as: I am bad, there is something seriously wrong with me, no one can be trusted, the world is completely dangerous)?	0	1	2	3	4
10. Blaming yourself or someone else for the stressful experience or what happened after it?	0	1	2	3	4
11. Having strong negative feelings such as fear, horror, anger, guilt, or shame?	0	1	2	3	4
12. Loss of interest in activities that you used to enjoy?	0	1	2	3	4
13. Feeling distant or cut off from other people?	0	1	2	3	4
14. Trouble experiencing positive feelings (for example, being unable to feel happiness or have loving feelings for people close to you)?	0	1	2	3	4
15. Irritable behavior, angry outbursts, or acting aggressively?	0	1	2	3	4
16. Taking too many risks or doing things that could cause you harm?	0	1	2	3	4
17. Being "superalert" or watchful or on guard?	0	1	2	3	4
18. Feeling jumpy or easily startled?	0	1	2	3	4
19. Having difficulty concentrating?	0	1	2	3	4
20. Trouble falling or staying asleep?	0	1	2	3	4

APPENDIX 2: ETHICAL CLEARANCE UNIVERSITY OF FORT HARE



University of Fort Hare
Together in Excellence

HEALTH RESEARCH ETHICS COMMITTEE

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ETHICAL CLEARANCE CERTIFICATE REC-100118-054

Certificate Reference Number: **Ref #2021=09=03=Finger-MotsepeK**
Project title: The impact of COVID-19 on depression, anxiety and stress levels in doctors and nurses at a South African health facility
Nature of Project: Masters of Public Health
Principal Researcher: Finger-Motsepe K
Student Number: 202015407
Supervisor: Prof RL van Niekerk

On behalf of the University of Fort Hare Health Research Ethics Committee (HREC), I hereby give ethical approval in respect of the undertakings contained in the above-mentioned project and research instruments(s). Should any other instruments be used, these require separate authorization. The Researcher may therefore commence with the research as from the date of this certificate, using the reference number indicated above.

Please note that the HREC must be informed immediately of

- Any material change in the conditions or undertakings mentioned in the document
- Any material breaches of ethical undertakings or events that impact upon the ethical conduct of the research

The Principal Researcher must report to the HREC in the prescribed format, where applicable, annually, and at the end of the project, in respect of ethical compliance.

The HREC retains the right to

- Withdraw or amend this Ethical Clearance Certificate if
 - Any unethical principles or practices are revealed or suspected
 - relevant information has been withheld or misrepresented
 - regulatory changes of whatsoever nature so require
 - the conditions contained in the Certificate have not been adhered to
- Request access to any information or data at any time during the course or after completion of the project.



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HEALTH RESEARCH ETHICS COMMITTEE

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- In addition to the need to comply with the highest level of ethical conduct principal investigators must report back annually as an evaluation and monitoring mechanism on the progress being made by the research. Such a report must be sent to HREC monitoring@ufh.ac.za.

The Ethics Committee wishes you well in your research endeavours.

Yours sincerely

Professor DT Goon
Chairperson: HREC
6th September 2021

APPENDIX 3: ETHICAL CLEARANCE FREE STATE DEPARTMENT OF HEALTH



health

Department of
Health
FREE STATE PROVINCE

16 November 2021

Dr K Finger-Motsepe
School of Public Health
University of Fort Hare

Dear K finger-Motsepe

Subject: The Impact of COVID-19 on Depression, Anxiety and Stress levels in Doctors and Nurses at South African health Facilities

- Please ensure that you read the whole document, Permission is hereby granted for the above – mentioned research on the following conditions;
- Participation in the study must be voluntary
- A written consent by each participant must be obtained.
- Serious adverse events to be reported to the Free State department of health and/ or termination of the study
- Ascertain that your data collection exercise neither interferes with the day-to-day running of **Boitumelo Hospital** nor the performance of duties by the respondents or health care workers.
- The DOH expects that the researcher will be the responsible data manager according to the POPI Act. The responsibility thus lies with the researcher to ensure that the processing of all participant's personal information and research data is lawful according to the stipulations of the POPI Act (Protection of Personal Information Act 4 of 2013).
- Confidentiality of information will be ensured and please do not obtain information regarding the identity of the participants.
- Department of Health to be fully indemnified from any contravention of the POPI Act as you conduct this study.
- **Research results and a complete report should be made available to the Free State Department of Health on completion of the study (a hard copy plus a soft copy).**
- Progress report must be presented not later than one year after approval of the project to the Ethics Committee of the University of Fort Hare and to Free State Department of Health.
- Any amendments, extension or other modifications to the protocol or investigators must be submitted to the Ethics Committee of the University of Fort Hare and to Free State Department of Health.
- **Conditions stated in your Ethical Approval letter should be adhered to and a final copy of the Ethics Clearance Certificate should be submitted to sebecelats@fshealth.gov.za/gwantshuws@fshealth.gov.za before you commence with the study**
- No financial liability will be placed on the Free State Department of Health
- **Please discuss your study with Institution Manager on commencement for logistical arrangements.**
- Department of Health to be fully indemnified from any harm that participants and staff experiences in the study
- **As part of feedback you will be required to present your study findings/results at the Free State Provincial health research day**

Trust you find the above in order.

Kind Regards

MR. MNG MAHLATSI
HEAD: HEALTH

Date: 16/11/2021

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