



University of Venda

**The Psychosocial Impact of Coronavirus (COVID-19) Pandemic on
Nurses at a Selected Tertiary Hospital in Limpopo Province, South
Africa.**

BY

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A mini dissertation submitted in fulfilment of the requirement for the degree:

Master of Public Health

UNIVERSITY OF VENDA

SCHOOL OF HEALTH SCIENCES

DEPARTMENT OF PUBLIC HEALTH

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March 2023

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DECLARATION

I, Noria Madithapo Maja, declare that the mini dissertation proposal titled “***The psychosocial impact of Coronavirus (COVID-19) Pandemic on Nurses at a selected tertiary hospital in Limpopo Province, South Africa***” thus put forward for the degree Master of Public Health at the University of Venda as my own work in design and in execution, and that all reference material contained therein has been duly acknowledged.

NM Maja

Date: 10 March 2023

NORIA MADITHAPO MAJA

PREFACE

This mini-dissertation is presented in a manuscript format and comprises of four sections: Section A, which presents the overview of the study, Section B provides the manuscript of systematic literature review, Section C presents the overall manuscript, and lastly, section C presents the conclusion and recommendations of the entire mini-dissertation.

Section A: Mini Dissertation Overview

This section provides the overview that details the background, Problem statement, the rationale, significant and purpose of the study, Research question, definition of concepts and research methodology.

Section B: Papers/Articles

Systematic Literature Review: Manuscript

This section contains one manuscript on systematic literature review on the study titled “The Psychosocial impact of Coronavirus (COVID-19) Pandemic on Nurses at a selected tertiary hospital in Limpopo Province, South Africa”.

Research Manuscript:

This section contains one manuscript on research conducted on the “The Psychosocial impact of Coronavirus (COVID-19) Pandemic on Nurses at a selected tertiary hospital in Limpopo Province, South Africa”.

Section D: Conclusion and recommendation of the study

This section presents conclusions and recommendations of the mini dissertation well informed by the entire research process.

ACKNOWLEDGEMENTS

I sincerely appreciate and acknowledge the following individuals for their contributions towards accomplishment of this study:

To God, the Almighty, THANK YOU for your unconditional spiritual teaching, the power and intelligence granted in me throughout this study.

To Prof. Makhado L. and Dr. Tshivhase S.E, thank you for your advice and magnificent supervisory showed during this study, It was through your advice that I finally made this far.

To my wonderful children, Mogau and Tshogofatso, thank you so much for allowing me to invest the time that was meant to be spent with you on my studies.

To my lovely mother, Evah “Ngoashemogolo”, and my sister Pheladi Celestar, thank you for always standing in the gap for me throughout this study.

To the Management of the selected hospital, thank you for granting me the permission to conduct this study.

To the Office of the Premier, my colleagues and everyone who made it possible for this study to be a success, thank you.

My special thanks and appreciation goes to all the Nurses who dedicated their time to participate and make this study a success, I THANK YOU ALL.

LIST OF ACRONYMS AND ABBREVIATIONS

CDC	- Centres for Disease Control
COVID-19	- Coronavirus 2019
EDA	- Exploratory data analysis
HCWs/HCPs	- Health Care Workers/Providers (Used interchangeably)
IPC	- Infection Prevention and Control
PPE	- Personal Protective Equipment's
PPE	- Public Health Emergency
PTSD	-Post Traumatic Stress Disorder
QCA	- Qualitative Content Analysis
SHS	- School of Health Science SHS
SHDC	- School of Higher Degree Committee
UK	- United Kingdom
WHO	- World Health Organisation

ABSTRACT

Coronavirus (COVID-19), pose a massive threat to the wellbeing of all the members of the population in the country, but massively left the health care workers to deal with the fear and anxiety while caring for those infected by the virus. The study aimed to explore and describe the psychosocial impact of COVID-19 on Nurses at a selected hospital in Limpopo Province, South Africa. The selected hospital for this study was one of the tertiary hospitals designated to admit the COVID-19 patient. The study employed a qualitative approach using an exploratory, descriptive design. The researcher selected non-probability sampling, using a purposeful sampling technique to select a group of professional Nurses, preferably those who have been exposed and/or came into contact with a patient who tested positive for covid-19 at a selected hospital. The study used semi-structured interviews, where individual in-depth interviews were conducted using interview guide to collect data. The interview guide contained one central question to give direction to the researcher when collecting data. The collected data was analysed with the thematic analysis method in the qualitative method. The researcher ensured that research ethics were considered, including respecting the participant rights. In addition, trustworthiness was maintained by applying its four criteria: credibility, dependability, conformability, and transferability. This study revealed two major themes such as psychological impact of COVID-19 on nurses and social impact of COVID-19 on nurses. In order to expand and further explains the response provided by the participants, this study recommend that future researchers could employ Mixed methodologies, the quantitative and qualitative research approaches to give an in-depth analysis of the experiences of the nurses during COVID-19 pandemic. The study also recommend that the future researchers could expand the focus on investigating the challenges in different context, in different communities, both urban and rural to identify patterns, trends and experiences of psychological challenges among healthcare professionals. The study findings further recommend that the nurses need to be helped with capability to recover from the psychological, social trauma, fear, discrimination, and stigmatization that came with the nature of being a nurse particularly those who came in contact with patient who tested COVID-19 Positive.

Keywords: COVID-19; Hospital; Impacts; Nurses; Psychosocial; Pandemic.

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SECTION A: OVERVIEW OF THE STUDY

1.1. INTRODUCTION

Several pneumonia cases were reported in Wuhan city, China, in December 2019, and the causative agent was confirmed as Coronavirus Disease 2019 (COVID-19). The virus was first identified in Wuhan City, China. The spread of the virus occurs mainly through respiratory droplets when one comes into close contact with the infected person, especially when coughing and sneezing (Centre for Disease Control, 2020). COVID-19 had various impacts on the global social, economic, and political aspects. The economies were shrieked and ravenous (Ozili and Arun, 2020), the social life was disconcerted (Sahu, 2020), and the political sphere was filled with political conspiracies (Woods, Schertzer, Greenfeld, Hughes and Miller-Idriss, 2020). The implications of COVID-19 on front-line workers had devastating consequences, including exposure to the virus, being positive for COVID-19, psychological impact and, in some instances, resulting in death (Hong et al., 2021).

Health Care Workers, especially nurses, play an essential role at the front line within the healthcare setting, providing patient care and ensuring that infection prevention and control measures are implemented and adhered to (Powell-Jackson et al., 2020). The overwhelming burden of COVID-19 stretched the health system's capacity and increased the risk of infection among Health Care Workers. The study by Hong et al. (2021) indicated that HCWs in China had been under tremendous pressure fighting against the COVID-19 pandemic. This has put the HCWs at an intense risk of developing psychological problems. The results indicated that anxiety symptoms were prevalent (46.04%), depression (44.37%), insomnia (28.75%) and psychological problems (56.59%) compared to the HCWs who did not participate in the front-line work (Hong et al., 2021).

The psychosocial response of frontline workers during a pandemic is complex (Dubey et al., 2020). However, the impact of COVID-19 resulted in an increased risk of acquiring trauma and stress-related disorders, depression, mental and anxiety (Moreno et al., 2020; Forte et al., 2020; Lebel et al., 2020; Burrai et al., 2020; Cabarkapa et al., 2020; Henssler et al., 2020; Surrati et al., 2020). Furthermore, there is also some psychosocial strain related to the fear of the unknown and of being infected by COVID-19. The study also indicated that being a female nurse seems to confer greater risks. There is perceived stigma from the family members and society that heightened negative implications accompanied by predominate stress and isolation (Moreno et al., 2020; Forte et al., 2020; Lebel et al., 2020; Burrai et al., 2020). Coping with the regulatory measures in contrast with the socio-cultural settings and compliance had also varied in terms of psychosocial impacts on the healthcare frontline

workers. The above-shared literature revealed the dire need for psychosocial support of healthcare workers to enhance the well-being of frontline healthcare workers.

In the World Health Organization's report from 2020 on the surveillance of COVID-19 cases, China revealed that 3,300 healthcare workers had contracted the virus, accounting for 4% of the 81,285 infections that were documented. Spain had over 6,500 Health Care Providers (HCPs) infected as of March 25, 2020, making up roughly 13.6% of the nation's 47,600 total cases and 1% of the health system's workforce (Wilson and Parra: Chicago Tribute Breaking News: 23 March 2020). As of 8 April 2020, the World Health Organization documented 22 073 cases of COVID-19 among medical personnel from 52 different countries. A report on 44 672 confirmed cases as of July 17 by the Novel Coronavirus Pneumonia Response Epidemiology Team-China released in 2020.

In Africa, as of 9 September 2020, a total of 249 new COVID-19 cases of health providers infections were recorded from eight countries; Kenya 105, Uganda 52, Namibia 38, Mozambique 20, Ethiopia 12, Zambia 12, Eswatini 9, Mauritius¹ and South Africa retrospectively reported 1 519 health worker infections. South Africa remains the most affected, with a total of 27 360 health workers, with 65% of the total population of health workers (WHO, External Situation Report 28, 2020). Apart from other challenges faced by the nurses battling COVID-19 exposure and infection, the lack of protective work clothes for infection prevention and control compliance in most parts of Africa (Chersich et al., 2020).

In South Africa, COVID-19 has also been topical, with the number of infections and death toll being one of the highest in the world. HCWs were also included in the high mortality level paradox because of COVID-19 (Stribling et al., 2020). As of 10 June 2020, South Africa's Health Care Workers were found to be increasingly becoming infected with COVID-19, as hospital beds begin to fill up with a total of cases surpassing 55 000. As of 2 February 2021, the cumulative number of COVID-19 cases identified in South Africa is 1 4 58 985 with 2649 new cases. Out of the reported cumulative data, Limpopo accounts for 58340 Covid-19 Cases (National Institute for Communicable Disease, 2021).

Amid the COVID-19 pandemic, the World Health Organisation (WHO) and its partners, including UNICEF, continue to work together on tracking the COVID-19 pandemic response. They have raised the development of safe and effective vaccines (WHO, 2020). South Africa received its first load of COVID-19 vaccine, Johnson and Johnson, on 01 February 2021. It is estimated that 1.2 million front-line healthcare providers will be vaccinated during the first phase of the vaccine rollout. Since the vaccine's arrival in the country, Limpopo Province plans to vaccinate 40 000 health workers in three weeks (Ramothwala, 2021).

The emotional wellbeing of healthcare workers on the front lines of the COVID-19 outbreak was studied in Aughterson's (2020) study. The research found issues with worker-related stress, support systems, personal development, resilience, and shifting work conditions. The good impact of teamwork unity at work and more introspection on what really matters in life are noteworthy findings from this study. The daily work and activities of healthcare personnel have benefited from COVID-19. The study offers proof of the assistance healthcare professionals—primarily psychosocial assistance—need as their daily routines continue to be disrupted by the COVID-19 outbreak.

According to Rodriguez's study (2020), healthcare workers were the group most exposed to COVID-19, and its psychosocial effects are severe among them. The study found that increasing psychosocial suffering and repercussions, such as burnout syndrome, fear of vulnerability, anxiety, and psychological effects, result from how healthcare professionals are exposed to unpredictable situations that demand more human resources and materials. The COVID-19 quarantine measure's psychosocial effects were also noted in the study, which is another disadvantage for medical professionals. According to the study, social isolation among healthcare professionals led to psychosocial issues, worsening mental health issues, Post-Traumatic Stress Disorder (PTSD), and increased stress from job overload that appeared concurrently with the emergence of COVID-19.

Healthcare's response to the pandemic depends upon a mentally and physically healthy workforce (Robertson et al., 2020). However, the COVID-19 outbreak caused a lot of mental distress and mental trauma among most HCWs, especially the nurse, which negatively impacted how healthcare services are being rendered. The rapid scoping review showed that the HCWs in South Africa suffered from depression, anxiety, post-traumatic stress and other mental health conditions. It shows that healthcare workers, particularly nurses, experience psychological and mental difficulties due to the COVID-19 pandemic (Aughterson, McKinlay, Fancourt and Burton, 2021). Self-isolation and quarantine were among the measures to reduce the spread of COVID-19. However, those measures contributed to the nurse's frustration, fear, and feeling of negligence and trauma. A study by (Sakib, Pakpou, Griffiths and Mamun, 2020), emphasised that those factors were the most contributing factors to increase anxiety, anger, and discrimination with massive potential to trigger suicidal attempts and thoughts. The researcher reviewed various studies on the subject being investigated and noted that little has been done to investigate the psychosocial impact of the Coronavirus (COVID-19) pandemic among nurses in Limpopo Province compared to other parts of the country. Therefore, the subject was found to be critical for the investigation to confirm and explore the severity of the Psychosocial impact of COVID-19 on nurses. This study will reveal a detailed description and more knowledge regarding the psychosocial impacts of the

Coronavirus (COVID-19) pandemic on nurses at a selected hospital in Limpopo Province, South Africa.

1.2. Problem Statement

According to the Media statement released on 06 December 2020, South Africa reported 814 565 COVID-19 cases, including 22 206 deaths related to COVID-19 complications. In Limpopo Province, Capricorn district had 6067 COVID-19 cases and 212 deaths. Polokwane Municipality had 5 129 COVID-19 cases and 167 deaths. 202 Nurses, 41 Doctors and 125 other HCWs were also infected with COVID-19 (Department of Health Surveillance report, 2020). Polokwane hospital was further designated to admit COVID-19 patients in Limpopo Province. Therefore, the challenge of COVID-19 infections has been pervasive among HCWs in South Africa (Chersich, Gray, 2020).

The problem is that limited studies examine the psychosocial impact of COVID-19 Healthcare workers in Limpopo Province, South Africa. The negative psychosocial impact among healthcare workers is detrimental to causing anxiety, work-related stress, deteriorating mental health problems and, consequently, Post-Traumatic Stress Disorder (PTSD). Out of all measures put in place in response to COVID-19, there's been little attention to the well-being of healthcare workers. The overwhelming burden of illness stresses the health system's capacity and increases the risk of infection among Health Care Workers. Amongst other healthcare workers, nurses are found to be more exposed to COVID-19 patient daily, and the experience is assumed to have a massive impact on their collective well-being. Thus, the researcher found it crucial to explore further and describe the psychosocial impact of the Coronavirus (COVID-19) pandemic on nurses at the selected hospital and suggest ways to mitigate these psychosocial impacts.

1.3. The rationale of the study

One of the tertiary healthcare centres chosen to receive COVID-19 patients in Capricorn District, Limpopo Province, South Africa, was the selected hospital. One of the Province's hospitals reported the first COVID-19 case among medical personnel. The government and stakeholders devised urgent preventative measures to stop the virus's transmission amid the epidemic, including the statewide lockdown, social seclusion, hand washing, and wearing Personal Protection Equipment (PPE), such as a face mask. The substantial attention paid to the effects of COVID-19 in a particular setting is a limitation of earlier investigations. Research on the psychosocial impact of COVID-19 among nurses in the province of Limpopo is scant. The present study aims to broaden

1.4. Significance of the study

The study findings may contribute to the country's current recommendations to decrease the spread of COVID-19 among Nurses. The study findings may also assist policymakers within the Health Care system establish effective welfare strategies to optimize nurses' compliance and decrease the likelihood of infection. The results may also alert the Health Care system to provide necessary support and a better mechanism strategy for the nurses to cope with the overwhelming burden of the COVID-19 pandemic.

1.5. Purpose of the study

The purpose was to explore and describe the psychosocial impact of the Coronavirus (COVID-19) pandemic on Nurses at a selected tertiary hospital in Limpopo Province, South Africa.

1.6. Research question

The research question was:

- What is the psychosocial impact of the COVID-19 pandemic on nurses?

1.7. Definition of concepts

1.7.1. COVID-19

A new virus called the coronavirus (COVID-19) is the source of this contagious illness, which manifests as a flu-like respiratory illness with symptoms like coughing, fever, and breathing difficulties. In this study, COVID-19 describes a respiratory infection that includes flu-like symptoms as well as coughing and sneezing. The virus can spread from one person to another by contact and respiratory droplets.

1.7.2. Impact

Research impact is described as a result of a change or benefit to the economy, society, culture, public policy or services, health, and environment of quality of life outside of academia (Penfield, 2014). Impact in this study refers to modifying the nurses' psychosocial wellbeing caused by the COVID-19 condition.

1.7.3. Psychosocial

The study that looks at the connection between a person's anxieties and how they interact with others in a social situation is called a "psychosocial" study since it combines

psychological and social behaviour (Merriam-Webster, 2014). For the sake of this study, psychological notions pertain to the subjects' perspectives on the COVID-19 pandemic (mainly nurses).

1.7.4. Nurse

A person registered in a category under section 31 (1) to practice nursing or midwifery is called a nurse (The Nursing Act of 33 of 2005). They are an essential component of the healthcare system, which includes promoting health, preventing illness, and treating sick individuals of all ages in all locations, including healthcare facilities and other community facilities (International Council of Nurses, 2012). For this study, nurses are defined as individuals registered and enrolled in the nursing profession and who work in the chosen hospital in the province of Limpopo in South Africa.

2. RESEARCH METHODOLOGY

This section includes the research design which the researcher employed to collect data. The section consists of various sub-sections and is as follows: research approach and design, study setting, target population, sampling methods, and sample size, inclusion criteria, measurements instrument, data collection methods, pre-test, measures to ensure trustworthiness, plan for data collection, data management and data analysis, ethical consideration.

2.1. Research Approach

A qualitative research approach was employed in this study to describe and explore the impact of COVID-19 on Nurses. The qualitative research approach became relevant for this study because it captures a detailed understanding of the experience from the participants' perspective (Collis and Hussey, 2013). A qualitative approach is defined as an approach that focuses on the aspects of meaning, experience and understanding of phenomena or events (Brink et al., 2018).

2.2. Research Design

This study used an exploratory-descriptive design to find answers to the research topic. An exploratory-descriptive design aims to maximize the finding of generalizations that will lead to the description and understanding of a particular aspect of social or psychological existence. It is a design that enables the researcher to delve into a subject that has received little attention in the literature and permits the participants to add to the body of fresh knowledge about the study (Hunter et al., 2019).

2.3. Study Setting

The study setting is where the study will be conducted (Bejane, 2013). This study was conducted at the selected tertiary hospital in Polokwane Municipality, Limpopo Province, South Africa. The selected hospital is among the 43 public hospitals in the province, but one designated to admit and care for the COVID-19 patient within Capricorn District. The nurses were selected based on their availability on the interview day and their exposure level to COVID-19 patients. The estimated number of staff compliments within the selected hospital is about 1 560 within various departments or sections and are Nursing, Clinical, Finance and Cooperate services. The selected hospital provides holistic health care services to a culturally diverse population, mostly Pedi-speaking people from the surrounding urban and rural areas.

2.4. Study Population

The population of the study is the total number of potential units or components (Gray, 2009). The population for this study is all nurses employed by a particular hospital in the Capricorn region of South Africa's Limpopo province. All professional nurses who worked in the chosen hospital and were exposed to or came into contact with a patient who tested positive for COVID-19 comprised the target population. The hospital was primarily chosen for its central location and plenty of qualified nurses, likely from diverse backgrounds and educational levels, who have experienced COVID-19 patients to varying degrees.

2.5. Sampling

Sampling is selecting a few respondents from a bigger group to conclude the area of interest (Brink et al., 2018). This study employed non-probability sampling following the purposeful sampling technique to select a manageable group of nurses to provide detailed responses on the matter under investigation. The nurses were selected from various wards within the selected hospital, such as ICU, Wards Q, R and Wards S and Casualty, based on their availability and exposure to COVID-19 patients. The nurses who worked with the COVID-19 patients were found to be more eligible and willing to participate in the study. They provided insightful opinions regarding the psychosocial impacts of COVID-19 through their experience. The researcher approached the management of the selected hospital in Capricorn district, Limpopo province, South Africa, to seek advice and access to the nurses at the forefront in assisting COVID-19 patients.

2.6. Sample Size

The sample size is defined as the number of participants included in a study (Institute for Work and Health, 2018). For this study, the researcher interviewed 20 Nurses, and they were able to answer the research question and generate more accurate results.

2.7. Criteria for inclusion

For this study, the researcher purposefully selected both male and female nurses based on their level of exposure to COVID-19 patients, and most of them were directly exposed to patients who tested positive for COVID-19.

2.8. MEASUREMENTS INSTRUMENT

2.8.1. Data Collection methods

Data collection is the process of gathering and measuring information on variables of interest systematically (De Jonckheere and Vaughn, 2019). For this study, the researcher was the main key instrument for collecting data through an in-depth individual interview method using a semi-structured interview guide to give direction with probing questions to seek clarity and more understanding of the information provided. The participants were all from a culturally diverse facility. Therefore the in-depth individual interview was facilitated in both English and Sepedi, depending on the participant's choice.

2.9. Pre-test

A Pre-test is a method of checking whether the selected data collection tool is relevant and will yield the desired outcomes. Literature provides that one undertakes the pre-test to ensure that the interview guide is clearly understood by those likely to respond to it (Hilton, 2015). The researcher conducted a pre-test study with 10 participants from one of the tertiary hospitals with the same characteristics as the selected hospital for the main study. The pre-test process was successfully conducted without any challenges. However, the pre-test results do not form part of the study.

2.10. Measures to ensure trustworthiness.

The degree of confidence in data interpretation and the procedures followed to assure the study's validity is called trustworthiness (Pilot and Beck, 2014). This study ensured trustworthiness by applying Credibility, Dependability, Conformability, and Transferability.

2.10.1. Credibility

Credibility refers to the accuracy with which the data the researcher interprets is captured in the manner provided by the participants (Tolich and Iphofen, 2009). The researcher ensured credibility by demonstrating a prolonged engagement and observation of the participants for 30 – 45 minutes during the interview to better understand the subject until the saturation point. The researcher also used multiple methods of data collection such as interviews, notes taking and audio recording to increase the reliability of the observation. The researcher was also taking note of all non-verbal communication. The collected data was then reviewed through the application of member check, whereby the researcher repeatedly played back the recordings to the participants to confirm responses.

2.10.2. Dependability

Dependability is a term that describes the effectiveness of the integration process between the data-gathering method, data analysis, and the theory developed from the data results (Du Plooy-Cilliers et al., 2014). The researcher ensured dependability by hiring an outside moderator to verify and examine the data gathering and data analysis procedure to make sure that the data findings were consistent.

2.10.3. Conformability

Conformability refers to how well the data collected support the findings and the interpretation that follows in the research process (Stenfors et al., 2020). The researcher ensured conformability by guarding against imposing ideas. Instead, the researcher transcribed the interview recordings and used the field notes to identify characteristics relevant to the problem.

2.10.4. Transferability

Transferability refers to the ability of the research findings to be applied to similar situations and to deliver the same results. The researcher ensured transferability by providing a complete description of the research process, from identifying the research problem, data collection instruments, data presentation and data analysis.

2.11. Plan for data collection

Data collection refers to the systematic strategy of gathering and measuring data from various sources to get detailed information on the investigated subject (Stieglitz et al., 2018). The research followed all the protocols prescribed by the institution to collect data on the impact

of COVID-19 on nurses exposed to and come into contact with a patient who tested positive for COVID-19 at the selected hospital in Capricorn District, Limpopo Province, South Africa. The protocol includes a request for ethical clearance from the University Higher Degree Committee, a request for approval from the Provincial Department of Health to conduct the study at the selected facility, and a request for permission to enter the selected facility and to interview participants. After approval, the researcher engaged with the management of the facility to discuss the logistical arrangement prior to the actual day of the interview. The logistical arrangement includes the date and time of the interview session, compliance with COVID-19 regulations and provision of a safe, conducive space. Through the support and cooperation of the hospital management, a conducive and safe space was provided in the form of an office to maintain the anonymity and confidentiality of each participant through out the interview.

During an interview, the researcher explained the study's purpose to the participants and the interview proceedings. This includes time which will be about 30-60 minutes, language to be used, transparency on the use of an audio recorder and assured the participant that their anonymity and confidentiality will be maintained. The researcher fully explained the research ethics to the participants and then asked for their consent by signing informed consent. The researcher served as a key instrument during data collection, using an in-depth interview method with an unstructured interview guide to give direction. The researcher successfully interviewed 20 Nurses, giving the study a maximum level of data.

The researcher employed other communication techniques, such as nodding when the participants were responding, and continuously maintained eye contact to assure them that the researcher was listening to make them feel free and comfortable. This technique was also supplemented by more probing into participants' responses to get more detailed information on the subject. At the end of the interview session, the researcher gave a brief statement of appreciation for the participants' time dedicated to the session and assurance that all the recorded information would be kept in a safe space.

2.12. Plan for data management and analysis

This section outlines the data that will be collected for the research project and how the data will be managed and analyzed (Hodge, 2020). Data analysis is the process of looking over and changing data to find relevant information to support decisions and inform conclusions.

The researcher used theme analysis in this study to examine and describe participants' experiences concerning the phenomena being investigated. The thematic analysis technique

consists of six steps and is described as a method for locating, analyzing, and interpreting patterns of meaning (theme) within qualitative data (Clarke and Braun, 2015).

Step 1: Familiarization of the data

This is the first phase, whereby the researcher familiarises herself with the entire set of collected data by repeatedly reading, listening, and transcribing the audio to get a valuable orientation to the raw data.

Step 2: Generalising Initial Code

The researcher started with the coding process, organised the data meaningfully and systematically, highlighting sections of the text and sentences with different colours and labelling them to get the main points and common meanings recurring throughout the data.

Step 3: Search for themes

The theme is broader than codes and is defined as the pattern that captures something interesting about the research question. At this stage, the researcher looks over the created codes, identifies a pattern among them, and develops themes.

Step 4: Review themes

At this phase, the researcher review, modify and develop the preliminary themes identified in step 3 and gather all data relevant to each theme.

Step 5: Define themes

This is the final refinement of the themes, and the process includes naming, defining and identifying the meaning and getting a sense of each theme.

Step 6: Writing up

This is the study's endpoint, whereby the researcher will produce a written report or dissertation for publication.

2.13. ETHICAL CONSIDERATION

Applying moral principles and professional codes of conduct to collecting, analysing, reporting, and publishing data about study participants is considered ethical consideration. Firstly, the researcher acquired approval, quality check and ethical clearance from the University of Venda respectively from the Faculty of Health Science (FHS), the Faculty of Health Sciences Higher Degree Committee (FHDC), Executive FHDC, UHDC and the Human

and Clinical Trial Research Ethics Committee (HCTREC). Secondly, the researcher requested permission to collect data from the Provincial Department of Health. Lastly, requested permission to access and interview the Nurses who were exposed to and came into contact with patients who tested COVID-19 at the selected hospital Limpopo Province, South Africa.

2.13.1. Informed consent

Informed consent is the key principle of the research as it contains the purpose, credibility and duration of the study. The researcher fully explained the nature of the study, its purpose, and the aim of the study in full, using clear, understandable language to the participants. The researcher further emphasised the assurance of confidentiality and that the researcher will keep the information provided safely. After a thorough explanation of the content of the consent form, the researcher then requested the participant to sign the forms voluntarily. The researcher explained that participation in the study is voluntary; therefore, they are allowed to withdraw at any time during the study if they feel they don't want to participate anymore. The consent forms entail the issue of the time, venue, duration, and the time that may take when conducting the study.

2.13.2. Respect for confidentiality and privacy

The researcher ensured that the information provided by the participants will be kept safe and will remain anonymous.

2.13.3. Avoidance of harm

The fundamental ethical rule of research is that it must not harm participants (Babbie, 2007). The researcher ensured that participants were protected and not exposed to any harm throughout the study. There will be no discussions of sensitive issues in collecting participant data.

2.13.4. Voluntary participation

The researcher thoroughly explained the purpose of the study to the participant so that they could voluntarily decide to participate without any influence.

2.13.5. Honesty

This principle strives for honesty in all scientific communication. Therefore in this study, the researcher recorded all the information from the participants to ensure that data is honestly reported as it is.

2.13.6. Non-discrimination

The researcher will ensure that bias and favouritism are avoided at all costs during data analysis, especially where objectivity is expected. The researcher ensured that all the participants were treated equally regardless of gender and ethnicity.

2.14. Delimitation of the Study

The study's delimitation is that the researcher chose only to interview 20 Nurses who were exposed to and come into contact with a patient who tested positive for COVID-19 within the selected hospital. However, the aspect was additionally explained after the study was conducted.

2.15. Plan for dissemination and implementation of results

Dissemination refers to the process of sharing research findings with stakeholders. This study is qualitative in nature; therefore, the text becomes the dominant mode of communication and easy for the readers to understand the findings. The researcher will communicate results in a narrative report about major themes from the findings. The researcher will also present a report to the appropriate platform and submit it to a journal for peer review and publication. A full report of the research findings will be presented and submitted to the Provincial Department of Health, cascading it to the Executive management of the selected hospital of Capricorn District, Limpopo Province.

3. REFERENCES

- Aliakbari, F., Tavassoli, E. and Mohammadipour, F. 2020. The Predictors of Health Literacy in Patients with Chronic Obstructive Pulmonary Disease: An Application of the Social Cognitive Theory. *Journal of Clinical Nursing and Midwifery*, 9(1), pp.591-598.
- Aughterson H, McKinlay A.R, Fancourt D, 2021. Psychosocial impact on frontline health and social care professionals in the UK during the COVID-19 pandemic: a qualitative interview study. *BMJ Open* <https://bmjopen.com>
- Babbie, E.R. 2007. *The basics of Social Research (7th edition)*: Boston, MA, USA: Cengage Learning: available at <https://www.bookshelfvitalsource.com.books>.
- Bandura, A. 1986. *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice Hall.
- Bandura, A. and Hall, P. 2018. Albert bandura and social learning theory. *Learning theories for early years practice*, 63.

- Burrai, J., Roma, P., Barchielli, B., Biondi, S., Cordellieri, P., Frascchetti, A., Pizzimenti, A., Mazza, C., Ferracuti, S. and Giannini, A.M., 2020. Psychological and emotional impact of patients living in psychiatric treatment communities during Covid-19 lockdown in Italy. *Journal of clinical medicine*, 9(11), p.3787.
- Cabarkapa, S., Nadjidai, S.E., Murgier, J. and Ng, C.H., 2020. The psychological impact of COVID-19 and other viral epidemics on frontline healthcare workers and ways to address it: A rapid systematic review. *Brain, behaviour, & immunity-health*, p.100144.
- Chersich, M.F., Gray, G., Fairlie, L., Eichbaum, Q., Mayhew, S., Allwood, B., English, R., Scorgie, F., Luchters, S., Simpson, G. and Haghghi, M.M. 2020. COVID-19 in Africa: care and protection for frontline healthcare workers. *Globalization and health*, 16, 1-6.
- Clarke, V. and Braun, V. 2015. "Thematic analysis": *Journal of Positive Psychology*: University of the West of England, Bristol, UK and The University of Auckland Aoteroa/New Zealand.
- Connelly, L.M. 2016. "Trustworthiness in qualitative research, Official Journal of the Academy of Medical surgical Nurses, vol. 25. no 6. available at: <https://www.europepmc.org>
- Cresswell, J.W. 2014. "Research design", 4th edition. Sage publications. India, Pty, Ltd.
- De Jonckheere, M. and Vaughn, L.M. 2019. Semistructured interviewing in Primary Care Research: a balance of relationship and rigour. Department of Family Medicine. The University of Michigan. USA.
- Dubey s., Biswas P., Ghosh R., and Chatterjee S, 2020. Diabetes & Metabolic Syndrome: Clinical Research & Reviews (14), Elsevier Ltd: <https://www.elsevier.com>
- Fifolt, M., Richardson, E.V., Barstow, E. and Motl, R.W. 2020. Exercise behaviors of persons with multiple sclerosis through the stepwise implementation lens of social cognitive theory. *Disability and rehabilitation*, 42(7), 948-956.
- Forte, G., Favieri, F., Tambelli, R. and 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(11), p.4151.
- Henssler, J., Stock, F., van Bohemen, J., Walter, H., Heinz, A. and Brandt, L., 2020. Mental health effects of infection containment strategies: quarantine and isolation—a

- systematic review and meta-analysis. *European archives of psychiatry and clinical neuroscience*, pp.1-12.
- Hilton, C.E, 2015. The importance of Pretesting Questionnaires: a field research example of Cognitive pretesting the exercise referral quality of life social. Coventry University's Repository. *International Journal of Social Research methodology*, 20.
- Hodge, A.E. 2020. Data Management Service. California. Stanford University.
- Hong, S., Ai, M., Xu, X., Wang, W., Chen, J., Zhang, Q., Wang, L. and Kuang, L. 2021. Immediate psychological impact on nurses working at 42 government-designated hospitals during COVID-19 outbreak in China: A cross-sectional study. *Nursing outlook*, 69(1), pp.6-12.
- Hunter, D., McCallum J., Howes D. 2019. Defining Exploratory-Descriptive Qualitative (EDQ) research and considering its application to healthcare: *Journal of Nursing and Health care*: eprints.gla.ac.uk.
- Lebel, C., MacKinnon, A., Bagshawe, M., Tomfohr-Madsen, L. and Giesbrecht, G., 2020. Elevated depression and anxiety symptoms among pregnant individuals during the COVID-19 pandemic. *Journal of affective disorders*, 277, pp.5-13.
- Moreno, C., Wykes, T., Galderisi, S., Nordentoft, M., Crossley, N., Jones, N., Cannon, M., Correll, C.U., Byrne, L., Carr, S., and Chen, E.Y., 2020. How mental health care should change as a consequence of the COVID-19 pandemic. *The Lancet Psychiatry*.
- Ozili, P.K. and Arun, T. 2020. Spillover of COVID-19: impact on the Global Economy. Available at SSRN 3562570.
- Penfield, T., Baker, M. J., Scoble, R., and Wykes, M. C. 2014. Assessment, evaluations, and definitions of research impact: A review. *Research Evaluation*, 23 (1), 21–32.
- Powell-Jackson, T., King, J.J., Makungu, C., Spieker, N., Woodd, S., Risha, P. and Goodman, C. 2020. Infection prevention and control compliance in Tanzanian outpatient facilities: a cross-sectional study with implications for the control of COVID-19. *The Lancet Global Health*, 8(6), e780-e789.
- Robertson, L.J., Maposa, I., Somaroo, H. and 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.

- Rodriguez B.O. 2020. The Psychosocial Impact of Covi-19 on health care workers. Madrid, Spain, *International Journal*,46 (1).
- Sahu, P. 2020. Closure of universities due to coronavirus disease 2019 (COVID-19): impact on education and mental health of students and academic staff. *Cureus*, 12(4).
- South Africa, 2020. Department of Health Surveillance report, 14 April 2020.Update on Covid-19. Government website. Available at www.gov.za
- Stribling, J., Clifton, A., McGill, G. and de Vries, K. 2020. Examining the UK Covid-19 mortality paradox: Pandemic preparedness, healthcare expenditure, and the nursing workforce.
- Surrati, A.M.Q., Mansuri, F.M.A. and Alihabi, A.A.A., 2020. Psychological impact of the COVID-19 pandemic on health care workers. *Journal of Taibah University Medical Sciences*, 15(6), pp.536-543.
- Webster New World College Dictionary. Fifth edition. Wilson, J. and Parra, A. 2020. Associated press. Chicago tribune, 25 March 2020: Available at <https://www.chicagotribune.com>
- Woods, E.T., Schertzer, R., Greenfeld, L., Hughes, C. and Miller-Idriss, C. 2020. COVID-19, nationalism, and the politics of crisis: A scholarly exchange. *Nations and Nationalism*.
- World Health Organisation, 2020. Covid-19-advice for the public: Available at: <https://www.who.int/emergencies/disease/novel-coronavirus-2019/advices-for-the-public>: (accessed May 2020).
- World Health Organization, 2020. Report of the WHO-China Joint Mission on Coronavirus Disease 2019 (COVID-19)16-24 February 2020 (Internet). Geneva: World Health Organization: available at <http://www.who.int/docs/default-source/coronaviruse/who-china-joint-mission-on-Covid-19-final-report.pdf>.

Section B: Manuscripts/Papers/Articles

MANUSCRIPT 1: SYSTEMATIC LITERATURE REVIEW

The Psychosocial Impact of COVID-19 Pandemic among Nurses

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ABSTRACT

Background: Coronavirus (COVID-19) pose a massive threat to the well-being of all the members of the population in the country, but massively left the health care workers to deal with the fear and anxiety while caring for those infected by the virus.

Objective: The study aimed to explore and describe the psychosocial impact of COVID-19 on Nurses in Africa and developed countries such as China and the United States of America.

Methodology: The study employed a systematic review. The review investigated the question under discussion through specific scientific methods that critically assessed and synthesised the relevant literature for this study. The literature review explored both qualitative and quantitative research that were relevant to inform the objectives of this study. Ramadhani et al.'s systematic review steps were followed to reduce review errors and bias towards comprehensively reflecting the existing literature relevant to the current topic.

Results: Findings indicated that the advent of COVID-19 severely impacted the health and welfare of the nurses at work and off work. The psychological challenges of COVID-19 on healthcare professional requires serious attention from the relevant health authorities, such as the Ministry of Health and the government, even in the post-COVID-19 era.

Conclusion: Most of the systematically reviewed studies used empirical evidence to highlight the impact of COVID-19 among health professionals based on context. Future initiatives are required to monitor the psychological experiences of healthcare professionals as a result of their experiences. Facilities and programmes to nurture the health of healthcare workers are imperative.

Keywords: COVID-19; Hospital; Impacts; Nurses; psychosocial; Pandemic.

1. Introduction and theoretical background

The COVID-19 outbreak resulted in multiple devastating psychosocial consequences among healthcare workers (Rodríguez and Sánchez, 2020). Most of the psychosocial consequences were caused by the healthcare workers dealing directly with COVID-19-affected people. Most healthcare workers' situation requires adequate human resources and sufficient healthcare protective materials. The lack thereof these resources resulted in the increased suffering of healthcare workers, such as experiencing burnout syndrome, anxiety, stress, and Post-Traumatic Stress Disorder (PTSD). Quarantine has also intensified the psychosocial implications among healthcare workers, for it has been a handicap for most healthcare workers (Rodríguez and Sánchez, 2020). This explains why Cabarkapa, Nadjidai, Murgier and Ng (2020) indicated that future research priorities should be on the maintenance of the well-being of healthcare providers. The change needs to start with policymakers providing various support and protection to healthcare workers, especially during the outbreak of pandemics that threatens the lives of many such as COVID-19. These challenges require intimate attention to be mitigated through involving psychologists, education, enhanced awareness, and follow-ups on the therapeutic interventions (Cabarkapa, Nadjidai, Murgier and Ng, 2020).

The nurses and other healthcare professionals working in the frontline fighting against COVID-19 were identified to experience depressive symptoms and insomnia, unavoidable stress, fear, and anxiety about a contagious disease outbreak (Powell-Jackson, King, Makungu, Spieker, Woodd, Risha and Goodman, 2020). This was coupled with being quarantined. The fear of death or being infected by COVID-19 heightened the self-perception of the danger posed by COVID-19, which negatively affected the well-being of the nurses and all the healthcare professionals who worked tirelessly to fight the spread of COVID-19 (Hong, Ai, Xu, 2021). The challenge of COVID-19 stretched the healthcare system's capacity and increased the risk of infection among the healthcare workers (HCWs) themselves (Hong, Ai, Xu, 2021).

However, these psychological impacts differed from one context to another based on various reasons. For example, in some developing countries, especially in Africa, most frontline healthcare professionals lacked protective materials when dealing with patients with COVID-19. Thus, the psychological impact of COVID-19 on healthcare professionals varies depending on circumstances, environment and what support systems are available to them to support them. Therefore, this systematic literature review is carried out against this

background to identify the unique psychological impacts of COVID-19 among nurses at the selected Tertiary Hospital in a rural setting of Limpopo Province, South Africa.

Purpose of the review

This systematic literature review aims to identify the studies on the psychosocial impact of the COVID-19 pandemic on nurses and the various factors that were linked to the psychological effects among nurses.

Methodology

Systematic literature review refers to the scientific investigation of the question under discussion through specific scientific methods to critically assess and synthesise the literature relevant to the topic under discussion. This review examines qualitative and quantitative research on the identified topic. However, this systematic literature search excludes publications on books and newspaper articles to only includes scientific articles published through well-established journals. To reduce literature review errors and bias towards a comprehensive reflection of the existing literature, the systematic literature review steps by Ramadhani, Bartlett, Thielman, Pence, Kimani, Maro, Mwako, Masaki, Mmbando, Minja and Lirhunde (2014). See Figure 1 below. The steps that were followed in this systematic literature review are outlined below.

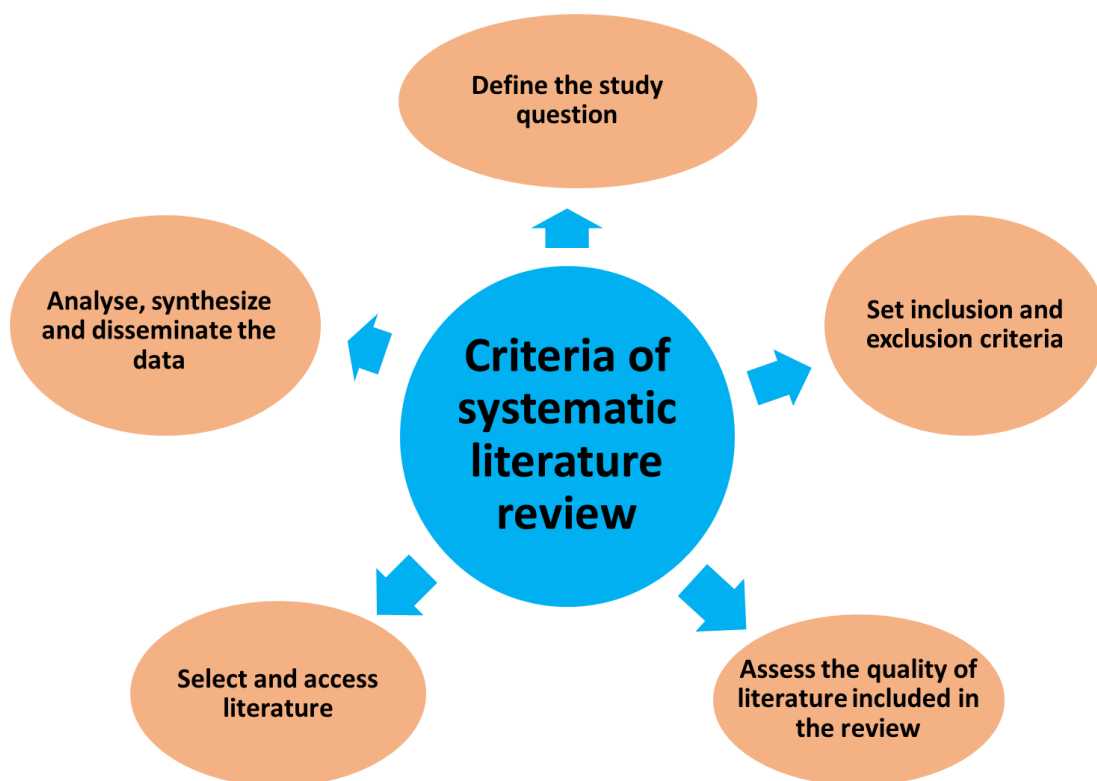


Figure 1: Systematic review steps adapted from Ramdhani et al. (2014).

Step 1: Defining the research questions

The first step entailed defining the questions guiding this study. The central question in this systematic literature review was to investigate the psychological impacts of COVID-19 among nurses. This question was critical in leading the scope of the literature to be included. The questions formulated to guide this study were done in consultation with the supervisors. The questions asked were: (1) What is the psychosocial impact of the Coronavirus (COVID-19) Pandemic on Nurses in Africa? (2) What are the mental health implications of COVID-19 among healthcare professionals (Nurses) in Africa? (3) What is the psychological impact of COVID-19 among nurses in Africa ? (4) What is the impact of the lack of COVID-19 protective equipment among healthcare professionals (Nurses) in Africa?

Step 2: Setting for inclusion and exclusion criteria

Only the studies that focused on the psychological impact of COVID-19 among nurses were relevant to the literature inclusion of the study. The literature search identified other studies that looked at the psychological implications of the healthcare profession on healthcare workers, especially nurses. This study's literature discussion excluded any psychological impact among nurses not because of COVID-19. The timeframe of the studies was not a concern since the COVID-19 outbreak is a recent phenomenon. Hence, the literature studies in this study fall within the timeframe from the year 2019 to 2021 current. The language was another criterion used to select the studies discussed under literature in this study. Only the studies published in English were included in this literature since the researcher could understand English apart from other languages identified to have been published in other languages, such as Chinese. However, other studies were published in Chinese but with the English version. Those were also considered for discussion in the literature of this study.

The Preferred Reporting Item for Systematic Reviews and Meta-Analysis (PRISMA) provided different guidelines on retrieving information through systematic review and meta-analysis. The researcher followed the PRISMA steps to search and identify the studies that are relevant to this study. The researcher primarily made use of the research topic on the search engines framed as the psychosocial impact of the Coronavirus (COVID-19) Pandemic on Nurses, followed by the subtopics: the psychological effects of COVID-19 among nurses in Africa and the psychological impact of COVID-19 among nurses in South Africa, respectively. The studies identified through the database search engines were 125 English versions and 55 Chinese, Spanish and Portuguese. Twenty studies were 20 studies identified as in both English and either Spanish or Chinese. This study used 20 studies; full-text articles assessed for eligibility to be included in the literature study for this study. The other 125 literature studies

were excluded from the literature discussion for this study because the researcher had only access to the abstracts of these studies and not access to the full text. The studies included were those that the researcher could have access to the abstracts and the full texts for the studies in English.

The time frame was not a concern in this study as the study's literature was strictly about the COVID-19 psychological impact on nurses from the outbreak of COVID-19 in 2020. Hence all the studies included to be part of this literature were from the years 2020 to 2021 current. The subtopics included in the literature search were to broaden the literature search and include all the relevant studies.

Step 3: Conducting a literature search

Systematic literature searching is a critical element of the systematic review process that evolves the systematic search of studies. The systematic literature review aims for a transparent study identification and fully informs the readers on identifying, selecting, and reporting the previous research findings (Templier and Pare, 2018). The researcher used electronic search engines to gather the literature available within the scope of this study. The electronic search engines used are the University of Venda EBSCOhost, PubMed, Google Scholar and Science Direct. The research topic and aim of the study guided the literature from these search engines. The sub-questions used in the search engines were framed from the research topic. The topics were crafted to gather the psychological impact of the COVID-19 pandemic on nurses in South Africa and the rest of the world. Apart from the identified questions used to search for the literature, the researcher used keywords from the topic to gather the literature from the above electronic search engines. The keywords from the research topic were used to construct questions to guide the literature review search.

Step 4: Assessing the quality of literature included in the review

The researcher employed the Critical Appraisal Skills Programme (CASP) to appraise the selected studies to be included in the research. Critical Appraisal Skills Programmes (CASP) are important for researchers who wish to influence decisions or raise quality in the healthcare system (Chatfield, 2018). Sarkies, Bowles, Skinner, Haas, Lane and Haines (2017) observed that CASP is important in health policy development, implementation and management decision-making. The researchers employed the cohort studies checklist in assessing the appropriateness of the studies to the purpose of this research was guided by the research title and the two subtopics constructed from the title. Table 1 below indicates the studies selected for this study, starting from international studies, then Africa (developing countries), and South Africa. The literature review also indicated that since COVID-19 is a new

phenomenon, most of the studies are cross-sectional, portraying the current experiences of the nurses as it occurs during covid-19 as opposed to future patterns and long-term psychological impact of COVID-19 (longitudinal studies). Figure 2 below shows how the data was synthesized and analysed.

Step 4 The PRISMA data analysis, synthesising, and dissemination

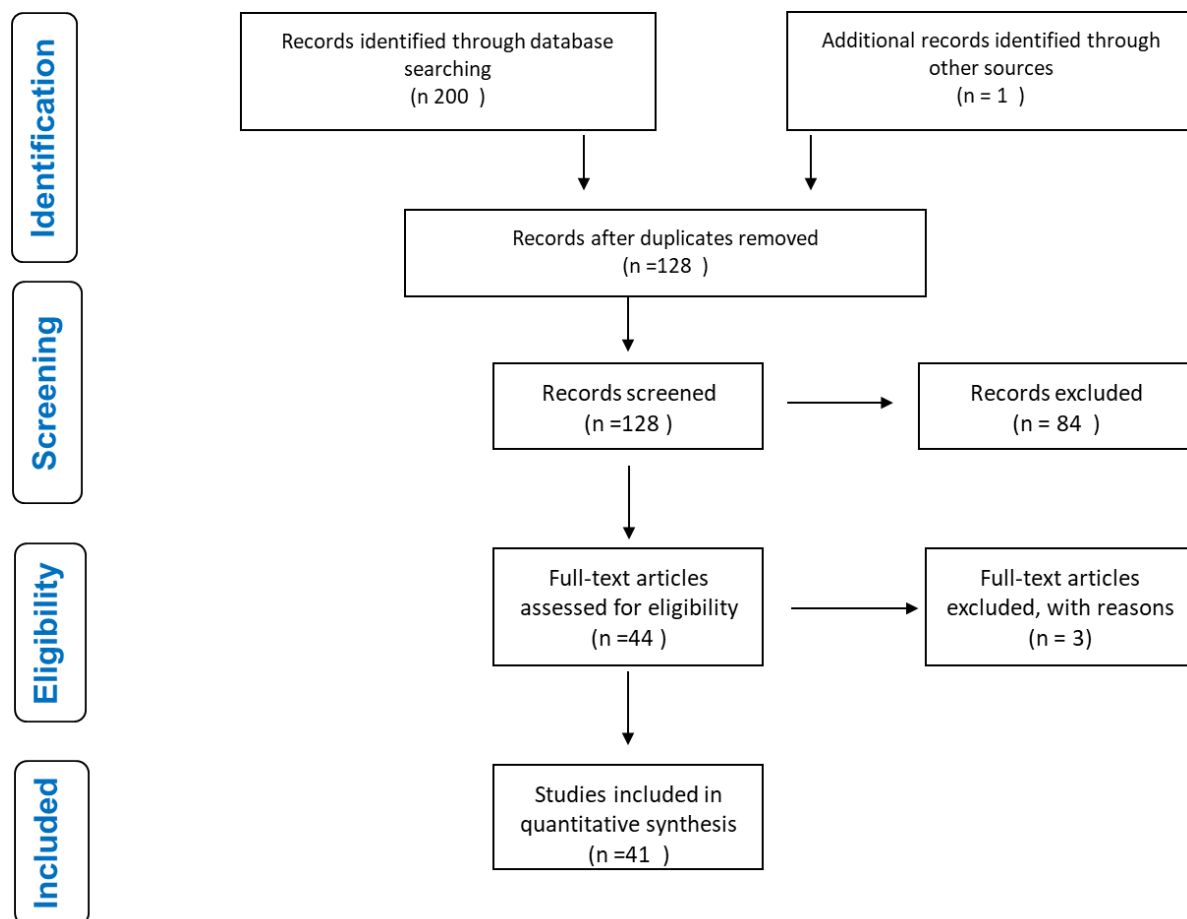


Figure 2: Adapted Flow chart of the literature search for the included and excluded studies.
Source: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009)

The initial literature review search yielded 200 research articles. However, only 41 scientific research articles were the ones that remained for a full investigation, synthesis and analysis after some articles were disregarded because of repetition, and others not being relevant after a deep review beyond the reading of the abstract. The researcher started identifying the cohort studies published internationally regarding the psychological impact of COVID-19 among nurses. This was followed by a search focused on the psychological impacts of COVID-19 among nurses in African countries (developing countries). Lastly, the literature search focused on the publication in South Africa regarding the psychological impacts of COVID-19 among nurses. The narrowing down of the literature search from the international

framework to Africa and then South Africa was guided by the title of the research and the subtopics that were created following the title of this research.

The researchers stored the literature gathered in a file on a computer. The studies were listed under subtopics, such as international studies; African studies; and South African studies, for the researcher to identify and categorise the studies. This also assisted the researcher to be able to identify and compare differences and similarities of experiences of nurses because of COVID-19 concerning context.

Selecting and deselecting information

Only the studies that focused on the psychological impact of COVID-19 among nurses were selected to form part of the literature review for this study. Any psychological impact among nurses not because of COVID-19 were excluded from the literature discussion of this study. The language was another criterion used to select the studies discussed under literature in this study. Only the studies that were published in English were included in this literature since the researcher could understand English apart from other languages that were identified to have been published in other languages, such as Chinese. The research topic and the subtopics were used to search for the relevant literature on the literature search engines.

Expanding the search using the search modes

Through the literature search, other studies were identified that also looked at the psychological impacts of the healthcare profession on healthcare workers, especially nurses. The researcher followed the PRISMA steps to search and identify the studies that are relevant to this study. The researcher primarily made use of the research topic on the search engines framed as the psychosocial impact of the Coronavirus (COVID-19) Pandemic on Nurses, followed by the subtopics: the psychological impact of COVID-19 among nurses in Africa and the psychological impact of COVID-19 among nurses in South Africa, respectively. Other studies identified stress as the psychological impact that healthcare professionals experience because of their job. These studies also discussed nurses' experiences with COVID-19.

The studies selected for this study were a mix of qualitative and quantitative research approaches. The researcher used qualitative analysis to analyse and synthesize the data.

Communication Phase

The study's findings are presented without following any chronological order of the year when the studies were published or in alphabetical order. The literature is discussed following the

sub-themes that the researcher constructed to guide the literature search. Each study is discussed following their discovery on the literature search engines by the researcher. The literature discusses the studies' methods used, the unity of analysis, the conclusion and implications of each study and how the study relates to the current research topic.

Theme 1: The psychosocial impact of the Coronavirus (COVID-19) Pandemic on Nurses

Rodríguez and Sánchez (2020) observed that the COVID-19 outbreak resulted in multiple devastating psychosocial consequences among healthcare workers. Most of the psychosocial consequences were caused by the healthcare workers dealing directly with COVID-19-affected people. Most healthcare workers' situation requires adequate human resources and sufficient healthcare protective materials. The lack thereof these resources resulted in the increased suffering of healthcare workers, such as experiencing burnout syndrome, anxiety, stress, and Post-Traumatic Stress Disorder (PTSD). Quarantine has also intensified the psychosocial implications among healthcare workers, for it has been a handicap for most healthcare workers (Rodríguez and Sánchez, 2020). This explains why Cabarkapa, Nadjidai, Murgier and Ng (2020) indicated that future research priorities should be on the maintenance of the well-being of healthcare providers. The change needs to start with the level of policymakers to provide a variety of support and protection to healthcare workers, especially during the outbreak of pandemics that threatens their lives. These challenges require intimate attention to be mitigated through involving psychologists, education, enhanced awareness and follow-ups on the therapeutic interventions (Cabarkapa, Nadjidai, Murgier and Ng, 2020).

The frontline workers' response to COVID-19 was a complex experience (Aughterson, McKinlay, Fancourt and Burton, 2021). The experience was mixed with the battle for survival, apart from the professional responsibility to save patients. This has led to huge psychological morbidity among frontline healthcare providers (Aughterson, McKinlay, Fancourt and Burton, 2021). The nurses and other healthcare professionals working in the frontline fighting against COVID-19 were identified to experience depressive symptoms and insomnia, unavoidable stress, fear, and anxiety about a contagious disease outbreak. This was coupled with being quarantined. The fear of death or being infected by COVID-19 heightened the self-perception of the danger posed by COVID-19, which negatively affected the well-being of the nurses and all the healthcare professionals who worked tirelessly to fight the spread of COVID-19 (Hong, Ai, Xu, 2021).

Healthcare providers play an essential role in healthcare by providing care to patients and monitoring their recovery progress within and outside healthcare facilities when the patients are taken out of the healthcare facilities to recover while with their families. This role was also increased with the advent of COVID-19, requiring healthcare providers to ensure that infection of COVID-19 is not spread to other patients within the healthcare facilities and from one individual to another through prevention and control measures that are implemented and adhered to (Powell-Jackson, King, Makungu, Spieker, Woodd, Risha and Goodman, 2020). The overwhelming burden of COVID-19 stretched the healthcare system's capacity and increased the risk of infection among the healthcare workers (HCWs) themselves. The need to stop the spread of COVID-19 has exerted much pressure on healthcare providers (Hong, Ai, Xu, 2021). This has resulted in health-related problems among healthcare practitioners emanating from the lack of sleep, the fear of being infected with COVID-19 and also infecting their family (Hong, Ai, Xu, 2021).

The 2021 study by Hong, Ai and Xu (2021) in China observed that anxiety symptoms were prevalent (46.04%); depression (44.37%); insomnia (28.75%); and psychological problems (56.59%) among the healthcare provider who participated in the front-line working with the patients with COVID-19, compared to the healthcare providers that did not participate in the front-line work at the same time. This study indicated the implication of COVID-19 among healthcare workers to not only be a concern of immediate risks such as being infected by the virus but also extend to the psychological and health state of the frontline healthcare workers (World Health Organisation (WHO) (2020). Thus, the findings of this study indicate the need for prioritising the health of frontline healthcare workers during the outbreak of COVID-19.

Using the retrospective analysis of 2,842 healthcare workers with a known status of COVID-19, the study by Kim, Nachman, Fernandes, Meyers, Taylor, LeBlanc, and Singer (2020) compared the impacts of COVID-19 infections among healthcare workers and non-healthcare workers, looking on personal health, characteristics, and the outcomes. Healthcare workers had lower tachypnoea frequencies (6%), hypoxemia at 8%, 20% bilateral opacities on imaging and 3% lymphocytopenia compared to 20% lymphocytopenia in non-healthcare workers. Although the study indicated that the younger healthcare workers with a known positive status of COVID-19 had a less severe illness and were less likely to be admitted, the general health-related problems of COVID-19 from healthcare workers signify an emanant challenge and health risk to healthcare workers.

According to the report released by the World Health Organisation (WHO) (2020) on surveillance of COVID-19 cases, China indicated that 3,300 healthcare workers were infected by the Virus, which constituted (4% of the 81,285 reported infections). On 25 March 2020,

Spain had nearly 6,500 infected healthcare workers, accounting for about 13.6% of the country's 47 600 cases of infected individuals by COVID-19 (Wilson & Parra: Chicago Tribune Breaking News: 25 March 2020). Thus, as nations continue to monitor the COVID-19 infection rates, there is a more serious precaution to monitor the health of the healthcare professional to avoid a situation where the patients need care the same as the healthcare professionals.

Chirico, Nucera and Magnavita (2020) observed that protecting healthcare workers should be a priority as a part of the protective measures to prevent them from being infected and spreading COVID-19. The same study indicated that the lack of awareness and training, shortage of Personal Protective Equipment (PPE) and the lack of point-of-care diagnostic tests are some of the most important sources of COVID-19 infections and spread among healthcare workers in Italy. These problems have resulted in the infection of 12,252 healthcare workers in Italy as of April 2020. The healthcare workers in Italy by April 2020 comprised 10% of Italy's COVID-19 cases, leaving 80 medical doctors and 25 nurses dead of COVID-19. The study also revealed that the spread of COVID-19 among healthcare workers was fuelled by underestimating the real impact of COVID-19 on the healthcare COVID-19 pandemic. The same study indicated that SARS-CoV-2 has a high transmissibility rate in indoor environments and asymptomatic patients admitted to hospitals without respiratory symptoms, which threatens unprotected healthcare workers. The study also indicated that the healthcare institutes such as hospitals could amplify the viral transmission of COVID-19.

The study by Schwartz, Achonu, Buchan, Brown, Lee, Whelan, Wu and Garber (2020) observed that 17.5% of healthcare workers who were COVID-19 infected in Ontario, Canada, and 20.2% of those were nurses. The mortality level among healthcare workers was 0.2% compared to 10.5% of non-healthcare workers. The healthcare workers (74.1%) mostly suffered from direct exposure to individuals with confirmed cases of COVID-19. The healthcare workers were at a higher rate (5.5%) of new infection cases than non-healthcare workers. The same study identified that the high infection rate among healthcare workers had challenging implications of probable 9.8% secondary household transmissions and 3.6% acquisitions. Thus, the same study also indicated that it is imperative to protect healthcare workers from COVID-19 to maintain a safe and functioning healthcare system. Interestingly, the study discovered that the risk of transmitting COVID-19 to family members had become a source of stress for many healthcare workers. The study also indicated a need to protect healthcare workers by providing appropriate personal protective equipment and ensuring that COVID-19 protective measures such as social distancing from significant others are important.

The study by Sheraton, Deo, Dutt, Surani, Hall-Flavin and Kashyap (2020) investigated the psychological impacts of COVID-19 using a systematic review, comparing the incidences of psychological issues during COVID-19. The compared issues include insomnia, occupational stress, Post Traumatic Stress Disorder, depression and anxiety among healthcare and non-healthcare workers. The results indicated a high level of individual insomnia among healthcare workers compared to non-healthcare workers. What is interesting to note is that the study indicated that despite the high-level indications of psychological-related issues, the healthcare workers and non-healthcare workers in this study suffered an equal measure except for insomnia. The study indicated that psychosomatic manifestations were commonly reported as predictive of worse outcomes. Therefore, the same study suggested improved access to mental health interventions that target the prevention of psychological concerns and early therapeutic intervention, strict implementation of staff safety standards and guidelines and a balanced workload.

Hacimusalar, Kahve, Yasar and Aydin (2020) observed the effects of the COVID-19 pandemic on anxiety and hopelessness levels among healthcare workers and non-healthcare workers in Turkey using the State-Trait Anxiety Inventory (STAI) and Beck Hopelessness Scale to participants online. The findings revealed that more healthcare workers were suffering from anxiety and hopelessness than non-healthcare workers. The other unique identification of this study was that nurses experience anxiety more than doctors and other healthcare professionals. The study also indicated that the levels of anxiety and hopelessness were considerably higher among female nurses living with high-risk individuals at home, those with decreased income and those with difficulty caring for their children. The results also indicated that anxiety levels are predictors of hopelessness. This anxiety was found to be caused by increased working hours. The study concluded that healthcare workers were much more affected psychologically because of the COVID-19 pandemic compared to the general society. Thus, there is a need for psychological interventions for healthcare professionals, especially nurses.

Theme 2: Assessing the mental health implications of COVID-19 among healthcare professionals (nurses)

The study by Sampaio, Sequeira and Teixeira (2020) observed that the nurses' anxiety, stress, symptoms of depression and quality of sleep were consistent with the impacts of the COVID-19 pandemic outbreak. This was caused by the fear of being exposed and infected by COVID-19 and of infecting others. This study revealed that the higher the fear of being infected was related to a higher stress level, the higher signs of depression and anxiety. The study did not only observe the immediate health caused by COVID-19 but also envisaged the

psychological concern. The need for further studies to continuously investigate the relationship between the symptoms of depression, stress and anxiety to COVID-19 to certain these findings was emphasised.

The paper by Marshall (2020), a self-experienced study writing from a nurse's perspective, indicated that COVID-19 robbed the nurses of getting to know more about their patients. It required a mind and skill set to shift from the healthcare workers to deal with the challenges posed by COVID-19. The fear of being infected or infecting other with COVID-19 have severely impacted the mental health of nurses to the extent that adjusting to normal routines with new thoughts and replacing the pandemic thoughts might not be easy for many nurses and healthcare professional alike. Marshall (2020) indicated that COVID-19 had consumed most of the nurses with emotions, anxiety, depression, fear, insomnia, increased use of alcohol and difficulty with significant others and children. The study cautions on the need to monitor the nurses' stress levels and mental health to avoid Acute Stress Disorder and Post Traumatic Stress Disorder (PTSD).

From self-experience, the study indicated that healthcare professionals are bound to accept the inherent risks that come with their responsibilities. The COVID-19 pandemic has seriously threatened the health of most if not all, healthcare professionals, which resulted in some healthcare professionals seeking healthcare themselves for their emotional well-being (Marshall, 2020). The study indicated that there is a need for healthcare centres to understand the importance of providing emotional health through the provision of free counselling and other platforms that allows healthcare workers to heal. The advent of COVID-19 was also accompanied by the development of mobile applications targeting healthcare workers to access services such as yoga, meditation, and other self-care programmes (Marshall, 2020). The same study by Marshall (2020) explained the experiences of healthcare workers as turbulent, which requires healthcare professionals to consider the long-term benefits of protecting their mental health during and post the pandemic period.

The study by Kim, Quiban, Sloan and Montejano (2021) examined the impact of different factors on nurses' mental health during the COVID-19 pandemic. The findings reveal that most nurses (80.1%) reported high-stress levels. In comparison, others (43%) reported that they were experiencing moderate levels of depression, and (26%) reported that they were experiencing severe anxiety and depression. The study also reveals a positive correlation between COVID-19 patient care with moderate and/ or severe anxiety. Quarantine was also associated with moderate and/ or severe depression among healthcare workers. The same study also indicated that spirituality, high resilience, and family functioning appear to be good

coping mechanisms for nurses to limit the levels of stress, anxiety, and depression during the COVID-19 pandemic (Kim, Quiban, Sloan and Montejano, 2021).

Khan, Mamun, Griffiths and Ullah (2020) observed that mental and emotional issues have been among the most public health concerns worldwide because of the COVID-19 pandemic. This mental and emotional health affected everyone, including the healthcare practitioners themselves, and it was caused mainly by the fear of being infected or death from the virus. The study by Khan, Mamun, Griffiths and Ullah (2020) indicated that many healthcare workers suffered from elevated anxiety, confusion, post-traumatic symptoms, and anger.

According to Ahorsu, Lin, Imani, Saffari, Griffiths and Pakpour (2020), among the factors that contributed to the frustration, sadness, fear, feelings of helplessness, nervousness, and loneliness were the measures to ensure self-isolation, quarantine, false information, spatial distance, and socio-economic discord. These increased levels of stress, rage, and bewilderment may result in attempts at suicide and thoughts of suicide (Bhuiyan, Sakib, Pakpour, Griffiths and Mamun, 2020). According to Ahorsu, Lin, Imani, Saffari, Griffiths, and Pakpour (2020), a portion of the domestic violence cases that tripled during the COVID-19 lockdown are linked to the emotional and psychological suffering experienced by all the various cohorts and categories of the population, including healthcare workers and other vulnerable groups.

Using a sample of nurses in the United States of America, Arnetz, Goetz, Sudan, Arble, Janisse, and Arnetz (2020) determined the relationship between the availability of proper personal protection equipment (PPE) and outcomes related to mental health. The study used an online survey to collect data from 695 nurses in Michigan and performed multivariable logistic regression analysis to find characteristics linked to symptoms of mental illness. The results showed that 24.9% of nurses said they did not have enough access to personal protective equipment (PPE), and these nurses were more likely to have depression, anxiety, and post-traumatic stress disorder symptoms (Arnetz, Goetz, Sudan, Arble, Janisse and Arnetz, 2020). The study suggests that in a crisis or pandemics like COVID-19, healthcare institutions and organizations should invest in managing healthcare workers' mental health issues through education and the sufficient availability of PPE.

Another study by Tsamakias, Rizos, Manolis, Chaidou, Kypouropoulos, Spartalis, Spandidos, Tsiptsios and Triantafyllis (2020) observed that despite the public health crisis of the COVID-19 pandemic, the nurses were at a high risk of experiencing a high level of emotional and psychological impacts. The same study indicated that during the initial stages of the COVID-19 pandemic, there was unparalleled stress among the nurses and the

associated increased psychological morbidities in Greece (Tsamakis et al., 2020). Thus, there is a need for measures to minimise the psychological pressure on those at the frontline of any pandemic or healthcare crisis in an attempt to avoid a double tragedy (Tsamakis et al., 2020).

The study by Sasaki, Kuroda, Tsuno and Kawakami (2020) compared the longitudinal change in the mental health of non-healthcare workers and healthcare workers under COVID-19 in Japan. The data was derived from the prospective online cohort study of 1448 full-time employees in the healthcare profession. Through a self-administered online questionnaire that was focused on assessing the participants' fear of COVID-19, physical symptoms, and psychological distress, the findings revealed that psychological distress, including subscales of fatigue, anxiety and depression and the fear of COVID-19, was statistically high among the healthcare workers compared to the non-healthcare workers. Thus, the study revealed that healthcare workers should be a target of mental and psychological healthcare services and programmes more than non-healthcare workers during the COVID-19 outbreak.

At private care homes and domiciliary care agencies in the United Kingdom, Nyashanu, Pfende, and Ekpenyong (2020) observed the causes of mental health issues among frontline healthcare workers during the COVID-19 pandemic (UK). According to the study, frontline healthcare staff were poorly prepared for the COVID-19 pandemic, which also directly affected non-healthcare employees. The study found that the fear and worry of contracting COVID-19 and spreading it to others, the lack of recognition between National Health Services (NHS) and social care, unsafe hospital discharges, lactation, and some aspects of Interpretive Phenomenological Analysis (IPA) and the Silence Framework (SF) were the main causes of mental health problems among healthcare workers in private care homes and domiciliary care agencies. Due to this, it is necessary to safeguard healthcare personnel from COVID-19 infections and create secure working conditions.

The literature showed the implications of the COVID-19 outbreak on healthcare workers from various levels and different magnitudes. It showed that much like any other individual within societies, or even more, the healthcare workers experienced difficulties psychologically and mentally because of the COVID-19 pandemic (Aughterson, McKinlay, Fancourt and Burton, 2021). The main mental and psychological concerns were shown to be insomnia, pressure, long working hours, fear and worry of being infected and, in turn, infecting the family members and friends, challenges regarding the lack of protective equipment, lack of sufficient staff, and abiding by the COVID-19 preventive measures, among others (Ahorsu, Lin, Imani, Saffari, Griffiths and Pakpour, 2020; Bhuiyan, Sakib, Pakpour, Griffiths and Mamun, 2020; Marshall, 2020; Stribling, Clifton, McGill and de Vries, 2020; WHO, 2020). However, these

psychological issues and concerns are largely relative to the context and subjects under investigation. Therefore, this research will explore and investigate the unique experiences of the healthcare workers (nurses) in a selected rural healthcare institution in Limpopo Province, South Africa, on the psychological impact of COVID-19.

Theme 3: The psychological impact of COVID-19 among nurses in Africa

The World Health Organisation (WHO) (2020) observed that in Africa, as of 9 September 2020, A total of 249 COVID-19 cases of COVID-19 infections among healthcare providers were recorded, adding to the already existing number of healthcare professionals infected individuals with Kenya at 105; Uganda 52; Namibia 38; Mozambique 20; Ethiopia 12; Zambia 12; Eswatini 9; Mauritius 1; and South Africa retrospectively reported the highest number of COVID-19 infections among healthcare workers at 1 519. To the researchers' knowledge, it could be said that these figures might have multiplied and, in some parts, tripled. However, South Africa remains the most affected, with a total of 27 360 healthcare workers, which is approximately 65% of the total population of healthcare workers in South Africa (WHO, 2020). These challenges and the spread of COVID-19 among healthcare professionals affect most healthcare workers' psychological and mental health (Sandesh, Shahid, Dev, Mandhan, Shankar, Shaikh and Rizwan, 2020). Usher, Durkin and Bhullar (2020) observed that healthcare workers' mental health and psychological effects are linked to the fear and worry of being infected by COVID-19 and, subsequently, infecting their families.

South Africa had also been topical, with the number of infections and death toll being one of the highest in the world. This also affected the healthcare providers and the high mortality levels due to COVID-19 (Stribling, Clifton, McGill and de Vries, 2020). As of 10 June 2020, South Africa's Health Care Workers were found to be increasingly becoming infected with COVID-19, as hospital beds begin to fill up with a total of cases surpassing 55 000. As of 2 February 2021, the cumulative number of COVID-19 cases identified in South Africa was 1 4 58 985 with 2649 new cases. Out of the reported cumulative data, Limpopo accounts for 58 340 COVID-19 Cases (National Institute for Communicable Disease, 2021). These alarming figures put everyone in a panic mode, instilling fear of death and worry in all, including healthcare professionals (Keubo, Mboua, Tadongfack, Tchoffo, Tatang, Zeuna, Noupoue, Tsoplifack and Folefack, 2021).

Healthcare's response to the pandemic depends upon a mentally and physically healthy workforce (Robertson, Maposa, Somaroo and Johnson, 2020). The mental and physical weakness of the healthcare providers will mean weak approaches to healthcare problems. The COVID-19 outbreak caused a lot of mental distress and mental trauma among most

healthcare professionals, with most of the nurses being at the forefront risk of being infected by COVID-19. The nurses are the first to receive and assess the patients and are too involved with the patients compared to the Doctors. The implications of this are not only on the healthcare workers being infected by COVID-19 but also on experiencing depression, anxiety, post-traumatic stress and other mental health conditions (Robertson, Maposa, Somaroo and Johnson, 2020).

Theme 4: Impact that the lack of COVID-19 protective equipment has on healthcare professionals (nurses)

The advent of the COVID-19 pandemic got most nations not ready to deal with the implications of its magnitude. Developed countries quickly adjusted and sought alternatives to deal with the problem. However, this has not been the case with most developing countries and the underdeveloped world. In most of the developing world, healthcare professionals are not protected from COVID-19, with nurses not having protective clothes, such as masks, gloves, coats, and boots (Chersich, Gray, Fairlie et al., 2020). This has been the case with most African countries, and Southern Africa is not excluded. For example, in Zimbabwe, healthcare professionals were constantly on strike for the government's failure to recognise the rights of healthcare professionals as human beings. The lack of protective equipment against COVID-19 infections among healthcare workers has an overarching implication, and it has become a source of stress for many healthcare workers (Schwartz, Achonu, Buchan, Brown, Lee, Whelan, Wu and Garber, 2020). The stress and discomfort among healthcare workers are also on the potential to infect their significant others when they are off work (Schwartz, Achonu, Buchan, Brown, Lee, Whelan, Wu and Garber, 2020).

The World Health Organisation (WHO), United Nations International Children's Emergency Fund (UNICEF), and other governments continue to work together tirelessly to respond to the COVID-19 pandemic and in search of the most appropriate vaccine (WHO, 2020). This, among other things, has resulted in the development of safe and effective vaccines (WHO, 2020). South Africa received its first load of COVID-19 vaccine named Johnson & Johnson in February 2021. It was estimated that 1.2 million frontline healthcare workers would be vaccinated during the first phase of the vaccine rollout. However, this has not yet been fulfilled, with some of the vaccines proclaimed expired. With the vaccine's arrival in the country, Limpopo Province plans to vaccinate 40 000 healthcare workers in three weeks (The New Humanitarian, 2021). These initiatives are somehow being disturbed by the vaccine shortages, logistics, corruption and pragmatism and the government's opaqueness in its response to COVID-19 (The New Humanitarian, 2021).

Zhang, Zhou, Tang, Wang, Nie, Zhang and You (2020) investigated the relationship between good practices of protective measures against COVID-19 infections and the knowledge, practises, and attitudes among healthcare workers in China. The findings revealed that sufficient knowledge of COVID-19 among healthcare workers was correlated to the fear of self-infection with the virus, and 89.7% of these healthcare workers followed correct practices regarding COVID-19 protective measures. The same study revealed that knowledge levels, work experience and job category influenced the healthcare workers' attitudes and practices concerning COVID-19. From the discussions and analysis of this study, it appears that knowledge, work experience and educational attainment are critical towards good practices and following the protective measures against COVID-19 infection among healthcare workers.

Balachandar, Mahalaxmi, Kaavya, Vivekanandhan, Ajithkumar, Arul, Singaravelu, Kumar and Devi (2020) indicated the primary spread of COVID-19 was through droplets of saliva or discharge from the nose. Hence, an urge to manufacture a great number of masks to prevent any aerosol with the microbes and the subsequent development of an efficient viral inactivation system by exploring active compounds from naturally occurring medicinal plants and infusing them into nanofiber-based respiratory masks (Balachandar, Mahalaxmi, Kaavya, Vivekanandhan, Ajithkumar, Arul, Singaravelu, Kumar and Devi, 2020). With all these strategic measures to ensure that healthcare workers and the public are safe from the infection and the spreading of COVID-19, the paper proposed the development of a much safer mask (fibrous filtration with three-layered masks using the compounds from medicinal plants for viral deactivation. The study indicated that these masks would be beneficial to healthcare workers in preventing the transmission of airborne pathogenic aerosols and controlling diseases without vaccination (Balachandar, Mahalaxmi, Kaavya, Vivekanandhan, Ajithkumar, Arul, Singaravelu, Kumar and Devi, 2020).

According to Gómez-Salgado, Domnguez-Salas, Romero-Martn, Ortega-Moreno, Garca-Iglesias, and Ruiz-Frutos (2020), the COVID-19 control measures themselves have had a significant psychological influence on the medical staff. With this dissatisfaction and psychological threat, there was confusion about how to treat the illness, emotional stress, risk of exposure, a lack of resources, and confusing procedure changes. According to the study, a feeling of coherence may aid healthcare professionals in seeing the situation as manageable and understood. To help professionals effectively practice and cope with COVID-19 protective measures, this study by Gómez-Salgado, Domnguez-Salas, Romero-Martn, Ortega-Moreno, Garca-Iglesias, and Ruiz-Frutos (2020) found that the measures for protecting healthcare workers from COVID-19 infection need to be accompanied by the

psychological distress programs. This is similar to the study by Zhu, Xu, Wang, Liu, Wu, Li, Miao, Zhang, Yang, Sun and Zhu (2020), indicating that measures to prevent psychological and emotional distress from COVID-19 among healthcare workers are necessary the practical steps, including wearing masks and social distancing.

Kiely, Moloney, O'Sullivan, Eustace, Gallagher and Bourke (2021) observed that healthcare workers must frequently wash their hands and use Personal Protective Equipment (PPE) to prevent infection and the spread of COVID-19. However, the problem is that these measures and practices are causing adverse effects on the skin, such as irritant contact dermatitis among healthcare professionals in Ireland. The study revealed that 76.47% of the participants reported that it had occurred at one time or another, they had experienced hand irritation, and 75.37% experienced dry skin. The study concluded that there is a need to promote awareness of COVID-19-related irritant contact dermatitis by highlighting prevention and treatment for frontline healthcare workers, apart from only emphasising wearing protective overalls, masks, and gloves.

Discussion

The literature review indicated that the advent of Covid-19 had a severe impact on the health and welfare of the nurses at work and at home (Arnetz, Goetz, Sudan, Arble, Janisse & Arnetz, 2020; Balachandar, Mahalaxmi, Kaavya, Vivekanandhan, Ajithkumar, Arul, Singaravelu, Kumar & Devi, 2020; WHO, 2020). The challenges of COVID-19 on healthcare professional requires serious attention from the relevant health authorities such as the Ministry of Health and the government. Facilities and programmes to nurture the health of healthcare workers are imperative. For example, the attention of the social workers at the healthcare facilities should also be prioritised by healthcare professionals apart from only focusing on the patients.

The results also indicated that the number of infected healthcare professionals in Africa is high compared to the Western or developed countries. This implies that the countries experiencing socioeconomic and political challenges by the advent of COVID-19 were severely affected (Hacimusalar, Kahve, Yasar & Aydin, 2020). These developing countries, especially in Africa, were constrained regarding the resources and human capital to contain the spread of COVID-19 (Chersich, Gray, Fairlie, Eichbaum, Mayhew, Allwood, English, Scorgie, Luchters, Simpson & Haghighi, 2020). Hence, most developing countries, mostly in Africa, relied on humanitarian aid and assistance from developed countries, mostly from the West. The literature indicated that the impacts of COVID-19 were felt differently from one country to country and from context to context, with varying proportions of challenges

depending on how it is being approached – the mental, psychological, social and economic impact.

Conclusion

Most of the systematically reviewed studies used empirical evidence to highlight the impact of COVID-19 among health professionals based on context. Different reasons and factors were presented to have influenced how health professionals were affected across the globe. For example, some health professionals in most developed countries were worried about them being the agents of spreading COVID-19 to their families and loved ones and them experiencing long-working hours compared to the pre-COVID-19 era. On the other hand, most developing countries, especially in Africa, were psychologically affected because some lacked protective materials to prevent contracting and spreading COVID-19. Apart from the high availability demands and straining schedules and shifts, the fear of contracting COVID-19 remained a dominant factor contributing to psychological issues. Most of the studies did not show how health professionals can overcome the challenges as the psychological impact caused by COVID-19. There was also less effort to show the relationships between the findings from context to context. The rural South African setting was less investigated of health professionals' experiences during COVID-19. This necessitated the need for this research to investigate the impact of COVID-19 among nurses in the rural setting in Limpopo Province of South Africa.

References

- Chatfield, S.L. 2018. Considerations in qualitative research reporting: A guide for authors preparing articles for Sex Roles. *Sex Roles*, 79(3), 125-135.
- Sarkies, M.N., Bowles, K.A., Skinner, E.H., Haas, R., Lane, H. and Haines, T.P. 2017. The effectiveness of research implementation strategies for promoting evidence-informed policy and management decisions in healthcare: a systematic review. *Implementation Science*, 12(1), 1-20.
- Templier, M. and Pare, G. 2018. Transparency in literature reviews: an assessment of reporting practices across review types and genres in top IS journals. *European Journal of Information Systems*, 27(5), 503-550.
- Ahorsu, D. K., Lin, C. Y., Imani, V., Saffari, M., Griffiths, M. D., & Pakpour, A. H. 2020. The fear of COVID-19 scales: Development and initial validation. *International Journal of Mental Health and Addiction*.

- Arnetz, J.E., Goetz, C.M., Sudan, S., Arble, E., Janisse, J. and Arnetz, B.B. 2020. Personal protective equipment and mental health symptoms among nurses during the COVID-19 pandemic. *Journal of Occupational and Environmental Medicine*, 62(11), pp.892-897.
- Aughterson, H., McKinlay, A.R., Fancourt, D. and Burton, A. 2021. Psychosocial impact on frontline health and social care professionals in the UK during the COVID-19 pandemic: a qualitative interview study. *BMJ open*, 11(2), e047353.
- Balachandar, V., Mahalaxmi, I., Kaavya, J., Vivekanandhan, G., Ajithkumar, S., Arul, N., Singaravelu, G., Kumar, N.S. and Devi, S.M. 2020. COVID-19: emerging protective measures. *European review for medical and pharmacological sciences*, 24(6), 3422-3425.
- Bhuiyan, A. K. M. I., Sakib, N., Pakpour, A., Griffiths, M. D., and Mamun, M. A. 2020. COVID-19 related suicides in Bangladesh due to lockdown and economic factors: Case study evidence. *International Journal of Mental Health and Addiction*.
- Cabarkapa, S., Nadjidai, S.E., Murgier, J. and Ng, C.H. 2020. The psychological impact of COVID-19 and other viral epidemics on frontline healthcare workers and ways to address it: A rapid systematic review. *Brain, behavior, & immunity-health*, 100144.
- Chersich, M.F., Gray, G., Fairlie, L., Eichbaum, Q., Mayhew, S., Allwood, B., English, R., Scorgie, F., Luchters, S., Simpson, G. and Haghghi, M.M. 2020. COVID-19 in Africa: care and protection for frontline healthcare workers. *Globalization and health*, 16, 1-6.
- Chirico, F., Nucera, G. and Magnavita, N. 2020. COVID-19: protecting healthcare workers is a priority. *Infection Control & Hospital Epidemiology*, 41(9), 1117-1117.
- Gómez-Salgado, J., Domínguez-Salas, S., Romero-Martín, M., Ortega-Moreno, M., García-Iglesias, J.J. and Ruiz-Frutos, C. 2020. Sense of coherence and psychological distress among healthcare workers during the COVID-19 pandemic in Spain. *Sustainability*, 12(17), 6855.
- Hacimusalar, Y., Kahve, A.C., Yasar, A.B. and Aydin, M.S. 2020. Effects of coronavirus disease. 2019. (COVID-19) pandemic on anxiety and hopelessness levels: a cross-sectional study in healthcare workers and community sample in Turkey. *Journal of Psychiatric Research*.

- Keubo, F.R.N., Mboua, P.C., Tadongfack, T.D., Tchoffo, E.F., Tatang, C.T., Zeuna, J.I., Noupoue, E.M., Tsoplifack, C.B. and Folefack, G.O. 2021. Psychological distress among health care professionals of the three COVID-19 most affected Regions in Cameroon: Prevalence and associated factors. In *Annales Médico-psychologiques, revue psychiatrique* Elsevier Masson, 179 (2), 141-146.
- Khan, K.S., Mamun, M.A., Griffiths, M.D. and Ullah, I. 2020. The mental health impact of the COVID-19 pandemic across different cohorts. *International journal of mental health and addiction*, 1-7.
- Kiely, L.F., Moloney, E., O'Sullivan, G., Eustace, J.A., Gallagher, J. and Bourke, J.F. 2021. Irritant contact dermatitis in healthcare workers as a result of the COVID-19 pandemic: a cross-sectional study. *Clinical and experimental dermatology*, 46(1), 142-144.
- Kim, R., Nachman, S., Fernandes, R., Meyers, K., Taylor, M., LeBlanc, D. and Singer, A.J. 2020. Comparison of COVID-19 infections among healthcare workers and non-healthcare workers. *PloS one*, 15(12), e0241956.
- Kim, S.C., Quiban, C., Sloan, C. and Montejano, A. 2021. Predictors of poor mental health among nurses during COVID-19 pandemic. *Nursing Open*, 8(2), 900-907.
- Marshall, B. 2020. Impact of COVID-19 on nurses' mental health, 853-854.
- National Institute for Communicable Disease. 2021. COVID-19 Surveillance Reports. Available at: <https://www.nicd.ac.za/diseases-a-z-index/covid-19/surveillance-reports/> (accessed June 2021)
- Nyashanu, M., Pfende, F. and Ekpenyong, M.S. 2020. Triggers of mental health problems among frontline healthcare workers during the COVID-19 pandemic in private care homes and domiciliary care agencies: Lived experiences of care workers in the Midlands region, UK. *Health & social care in the community*.
- Powell-Jackson, T., King, J.J., Makungu, C., Spieker, N., Woodd, S., Risha, P. and Goodman, C. 2020. Infection prevention and control compliance in Tanzanian outpatient facilities: a cross-sectional study with implications for the control of COVID-19. *The Lancet Global Health*, 8(6), e780-e789.
- Ramadhani, H.O., Bartlett, J.A., Thielman, N.M., Pence, B.W., Kimani, S.M., Maro, V.P., Mwako, M.S., Masaki, L.J., Mmbando, C.E., Minja, M.G. and Lirhunde, E.S., 2014.

- Association of first-line and second-line antiretroviral therapy adherence. In *Open forum infectious diseases* (Vol. 1, No. 2, p. ofu079). Oxford University Press.
- Rodríguez, B.O. and Sánchez, T.L. 2020. The Psychosocial Impact of COVID-19 on health care workers. *International braz j urol*, 46, 195-200.
- Robertson, L.J., Maposa, I., Somaroo, H. and 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.
- Sampaio, F., Sequeira, C. and Teixeira, L. 2020. Impact of COVID-19 outbreak on nurses' mental health: a prospective cohort study. *Environmental Research*, 110620-110620.
- Sandesh, R., Shahid, W., Dev, K., Mandhan, N., Shankar, P., Shaikh, A. and Rizwan, A. 2020. Impact of COVID-19 on the mental health of healthcare professionals in Pakistan. *Cureus*, 12(7).
- Sasaki, N., Kuroda, R., Tsuno, K. and Kawakami, N. 2020. The deterioration of mental health among healthcare workers during the COVID-19 outbreak: A population-based cohort study of workers in Japan. *Scandinavian journal of work, environment & health*, 46(6), 639-644.
- Schwartz, K.L., Achonu, C., Buchan, S.A., Brown, K.A., Lee, B., Whelan, M., Wu, J.H. and Garber, G. 2020. COVID-19 infections among healthcare workers and transmission within households. *medrxiv*.
- Sheraton, M., Deo, N., Dutt, T., Surani, S., Hall-Flavin, D. and Kashyap, R. 2020. Psychological effects of the COVID-19 pandemic on healthcare workers globally: A systematic review. *Psychiatry research*, 292, 113360.
- Spoorthy, M.S., Pratapa, S.K. and Mahant, S. 2020. Mental health problems faced by healthcare workers due to the COVID-19 pandemic—A review. *Asian journal of psychiatry*, 51, 102119.
- Stribling, J., Clifton, A., McGill, G. and de Vries, K. 2020. Examining the UK Covid-19 mortality paradox: Pandemic preparedness, healthcare expenditure, and the nursing workforce.

- The New Humanitarian. 2021. South Africa's daunting COVID-19 vaccine rollout. Accessed on 28/05/2021, from <https://www.thenewhumanitarian.org/analysis/2021/4/28/south-africas-daunting-COVID-19-vaccine-rollout>.
- Tsamakis, K., Rizos, E., Manolis, A.J., Chaidou, S., Kypouropoulos, S., Spartalis, E., Spandidos, D.A., Tsiptsios, D. and Triantafyllis, A.S. 2020. [Comment] COVID-19 pandemic and its impact on mental health of healthcare professionals. *Experimental and Therapeutic medicine*, 19(6), 3451-3453.
- Usher, K., Durkin, J. and Bhullar, N. 2020. The COVID-19 pandemic and mental health impacts. *International Journal of Mental Health Nursing*, 29(3), 315.
- Wilson and Parra: Chicago Tribute Breaking News: 25 March 2020. Chicago has fallen. Behind every name was a person lost to the pandemic in Chicago and surrounding Cook County. Available at: <https://www.wbez.org/stories/names-of-those-who-died-from-covid-19-in-chicago/12a6c23b-e628-47d4-b821-81dfe3c1cdef> (accessed June 2021).
- World Health Organisation. 2020. Covid-19-advice for the public: Available at: <http://www.who.int/emergencies/disease/novel-coronavirus-2019/advice-for-the-public>: (accessed May 2020).
- World Health Organization. 2020. Report of the WHO-China Joint Mission on Coronavirus Disease 2019 (COVID-19) 16-24 February 2020 (Internet). Geneva: World Health Organization: available at <http://www.who.int/docs/default-source/coronaviruse/who-china-joint-mission-on-Covid-19-final-report.pdf> (accessed June 2021).
- Zhang, M., Zhou, M., Tang, F., Wang, Y., Nie, H., Zhang, L. and You, G. 2020. Knowledge, attitude, and practice regarding COVID-19 among healthcare workers in Henan, China. *Journal of Hospital Infection*, 105(2), 183-187.
- Zhu, Z., Xu, S., Wang, H., Liu, Z., Wu, J., Li, G., Miao, J., Zhang, C., Yang, Y., Sun, W. and Zhu, S. 2020. COVID-19 in Wuhan: immediate psychological impact on 5062 health workers. *MedRxiv*.

Manuscript 2: Original Research

The Psychosocial Impact of Coronavirus (COVID-19) Pandemic on Nurses at a selected Tertiary Hospital in Limpopo Province, South Africa

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Despite Coronavirus (COVID-19), posing a massive threat to public well-being throughout the country, health workers were forced to deal with their fears and anxiety while caring for those infected. The study aimed to explore and describe the psychosocial impact of COVID-19 on nurses at a selected hospital in Limpopo Province. An exploratory-descriptive research design was used to conduct the study. To select professional nurses, a purposeful sampling method was applied. Twenty nurses were interviewed using semi-structured interviews, where individual in-depth interviews were conducted using an interview guide to collect data. The interview guide contained one central question to give direction supported by probing questions for a clear understating of the information provided. The collected data include the Psychological and Social Impact of COVID-19 on nurses. Two also had to emerge 14 sub-themes. The study's findings revealed that COVID-19 had a massive impact on nurses, especially those who were in contact with patients who tested COVID-19 positive. The impact included psychological and social stress in the form of fear, trauma, stigmatization and discrimination and resilience. Therefore, the psychological challenges of COVID-19 on healthcare professionals require serious attention from the relevant health authorities, such as the Ministry of Health and the government.

Keywords: COVID-19; Hospital; Impacts; Nurses; Psychosocial; Pandemic.

1. INTRODUCTION

The COVID-19 pandemic resulted in various social, economic, and political challenges. The healthcare workers, especially those that were directly involved in treating and caring for COVID-19 patients, had experienced tremendous socio-psychosocial challenges (Rodríguez and Sánchez, 2020). Most healthcare workers' situation requires adequate human resources and sufficient healthcare protective materials, which were often lacking, especially at the initial stages of COVID-19. This resulted in most healthcare professionals experiencing burnout syndrome, anxiety, stress, and Post-Traumatic Stress Disorder (PTSD). Although these challenges were experienced differently from one context to another, the common aspect among most scholars was that these socio-psychological challenges require immediate attention to be mitigated through involving psychologists, education, enhanced awareness, and follow-ups on the therapeutic interventions (Cabarkapa, Nadjidai, Murgier and Ng, 2020; Powell-Jackson, King, Makungu, Spieker, Woodd, Risha and Goodman, 2020).

The frontline workers' response to COVID-19 was a complex experience (Aughterson, McKinlay, Fancourt and Burton, 2021). The experience was mixed with the battle for survival, apart from the professional responsibility to save patients. This had led to huge psychological morbidity among frontline healthcare providers (Aughterson, McKinlay, Fancourt and Burton, 2021; Hong, Ai, Xu, 2021). However, these psychological impacts differed from one context to another based on various reasons. For example, in some developing countries, especially in Africa, most of the frontline healthcare professionals either did not receive the PPEs in time or the PPEs were insufficient.

2. Research Methods and Design

This research followed the qualitative methodology in the collection and analysis of data. An in-depth interview method using a semi-structured interview guide to give direction with probing questions to seek clarity and more understanding of the information provided was used. The participants were all from a culturally diverse facility. Therefore, the in-depth individual interview was facilitated in both English and Sepedi. The data collection instrument was pre-tested using 10 participants. However, the data was not integrated into the final data collection.

2.1 Research design

This study followed the exploratory-descriptive design to gather perspectives from the participants guided by the research objectives. Exploratory-descriptive design is a purposive,

systematic, prearranged undertaking design to maximise the discovery of generalization leading to the description and understanding of an area of social or psychological life (Hunter et al., 2019). The design allows the researcher to explore the topic with limited coverage within the literature. It also allows the participants to contribute to developing new knowledge in the area of study (Hunter et al., 2019).

2.2 Study setting

The study setting was one of the tertiary hospitals at the centre of Polokwane Local Municipality within Capricorn District, Limpopo Province, South Africa. The selected hospital is among the 43 public hospitals in the province, but one designated to admit and care for the COVID-19 patient within Capricorn District. The estimated number of staff compliments within the selected hospital is about 1 560 within various departments or sections and are Nursing, Clinical, Finance and Cooperate services. The selected hospital provides holistic health care services to a culturally diverse population, mostly Pedi-speaking people from the surrounding urban and rural areas.

2.3 Study population

Population refers to the total number of possible units or elements included in the study (Gray, 2009). For this study, the population refers to all nurses working at a selected hospital in Capricorn district, Limpopo province, South Africa. The target population are Professional Nurses who were exposed to and came into contact with a patient who tested positive for COVID-19 within the selected hospital. The hospital was mainly selected for its centrality with many professional nurses presumably from different backgrounds, education levels and exposure to COVID-19 patients. In addition, the hospital chosen was found to be relevant for this study because it was one of the tertiary hospitals designated to manage the COVID-19 patient in Polokwane, Capricorn District, Limpopo Province, South Africa.

2.4 Sample size

Sampling is selecting a few respondents from a bigger group to conclude the area of interest (Brink et al., 2018). This study employed non-probability sampling following the purposeful sampling technique to select a manageable group of nurses to provide detailed responses on the matter under investigation. The nurses were selected from various wards, such as ICU, Wards Q, R and Wards S, including casualty within the selected hospital based on their availability and exposure to COVID-19 patients. The nurses who worked with the COVID-19 patients were found to be more eligible and willing to participate in the study, and they provided insightful opinions regarding the psychosocial impacts of COVID-19 through their experience. The researcher approached the management of the selected hospital in

Capricorn district, Limpopo province, South Africa, to seek advice and access to the nurses at the forefront in assisting COVID-19 patients. The sample size is defined as the number of participants included in a study (Institute for Work and Health, 2018). For this study, the researcher interviewed 20 Nurses, and they were able to answer the research question and generate more accurate results.

2.5 Data collection

In-depth interviews were used to collect data from the participants in this study. Data collection is gathering and measuring information on variables of interest in an established systematic (De Jonckheere and Vaughn, 2019). The trustworthiness of the interview guide was confirmed during the pre-test interview. However, the result of the pre-test is not included in this study. The researcher was the key instrument for collecting data through an in-depth individual interview. The interviews in this study were mainly semi-structured interviews that allowed and gave direction to probing questions. Probing questions were key to seeking clarity and more understanding of the information provided from the unique experiences of each participant. The participants were all from a culturally diverse facility. Therefore, the in-depth individual interviews were facilitated in both in English and Sepedi.

Interview guide

The researcher introduced herself as the key instrument to collect data through an in-depth individual interview. To create and establish a good rapport, the researcher started by asking basic general questions such as what nursing qualification do you have and how long have you been working in this facility? The researcher then proceeded to the main interview question- *What is the Psychosocial impact of COVID-19 among nurses?* Supported by probing questions to clarify the subject until data is saturated. At the closing remark of each interview session, the researcher again asked two general questions: *Do you think we have exhausted all the elements of psychosocial impact? What is your recommendation on the subject?* And in the absence of questions from the participant, the researcher appreciated the participants' responses to the research question.

The interviews were conducted in the office of the Nursing Manager to ensure privacy and confidentiality. The data was collected between November and December 2022, and the information provided was audio recorded.

2.6 Data analysis

Data analysis inspects and transforms data to discover useful information to inform conclusions and support decision-making. For this study, the researcher employed thematic

analysis to identify, analyse, and interpret patterns of meaning (theme) within qualitative data. The analysis process contained six steps by Clarke and Braun (2015) that involved familiarisation of the data, generalising initial code, searching for themes, reviewing themes, defining themes and finally, writing up the findings following that order.

2.7 Ethical considerations

The researcher carefully followed the ethical considerations by applying moral rules and professional codes of conduct to collect, analyse, report and publish information about research subjects. Firstly, the researcher acquired approval, quality check and ethical clearance from the University of Venda respectively from the Faculty of Health Science (FHS), the Faculty of Health Sciences Higher Degree Committee (FHDC), Executive FHDC, UHDC and the Human and Clinical Trial Research Ethics Committee (HCTREC). Secondly, the researcher requested permission to collect data from the Provincial Department of Health. Lastly, the researchers requested permission to access and interview the Nurses who were exposed to and came into contact with patients who tested COVID-19 at Polokwane Hospital in Limpopo Province, South Africa. All the participants in this study were informed about the purpose of the research and consent thereof to participate. The researcher respected the confidentiality and privacy of the participants by not providing names or identifying information when presenting the data. There was wholly voluntary participation and non-discrimination followed by an honest presentation of data.

3 Results

In-depth individual interviews were successfully conducted with one central question, which allowed probing questions to gather more information. A rich illustration of the complete dataset was provided and analysed to get a clear vision of the subject under investigation. The analysis revealed two major themes: (1) the psychological impact of COVID-19 on nurses and (2) the Social impact of COVID-19 on nurses. These themes and related subthemes are outlined in Table 3.

Table 2. Background characteristics of the participants:

Participants	Gender F or M.	Age A- 0yrs	Qualification	Years of experience	COVID-19 specific training
P 1	Female	59	Prof. Nurse	28	None

P 2	Female	58	Prof. Nurse	35	None
P 3	Female	56	Prof. Nurse	26	None
P 4	Female	53	Prof. Nurse	21	None
P 5	Female	49	Prof. Nurse	11	None
P 6	Female	47	Prof. Nurse	16	None
P 7	Female	45	Prof. Nurse	16	None
P 8	Female	44	Prof. Nurse	11	None
P 9	Female	43	Prof. Nurse	15	None
P 10	Female	42	Prof. Nurse	14	None
P 11	Female	42	Prof. Nurse	10	None
P 12	Male	40	Prof. Nurse	12	None
P 13	Female	40	Prof. Nurse	10	None
P 14	Female	39	Prof. Nurse	15	None
P 15	Female	39	Prof. Nurse	10	None
P 16	Female	39	Prof. Nurse	10	None
P 17	Female	35	Prof. Nurse	6	None
P 18	Male	30	Prof. Nurse	2	None
P 19	Male	28	Prof. Nurse	2	None
P 20	Male	25	Prof. Nurse	2	None
	Female	25	Prof. Nurse	<2	None

(F- Female, M- Male and A- Age)

The maximum time of the interview was 60 minutes, ranging from 40- 60. Sixteen females and four males fully. Five eligible nurses from one of the Wards that was designated for

COVID-19 patients could not participate in the study due to the nature of their daily activity, workload, and emergency cases throughout. Members ensured credibility, whereby the researcher played back the recorded audio to confirm the response. From the thematic data analysis, the researcher recognised four themes containing a diversity of sub-themes (Table 3). The main themes and the sub-themes are described below and proved by interview quotations.

Table 3. Main themes and sub-themes.

Themes	Sub-themes
The psychological impact of COVID-19 on Nurses	<ul style="list-style-type: none"> ● Psychological trauma caused by COVID-19 deaths ● Nurses developed resilience due to COVID-19 ● Nurses felt the management neglected their psychological needs ● Fear of dying from COVID-19
Social impact of COVID-19 on Nurses	<ul style="list-style-type: none"> ● Fear of infecting their family with COVID-19 ● Nurses felt stigmatized by their families and communities ● Nurses felt stigmatized and discriminated against by colleagues and management.

Theme 1: The psychosocial impact of COVID-19 on Nurses

This study's psychosocial concepts refer to the individual's attitude to the COVID-19 pandemic, particularly to nurses. The following factors were identified as the major torture: psychological trauma caused by COVID-19 deaths. Nurses developed resilience due to COVID-19 and felt the management neglected their psychological needs. The findings revealed that some nurses expected to receive counselling from the management, which was not practised due to fear of contracting or transmitting the Covid-19.

Sub-theme 1.1: Psychological trauma caused by COVID-19 deaths

The findings of this study revealed that the mere fact of witnessing people passing away because of Covid-19 and being the hope of many people regarding the life of their beloved ones was tremendously a huge challenge. According to many nurses in this study, this burden had immense psychological challenges. Most nurses had to resuscitate patients being treated for Covid-19, and when most of these people do not survive, it affected them. The study further revealed that several reasons contributed to the psychological challenges that

the health professionals were subjected to. A participant expressed their experiences as follows:

Participant 6 (F- 47yrs) *“The most painful experience was to lose our colleagues due to Covid-19 that they contracted it while caring for the patient. One of the colleagues who passed on was our dedicated Doctor who also died due to Covid-19. He died in our eyes.”*

Participant 2 (F- 58yrs) *“There was a day were I admitted my mother, father and one of my siblings who was 27 years old, a qualified lawyer in one day. My father passed on and was buried on Thursday, the same Thursday my siblings passed on and in the preparations of my sibling my mother passed on too”*

Participant 3 (F- 56yrs) *“Psychologically, I was highly affected, especially in a case where you resuscitate a patient and she or he does not survive/die it affects you as a person, is not a nice experience to witness people die within a very short space of time, it’s scary”*

Sub-theme 1.2. Nurses developed resilience due to COVID-19.

The other nurses expressed concerns that it was not easy to work while wearing the PPE since they were not used to this requirement. Apart from the complex working schedules, this study's findings revealed that some health professionals were practising self-quarantine to prevent the possibility of infecting family members with Covid-19.

Participant 4 (F- 53yrs) said, *“We were expected to care for those patients. We continued to continue providing the service as expected because we had no other choice but to continue working.”*

Participant 13 (F- 40yrs) shared that *“It also helped me to see for those who care about me, especially when I was sick, because of fear to die due to covid 19 it gave me the courage to talk about death. I even wrote my own will and shared it with my family because I felt like I was ready to die. Spiritually it carried me closer to God, as I was praying more than before.”*

Participant 8 (F- 44yrs) shared, *“For me, the only thing that gave me hope and courage to continue working was the introduction of PPE, I had the fear, but it was a lesson by the use of PPE, though it was not that comfortable. I was just hopeful that at least it would protect me from contracting COVID-19.”*

Sub-theme 1.3. Nurses felt the management neglected their psychological needs.

Lack of support and management was highlighted as contributing to the nurse's psychological well-being during COVID-19.

Participant 12 (M- 49yrs) expressed that *“I personally feel like the Government does not really care much about the nurse or the health care professional. All they care about was just us coming to work and caring for those sick ones without considering how we feel.”*

Participant 10 (F- 42yrs) reiterated that *“Debriefing was never done properly, especially the one on one it was never done, it was only once off and in we were in a group where we were just being updated about work. It was necessary debriefing, no one ever asked me or any nurse that how are doing, we were just working as and when we are on duty.”*

Participant 3 (F- 56yrs) felt that *“The support was not there. For one, I was never taken for debriefing or counselling. We were just working.”*

Participant 10 (F- 42yrs) indicated that *“It was only when I felt too overwhelmed, then I arranged my own consultation with my personal Psychologist, the painful part was that even the managers in charge were scared to enter the COVID-19 wards, they were only asking for statistics standing in the distance far from the wards.”*

Sub-theme 1.4. Fear of dying from COVID-19

The healthcare professionals were being side-lined. Communities were trying to avoid interacting with them since they were labelled as the carriers of COVID-19. Most of them were experiencing this in public transport, where being expressed being uncomfortable around them or boarding the same public transport with them. These activities affected the social life and welfare of the nurses within communities. Despite some of them being aware of the severity of COVID-19 and risking their lives in attending to COVID-19 patients, they could not leave their jobs because they were the breadwinners for their families.

The outbreak of the COVID-19 pandemic and efforts to find a solution and treat patients had a negative impact on the nurses and the general healthcare workers in the frontline interacting with patients. Some of the nurse participants in this study revealed that witnessing people passing away because of COVID-19 and being the hope of many people regarding the life of their beloved ones was a huge challenge. According to many nurses in this study, this burden had immense psychological challenges. Most nurses had to resuscitate patients being treated for COVID-19, and when most of these people do not survive it, it affected them.

Some of the participants in this study revealed that the impact of COVID-19 was associated with fear and emotional distress.

Participant 4 (F- 53yrs) shared her experience *“At the beginning of COVID-19, no one explained anything to us about COVID-19. I was just working with fear of death, I was living with the fear of death, but because of the nature of my profession I accepted the situation but with the fear of the possibility not to see my kids again.”*

Theme 2: Social impact of COVID-19 on nurses

The severity of the social impact of COVID-19 associated with COVID-19 was more emphasised by the participants concerning the fear that most of the community members feared to be associated with them in daily activities. Healthcare professionals bear the brunt of insults and concerns raised by communities regarding the regulations and nature of the COVID-19 pandemic that was not quite understood by the general public.

Sub-theme 2.1: Fear of infecting the family with COVID-19

Interestingly, the findings of this study also revealed that the psychological challenges that the nurses experienced were not strictly because of the changed working circumstances but also through challenges at a personal level. The outbreak of the COVID-19 pandemic and efforts to find a solution and treat patients had a negative impact on the nurses in particular and the general healthcare workers in the frontline interacting with patients.

Participant 9 (F- 43yrs) expressed, *“I was just working with fear of death, fear to infect the family and kids instead of protecting them. I felt like the nature of my work expose them, and if one dies, I will blame myself forever”*.

Participant 1 (F-59yrs) shared, *“I had a fear that it will easily spread amongst our family and us. I am a nurse, but I am a mother too. I am expected to take care of my children.....I was faced with the dilemma of exposing my family to COVID-19,”*

Participant 3 (F- 56yrs) also shared that *“being a nurse and working at COVID-19 ward was totally risky to our kids and family, and I could not resign because as a breadwinner”*.

Sub-theme 2.2. Nurses felt stigmatized by their families and communities.

The participants more emphasized the severity of the social impact of COVID-19 associated with COVID-19, the fear that most of the community members feared to be associated with

them in daily activities. Healthcare professionals bear the brunt of insults and concerns raised by communities regarding the regulations and nature of the COVID-19 pandemic that were not quite understood by the general public.

Participant 5 (F-49yrs) shared, *"I was using public transport to come to work and it was painful and difficult because you cannot hide that you are a nurse in uniform. Passengers were scared to sit next to me in a taxi. They even refused to touch my money and said I would give it to the driver myself when I get off. The same story when you go shopping in a nursing uniform. You could see that cashiers are also not comfortable helping you, especially in the tuck shops within the hospital, especially when they know that you are coming from the COVID-19 ward, then you are automatically carrying it"*

Participant 12 (M-40yrs) had to say this *"Socially, wherever I go or pass, you would feel that isolation and stigmatization. As a nurse, you are always a suspect of spreading Covid 19."*

Participant 10 (F-42yrs) said, *"Interaction with family changed as others were distancing themselves from me simply because I am working in a hospital, and specifically in the COVID-19 ward. I could not even attend church and visit my extended family because of the stigmatization of being a nurse. It was difficult because even in public transport, it was not easy because immediately when you come in nurses uniform, you are stigmatized and labelled as the carrier of COVID-19."*

Participant 3 (F-56yrs) shared that *"the community were scared of us. They were distancing themselves from me as a nurse....Using public transport was torture because nurses were labelled as the carrier of COVID-19."*

Participant 1 (F-59yrs) shared that *"family were isolating me because of fear that I will infect them with COVID-19."*

Participant 7 (F- 45yrs) had to say these *"Those who were close to me started to distance themselves from me, my family were scared of me, to such an extent that when I come back from work my normal routine changed, when I came back from work, I was going straight to the garage where I would find a gown. Firstly I take off all my uniform and put them in a plastic bag, put on a gown, go straight to the bathroom, take a bath, and sanitize wherever I touched before I could join the family in the sitting room, or access other space in the house."*

Participant 3 (F- 56yrs) had to say these *“My kids were also scared for their life. They were scared of me because I was directly working in COVID-19 wards to such an extent that my kids and my husband moved out of the house and left me alone.”*

Sub-theme 2.3. Nurses felt stigmatized by colleagues and management.

Healthcare professionals bear the brunt of insults and concerns raised by communities regarding the regulations and nature of the COVID-19 pandemic that were not quite understood by the general public.

Participant 2 (F-58yrs) shared that *“I experienced discrimination from our own colleague to such an extent that no one was willing to share the lift with me or any colleague working with COVID-19 because we were known to work with COVID-19 patients.”*

Participant 10 (F-42yrs) shared, *“I experienced stigmatization even amongst colleagues, for example, when you go pharmacy within the hospital. Immediately when they hear that you are coming from the COVID-19 wards, they would want to help you quickly so that you leave because of the fear that you will give the corona. We ended up ordering medication by telephone because our colleagues were also scared to interact with us.”*

Participant 3 (F-56yrs) shared that *“the management would just be asking the statistics while standing far/ distancing themselves from the COVID-19 wards while we are inside that ward daily. COVID-19 was very painful and scary.”*

4. Discussion

This study's findings revealed that some participants understood the definition of *‘psychosocial’* challenges. This term was explained by providing an in-depth analysis of the psychosocial challenges that the health professionals experienced. The findings revealed several reasons that contributed to the psychological challenges the health professionals were subjected to. One of these reasons was the restrictions that were imposed on health professionals through difficult and long working shifts. The other nurses expressed concerns that it was not easy to work while wearing the PPE since they were not used to this requirement. This was similar to previous studies, such as the study by Kang, Son, Chae, and Corte (2018) and Hoernke, Djellouli, Andrews, Lewis-Jackson, Manby, L., Martin, Vanderslott and Vindrola-Padros (2021), indicated that healthcare professionals were not at ease working with the PPEs.

The findings of this study revealed that, apart from the complex working schedules, some healthcare professionals were practising self-quarantine to prevent the possibility of infecting family members with COVID-19. These practices had negative implications on the psychological and social welfare of nurses. Bielicki, Duval, Gobat, Goossens, Koopmans, Tacconelli and van der Werf (2020) revealed that the practices for preventing COVID-19 among healthcare professionals were problematic they restricted the social aspect of life among these healthcare professionals. Self-quarantine was psychologically problematic because it detached them from their social routine and interaction with others. The findings revealed that some nurses expected to receive counselling from the management for these challenges. This was not practised due to fear of contracting or transmitting COVID-19. The thought of losing loved ones and immediate family members was another serious concern that affected the healthcare professional. The study by Dubey, Biswas, Ghosh, Chatterjee, Dubey, Chatterjee, Lahiri and Lavie (2020) revealed that forced quarantine had a negative psychological impact on healthcare professionals.

Interestingly, the findings of this study also revealed that the psychological challenges that the nurses experienced were not strictly because of the changed working circumstances but also through challenges at a personal level. For example, some participants expressed that they could not function fully and experienced emotional breakdowns because they had to witness people close to them suffering from COVID-19 and family members dying because of COVID-19. Similarly, the study by Liu, Han, Jiang, Huang, Ma, Wen, Zhang, Wang, Chen and Ma (2020) also identified that the mental health status of China was highly affected by the fear of contracting or spreading the virus to the family members. Another study by Shen, Zou, Zhong, Yan and Li (2020) revealed that the psychological stress of the ICU nurses during COVID-19 was problematic, with high levels of uncertainty about what will become of their lives and the future.

Lovrić, Farčić, Mikšić and Včev (2020) revealed that student nurses experienced discrimination in their immediate social public spaces, such as in boarding public transport, especially when they were identifiable with their uniforms. The perception was that because they were working with people suffering from COVID-19, they were labelled the carriers of COVID-19. Bagchi (2020) explained this as a stigma associated with COVID-19. Some of the participants in this study revealed that the impact of COVID-19 was associated with fear and emotional distress. Aydin and Balci (2020) indicated the stigma people had made to discriminate against others without proper knowledge of what COVID-19 entailed, the level of risk, its impact, and the preventive measures. Bruns, Kraguljac, and Bruns (2020) revealed a risk of cultural considerations and a high risk of stigmatisation associated with the COVID-19 pandemic among healthcare professionals and the general public.

Similarly, the findings of this study showed that healthcare professionals were being sidelined and communities were trying to avoid interacting with them since they were labelled as the carriers of COVID-19. Most of them were experiencing this in public transport, where being expressed being uncomfortable around them or boarding the same public transport with them. These activities affected the social life and welfare of the nurses within communities. Despite some of them being aware of the severity of COVID-19 and risking their lives in attending to COVID-19 patients, they could not leave their jobs because they were the breadwinners for their families.

Participants emphasised the severity of the social impact of COVID-19 with fear that most of the community members feared to be associated with them in daily activities. Healthcare professionals bear the brunt of insults and concerns raised by communities regarding the regulations and nature of the Covid-19 pandemic that was not quite understood by the general public. This is not a new phenomenon exclusive to the current study context. The previous study by Zheng, Zhou, Fu, Xiang, Cheng, Chen, Xu, Wu, Feng, Ye and Tian (2021) indicated that COVID-19 resulted in the prevalence of pervasive depression and anxiety among nurses in China. The current study also revealed that some healthcare professionals were uncomfortable with the fact that they could not socially interact with their families normally and always feared that they could infect them with the virus. The geographic location was also problematic for visiting and seeing each other, especially after travelling restrictions between provinces. The lockdown restriction resulted in families leaving apart from each other until some of the restrictions were uplifted, allowing people to move from one point to another. This resulted in a psychological impact on the nurses. A South African study by Mbunge (2020) assessed the effects of COVID-19 on the health system and society in general and discovered that although the travelling bans reduced the spread of COVID-19 among people, they negatively affected the social life of most healthcare professionals.

Research also revealed pervasive COVID-19 vaccine hesitancy among most healthcare professionals. The study by Dror, Eisenbach, Taiber, Morozov, Mizrahi, Zigran, Srouji and Sela (2020) indicated that vaccine hesitancy was another critical challenge during COVID-19. Many conspiracy theories and stigma around vaccines made most people, including healthcare professionals, resist being vaccinated (Fares, Elmnyer, Mohamed and Elsayed, 2021). This study also revealed that most nurses suffered psychologically through the fear that they were among the first people to receive the vaccine amid a myriad of negative conspiracy theories about the vaccines. Family members, especially the children, were experiencing difficulties realizing that the parents were being vaccinated for the first time without knowing the implications of the vaccines. The myths and assumptions associated with COVID-19 made healthcare professionals fearful and uncomfortable taking the vaccines.

Some thought it was being used as experiments for the feasibility of the vaccines. The conspiracy theories were also being spread through disinformation on social media platforms such as WhatsApp and Facebook. This made the nurses and the family members fear Covid-19 and their fate that one of the family members, as a mother, father or brother, had to be vaccinated, let alone working with the COVID-19 patients. Qattan, Alshareef, Alsharqi, Al Rahahleh, Chirwa and Al-Hanawi (2021) identified that the acceptance of vaccines among nurses was a significant predictor of how the general public could accept vaccines.

5 Limitations of the Study

This research had limitations that may affect the generalizability of its findings. The sample population was limited to nurses in South Africa, and only black nurses were included, which may not provide a complete picture of the psychological impact of COVID-19 on healthcare professionals. The researcher focused primarily on fear, anxiety, stigma, and other emotional symptoms. Still, other aspects may not be covered, suggesting that further research could enhance our understanding of this phenomenon.

6 Conclusion

The findings of this study revealed that the COVID-19 pandemic had serious socio-psychological implications for nurses and healthcare professionals. The findings of this study are important and show that the problem of psychological impact among nurses is more complex than it seems to be. Investigating these socio-psychological challenges is imperative to inform future patterns and approaches on how this could be harnessed through policy terms, regulations, and social interventions. For the sustainable social well-being of healthcare professionals, the Department of National Health in South Africa needs to apply socio-psychological therapists at healthcare facilities to monitor behavioural and psychological challenges among healthcare professionals. The lack of PPEs among the nurses in this study and generally to healthcare professionals in South Africa is detrimental to how the nurses operate and significantly affects mental capabilities. Future studies must expand on the relationships between the lack of PPEs and the mental effects. These variations and similarities are important to improve the understanding of the causes of the psychological effects of COVID-19 and help understand such circumstances in future health crises.

The findings of this study strongly recommend that nurses and healthcare professionals need to be assisted with initiatives to be helped to recover from psychological problems. Perhaps the Department of Health in South Africa is to establish Social Work professionals and Therapists to assist healthcare professionals with psychological challenges. It is through

scientific inquiries such as the current research that perspectives regarding the circumstances of healthcare crisis can inform of the measures to reduce the severity of psychological challenges and transform these combinations into potentialities of assistance.

7 Recommendations

Nurses, particularly those directly working with COVID-19 patients, or any possible outbreak, need regular debriefing sessions, continuous training and orientation on all measures to be put in place to address the COVID-19 pandemic—a practical and feasible manner of implementing the COVID-19 regulations. The regulations should suit nurses who are designated to COVID-19 Wards. To allow nurses to be part of the planning team to effectively share their experience with Management to improve quality health care services.

Acknowledgements

The researcher acknowledges that participants dedicated their time to participate in this study.

Competing interests

There were no competing interests, such as financial or personal, that might have influenced the authors to conduct this study.

Authors' contribution

All the authors indicated in this study made full and equal contributions to the conceptualisation of this study.

Funding

To the knowledge of the authors, there was no funding that was received for the purpose of this study.

Data availability

The data supporting the findings of this research is available from the corresponding author of the study, Noria Madithapo Maja, on reasonable request.

Disclaimer

The opinions and views expressed in this study are those of the authors, based on the findings, and they do not necessarily reflect the official policy or position of any affiliated

agency of the authors. These views do not undermine the current practice of the affiliated respondents in this study but represent the current trends on the psychological impact of COVID-19 among nurse participants in this study.

1. References

- Aydin, S. and Balci, A., 2020. COVID-19 knowledge level research in nurses. *Journal of Surgery and Research*, 3(3), pp.198-203.
- Bagcchi, S. 2020. Stigma during the COVID-19 pandemic. *The Lancet Infectious Diseases*, 20(7), p.782.
- Bielicki, J.A., Duval, X., Gobat, N., Goossens, H., Koopmans, M., Tacconelli, E. and van der Werf, S. (2020). Monitoring approaches for healthcare workers during the COVID-19 pandemic. *The Lancet infectious diseases*, 20(10), pp.e261-e267.
- Bruns, D.P., Kraguljac, N.V. and Bruns, T.R., 2020. COVID-19: Facts, Cultural Considerations, and Risk of Stigmatization. *Journal of transcultural nursing*, 31(4), pp.326-332.
- Dror, A.A., Eisenbach, N., Taiber, S., Morozov, N.G., Mizrahi, M., Zigran, A., Srouji, S. and Sela, E., 2020. Vaccine hesitancy: the next challenge in the fight against COVID-19. *European journal of epidemiology*, 35, pp.775-779.
- Dubey, S., Biswas, P., Ghosh, R., Chatterjee, S., Dubey, M.J., Chatterjee, S., Lahiri, D. and Lavie, C.J., 2020. Psychosocial impact of COVID-19. *Diabetes & Metabolic Syndrome: clinical research & reviews*, 14(5), pp.779-788.
- Fares, S., Elmnyer, M.M., Mohamed, S.S. and Elsayed, R. 2021. COVID-19 vaccination perception and attitude among healthcare workers in Egypt. *Journal of primary care & community health*, 12, p.21501327211013303.
- Hoernke, K., Djellouli, N., Andrews, L., Lewis-Jackson, S., Manby, L., Martin, S., Vanderslott, S. and Vindrola-Padros, C., 2021. Frontline healthcare workers' experiences with personal protective equipment during the COVID-19 pandemic in the UK: a rapid qualitative appraisal. *BMJ open*, 11(1), p.e046199.
- Kang, H.S., Son, Y.D., Chae, S.M. and Corte, C., 2018. Working experiences of nurses during the Middle East respiratory syndrome outbreak. *International journal of nursing practice*, 24(5), p.e12664.

- Liu, Z., Han, B., Jiang, R., Huang, Y., Ma, C., Wen, J., Zhang, T., Wang, Y., Chen, H. and Ma, Y., 2020. Mental health status of doctors and nurses during COVID-19 epidemic in China. *Available at SSRN 3551329*.
- Lovrić, R., Farčić, N., Mikšić, Š. and Včev, A. 2020. Studying during the COVID-19 pandemic: A qualitative inductive content analysis of nursing students' perceptions and experiences. *Education Sciences*, 10(7), p.188.
- Mbunge, E., 2020. Effects of COVID-19 in South African health system and society: An explanatory study. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews*, 14(6), pp.1809-1814.
- Qattan, A.M., Alshareef, N., Alsharqi, O., Al Rahahleh, N., Chirwa, G.C. and Al-Hanawi, M.K., 2021. Acceptability of a COVID-19 vaccine among healthcare workers in the Kingdom of Saudi Arabia. *Frontiers in Medicine*, 8, p.644300.
- Shen, X., Zou, X., Zhong, X., Yan, J. and Li, L. (2020). Psychological stress of ICU nurses in the time of COVID-19. *Critical Care*, 24, pp.1-3.
- Zheng, R., Zhou, Y., Fu, Y., Xiang, Q., Cheng, F., Chen, H., Xu, H., Wu, X., Feng, M., Ye, L. and Tian, Y., 2021. Prevalence and associated factors of depression and anxiety among nurses during the outbreak of COVID-19 in China: A cross-sectional study. *International journal of nursing studies*, 114, p.103809

SECTION C: CONCLUSION, RECOMMENDATIONS AND LIMITATIONS

4.1. INTRODUCTION

These sections present the overall conclusion and recommendations of the mini-dissertation titled “The Psychosocial impact of Coronavirus (COVID-19) Pandemic on Nurses at a selected tertiary hospital in Limpopo Province, South Africa”. The study aimed to explore and describe the Psychosocial impact of the Coronavirus (COVID-19) pandemic on Nurses at a selected tertiary hospital in Limpopo Province, South Africa. The data is presented and discussed guided by the study's main purpose: to explore the psychosocial Impact of the Coronavirus (COVID-19) pandemic on Nurses at a selected Tertiary Hospital in Limpopo Province, South Africa. The questions asked in this study on the psychological impacts of Covid-19 on health professionals were important to assess the gravity of the challenges caused by COVID-19. This further informed the future techniques and methods to deal with the nature of this severity. The data was presented thematically, and themes were guided by the questions and objectives set for this study. This section provides the conclusions, recommendations, and limitations of the study.

4.2 Conclusions

The conclusion was subdivided according to the manuscripts and the overall conclusion of the comprehensive mini dissertation.

4.2.1 Manuscript 1: “The Psychosocial Impact of COVID-19 Pandemic among Nurses. Conclusion

Most of the systematically reviewed studies used empirical evidence to highlight the impact of COVID-19 among health professionals based on context. Different reasons and factors were presented to have influenced how health professionals were affected across the globe. For example, some health professionals in most developed countries were worried about them being the agents of spreading COVID-19 to their families and loved ones. They were experiencing long-working hours compared to the pre-COVID-19 era. On the other hand, most developing countries, especially in Africa, were psychologically affected because some lack protective materials to prevent contracting and spreading COVID-19. Apart from the high availability demands and straining schedules and shifts, the fear of contracting COVID-19 remained a dominant factor contributing to psychological issues. Most of the studies did not show how health professionals can overcome the challenges as the psychological impact caused by COVID-19. There was also less effort to show the relationships between the findings from context to context. The rural South African setting was less investigated of health professionals' experiences during COVID-19. This necessitated the need for this

research to investigate the impact of COVID-19 among nurses in the rural setting in Limpopo Province of South Africa.

4.2.2 Manuscript 2: “The Psychosocial impact of Coronavirus (COVID-19) Pandemic on Nurses at a selected tertiary hospital in Limpopo Province, South Africa”.

Conclusion

The findings of this study revealed that the COVID-19 pandemic had profound socio-psychological implications for nurses and healthcare professionals. The findings of this study are important and show that the problem of psychological impact among nurses is more complex than it seems to be. Investigating these socio-psychological challenges is imperative to inform future patterns and approaches on how this could be harnessed through policy terms, regulations, and social interventions. For the sustainable social well-being of healthcare professionals, the Department of National Health in South Africa needs to apply socio-psychological therapists at healthcare facilities to monitor behavioural and psychological challenges among healthcare professionals.

The lack of PPEs among the nurses in this study and generally to healthcare professionals in South Africa is detrimental to how the nurses operate and significantly affects mental capabilities. Future studies must expand on the relationships between the lack of PPEs and the mental effects. These variations and similarities are important to improve the understanding of the causes of the psychological effects of COVID-19 and help understand such circumstances in future health crises. The findings of this study strongly recommend that nurses and healthcare professionals need to be assisted with initiatives to be helped to recover from psychological problems. Perhaps the Department of Health in South Africa is to establish Social Work professionals and Therapists to assist healthcare professionals with psychological challenges. It is through scientific inquiries such as the current research that perspectives regarding the circumstances of healthcare crisis can inform of the measures to reduce the severity of psychological challenges and transform these combinations into potentialities of assistance.

4.2.3 General conclusion

The main purpose of the study was to explore and describe the Psychosocial impact of the Coronavirus (COVID-19) pandemic on Nurses at a selected tertiary hospital in Limpopo Province has been achieved as detailed information was provided in line with the research question. This study revealed that the overwhelming burden of COVID-19 has stretched the health system's capacity and increased the risk of infection, coupled with massive

psychological and social impacts that differed from one context to another. The nurses and other healthcare professionals working in the frontline fighting against COVID-19 were identified to live and work with resilience and fear of losing their life due to COVID-19. The collected data were presented and discussed, guided by the study's main purpose. The research questions asked in this study on the psychological impacts of COVID-19 on health professionals were important to assess the gravity of the challenges caused by COVID-19 and inform of future techniques and methods to deal with the nature of this severity. The literature review indicated that the advent of COVID-19 severely impacted the health and welfare of nurses at work and off work. The study shows that most of the nurses designated to work with COVID-19 patients were never prepared psychologically, were never given an opportunity to prepare their families, and were never consulted during the establishment of COVID-19 regulations. Future initiatives are required to monitor the psychological experiences of healthcare professionals because of their experiences. Facilities and programmes to nurture the health of healthcare workers are imperative.

4.3. RECOMMENDATIONS

Recommendation for research

The objectives that were set for this study were achieved. However, future research could employ mixed methodologies to expand the lenses through which this problem could be approached. Mixed methodologies, the quantitative and qualitative research approaches could be significant in giving an in-depth analysis of the nurses' experiences during the COVID-19 pandemic. By expanding and explaining the participants' responses, future research will allow the researcher to gain a full picture of the phenomenon by exploring the people's experiences through the structured closed-ended questionnaires and the open-ended interview guide.

The problem of psychological challenges among healthcare professionals is not only linked to health pandemics such as COVID-19 but also a recurrent problem among healthcare professionals. Hence, the researcher could suggest that future research should focus on investigating the challenges in different contexts and urban and rural communities to identify patterns and trends and experiences of psychological challenges among healthcare professionals. Investigating these challenges from different contexts in South Africa is imperative to inform the decisions on how to minimise or solve the problem of psychological threats among healthcare professionals. Single-handedly, a comparative study regarding psychological challenges among healthcare professionals in South Africa and other African countries and with developed western countries such as the United States of America could

portray vital lessons that could be borrowed to be used in both education and health institutions to curb the possibility of an outbreak in South Africa.

Recommendations for Clinical Practice

The challenges of COVID-19 on healthcare professional requires serious attention from the relevant health authorities such as the Ministry of Health and the government. Facilities and programmes to nurture the health of healthcare workers are imperative. For example, the attention of the social workers at the healthcare facilities, including continuous debriefing sessions, should also be prioritised by healthcare professionals apart from only focusing on the patients. Nurses, particularly those directly working with COVID-19 patients, or any possible outbreak, need regular debriefing sessions, continuous training and orientation on all measures to be put in place to address the COVID-19 pandemic. It is recommended that regulations should suit nurses who are designated to COVID-19 Wards. To allow nurses to be part of the planning team to effectively share their experience with Management to improve quality health care services.

4.4 Summary

This study is about the Psychosocial impact of the Coronavirus (COVID-19) Pandemic on nurses at a selected tertiary hospital in Limpopo, South Africa. This section included a conclusion of two manuscripts, one on the Systematic literature review on the subject being investigated and two on the manuscript on original research, recommendations and the overall conclusion of the mini dissertation. Considering the study findings, healthcare workers, particularly nurses working closely with patients who tested COVID-19 positive, had a tremendous experience since the COVID-19 outbreak, such as Psychological and emotional distress, social isolation, trauma, fear, stigmatisation and discrimination. The study findings revealed that the decision-makers must consult with nurses and other healthcare professionals during the planning and development of policies to provide effective nursing care in South Africa.

APPENDICES

- Ethical clearance from UHDC
- Permission to conduct the study: Limpopo Provincial Department of Health
- Request for permission to conduct study: Limpopo Provincial Department of Health
- Request for permission to conduct study: Selected Tertiary Hospital
- Letter of Information
- Interview guide
- Author guidelines

APPENDIX A: ETHICAL CLEARANCE

ETHICS APPROVAL CERTIFICATE

RESEARCH AND INNOVATION
OFFICE OF THE DIRECTOR

NAME OF RESEARCHER/INVESTIGATOR:

Ms NM Maja

STUDENT NO:

19020587

PROJECT TITLE: The psychosocial impact of Coronavirus (COVID-19) pandemic on Nurses at selected hospital in Limpopo Province, South Africa.

ETHICAL CLEARANCE NO: **FHS/22/PH/01/3003**

SUPERVISORS/ CO-RESEARCHERS/ CO-INVESTIGATORS

NAME	INSTITUTION & DEPARTMENT	ROLE
Prof L Makhado	University of Venda	Supervisor
Dr SE Tshivhase	University of Venda	Co - Supervisor
Ms NM Maja	University of Venda	Investigator – Student

Type: **Masters Research**

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

Approval Period: **March 2022 – March 2024**

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

General Conditions

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

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

ISSUED BY:

UNIVERSITY OF VENDA, RESEARCH ETHICS COMMITTEE

Date Considered: February 2022

Name of the HCTREC Chairperson of the Committee: **Dr NS Mashau**

Signature:




Appendix B: Permission Letter Limpopo DOH



LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF
HEALTH

Ref : LP_2022-05-001
Enquires : Ms PF Mahlokwane
Tel : 015-293 6028
Email : Phoebe.Mahlokwane@dhsd.limpopo.gov.za

Noria Madithapo Maja


PERMISSION TO CONDUCT RESEARCH IN DEPARTMENTAL FACILITIES

Your Study Topic as indicated below;

The Psychosocial Impact of Corona virus (COVID-19) Pandemic on Nurses at a Selected Tertiary Hospital in Limpopo Province, South Africa.

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

-Your cooperation will be highly appreciated



pp **Head of Department**

06/06/2022

Date

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

The heartland of Southern Africa – Development is about people!

APPENDIX C

Appendix C1: Letter to Request Permission from the Provincial Department of Health

PO BOX 5404
Polokwane North
0750

Enquiries: Maja N.M.

Cell No: 076 195 4004

Email address: noriah.maja@gmail.com

To: The Head of the Department of Health

P/Bag X 9301

Polokwane

0700

Request for permission to conduct a research study at Polokwane Hospital in Capricorn District, Limpopo Province, South Africa.

I Noria Madithapo Maja registered student for Master of Public Health (MPH), at the University of Venda. I hereby request to conduct a research study in Polokwane Hospital, in Capricorn District, Limpopo Province. The study title stated as **“The psychosocial impact of Coronavirus (COVID-19) pandemic on Nurses working at a selected tertiary hospital in Limpopo Province, South Africa”**.

The hospital is selected based on its exposure in dealing with COVID -19 Cases in the district. It is one of the first hospitals in the district found with the first case of COVID-19 amongst the Health Care Workers (Doctor). The case overwhelmed most Health Care Workers, especially those who were in contact with the patient prior to the test. It is for this reason the hospital is identified as the appropriate setting for this study.

It is predicted that the study will contribute towards improving the health and safety of the Health Care workers while caring for those who are infected and affected by COVID -19.

The researcher undertakes to observe all ethical principles for conducting the research. All information to be acquired will be kept in confidence; however, a copy of the research report will be made available to your office.

For further inquiry, the contact details are as follows:

The researcher: Maja N.M.

Cell number: 076 195 4004

Email address: noriah.maja@gmail.com

Supervisor: Prof Makhado L.

Email address: lufuno.makhado@univen.ac.za

Co-supervisor: Dr Tshivhase S.E.

Thanking you in advance.

Signature

Date

Appendix C2 Letter to request Permission (Polokwane Hospital)

PO BOX 5404
Polokwane North
0750

Enquiries: Maja N.M.

Cell No: 076 195 4004

Email address: noriah.maja@gmail.com

Supervisor: Prof. Makhado L.

Email address: lufuno.makhado@unive.ac.za

To: The Chief Executive Officer

Request for permission to conduct a research study in Polokwane Hospital-in Capricorn district, Limpopo Province, South Africa.

I Noria Madithapo Maja registered student for Master of Public Health (MPH), at the University of Venda. I hereby request to conduct a research study in Polokwane Hospital in Capricorn District, Limpopo Province. The study title stated as **“The psychosocial impact of Coronavirus (COVID-19) pandemic on Nurses working at a selected tertiary hospital in Limpopo Province, South Africa”**.

The hospital is selected based on its exposure in dealing with COVID -19 Cases in the district. It is one of the first hospitals in the district found with the first case of COVID-19 amongst the Health Care Workers (Doctor). The case overwhelmed most Health Care Workers, especially those who were in contact with the patient prior to the test. It is for this reason the hospital is identified as the appropriate setting for this study.

It is predicted that the study will contribute towards improving the health and safety of the Health Care workers while caring for those who are infected and affected by COVID -19.

The researcher undertakes to observe all ethical principles for conducting the research. All information to be acquired will be kept in confidence; however, a copy of the research report will be made available to your office.

For further inquiry, the contact details are as follows:

The researcher: Maja N.M.

Cell number: 076 195 4004

Email address: noriah.maja@gmail.com

Supervisor: Prof Makhado L.

Email address: lufuno.makhado@univen.ac.za

Co-supervisor: Dr Tshivhase S.E

Thanking you in advance.

Signature

Date

APPENDIX D: LETTER OF INFORMATION

RESEARCH ETHICS COMMITTEE

UNIVEN Informed Consent

Title of the Research Study : **The psychosocial impact of Coronavirus (COVID-19) pandemic on Nurses working at a selected tertiary hospital in Limpopo Province, South Africa.**

Principal Investigator/s/ researcher : Maja N.M (PGDM)

Co-Investigator/s/supervisor/s : Prof Makhado L.
: Dr Tshivhase S.E

Brief Introduction and Purpose of the Study:

The outbreak of the Coronavirus (COVID-19) has posed massive threat and anxiety to everyone in the country. The rate of the COVID-19 cases was increasing daily especially amongst the health care workers across the country. The purpose of the study is to describe and explore the psychosocial impact of Coronavirus amongst the Nurses working at the selected hospital in Capricorn District, Limpopo Province, South Africa.

Outline of the Procedures

The study is qualitative in nature, using Exploratory descriptive designs. The study will be conducted in Polokwane hospital in Capricorn District, Limpopo Province, South Africa. This study will employ non –probability sampling, using a purposeful sampling technique to select 20 nurses to participate in the study. Semi-structured in-depth interviews will be used as a method to collect data, with the interview guide as a tool. The study will take about 40-60 minutes to engage participants while collecting data. The researcher will analyse data by using the thematic analysis method in qualitative research and will further compile the findings to be presented at relevant forums.

Risks or Discomforts to the Participant: For this study, there is no risk anticipated while collecting data.

Benefits

The chosen phenomenon is new; therefore, the study will lay the foundation for future studies. This study anticipates massive contribution to the determination of effective measures to promote and protect the health and safety of the Health Care Workers, mostly the nurses.

Reason/s why the Participant May Be Withdrawn from the Study:

One of the key principles of ethics in research is to respect human rights, therefore the participants will be assured that they are allowed to withdraw from the study as and when they feel is necessary to do so because participation is on voluntary choice.

Remuneration

Participants will not receive any form of remuneration during and after the study.

Costs of the Study

Participants will not be liable to pay any cost for the study.

Confidentiality

The researcher must ensure confidentiality throughout the research process, therefore, in this study, the researcher will ensure that the information acquired is kept safe and will remain anonymous.

Research-related Injury: for this study, there are no injuries anticipated during the data collection period.

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

Please contact the researcher Maja N.M at 076 195 4004, my supervisor Prof. Makhado L. at 061 147 2002 or the University Research Ethics Committee Secretariat on 015 962 9058. Complaints can be reported to the Director: Research and Innovation, Prof GE Ekosse on 015 962 8313 or Georges Ivo.Ekosse@univen.ac.za

General:

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

CONSENT

Statement of Agreement to Participate in the Research Study:

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

Full Name of Participant	Date	Time	Signature
I, Noria Madithapo Maja

(*Name of the researcher*) herewith confirm that the above participant has been fully Informed about the nature, conduct and risks of the above study.

Full Name of Researcher

Noria Madithapo Maja Date..... Signature.....

Full Name of Witness (If applicable)

..... Date Signature.....

Full Name of Legal Guardian (If applicable)

..... Date..... Signature.....

Please note the following:

Research details must be provided in a clear, simple and culturally appropriate manner and prospective participants should be helped to arrive at an informed decision by use of appropriate language (grade 10 level- use Flesch Reading Ease Scores on Microsoft Word), selecting of a non-threatening environment for interaction and the availability of peer counseling (Department of Health, 2004)

If the potential participant is unable to read/illiterate, then a right thumb print is required and an impartial witness, who is literate and knows the participant e.g. parent, sibling, friend, pastor, etc. should verify in writing, duly signed that informed verbal consent was obtained (Department of Health, 2004).

If anyone makes a mistake completing this document e.g. a wrong date or spelling mistake, a new document has to be completed. The incomplete original document has to be kept in the participant's file and not thrown away, and copies thereof must be issued to the participant.

References:

Department of Health: 2004. *Ethics in Health Research: Principles, Structures and Processes*

<http://www.doh.gov.za/docs/factsheets/guidelines/ethnics/>

Department of Health. 2006. *South African Good Clinical Practice Guidelines*. 2nd Ed. Available at:

http://www.nhrec.org.za/?page_id=14

Appendix E: INTERVIEW GUIDE

Section A

- Age.....
- Highest education level:.....
- Occupation:.....
- Years of Experience:.....

Section B

1. What is the Psychosocial impact of COVID-19 on Nurses?

Appendix F: Author Guidelines

International Journal of Africa Nursing Sciences (IJANS) Elsevier.



Introduction

Dr Hester Klopper, Editor, welcomes manuscripts for consideration for publication in the journal.

Submission checklist

You can use this list to carry out a final check of your submission before you send it to the journal for review. Please check the relevant section in this Guide for Authors for more details.

Ensure that the following items are present:

One author has been designated as the corresponding author with contact details:

- E-mail address
- Full postal address

All necessary files have been uploaded:

Manuscript:

- Include keywords
- All figures (include relevant captions)
- All tables (including titles, description, footnotes)
- Ensure all figure and table citations in the text match the files provided
- Indicate clearly if color should be used for any figures in print

Graphical Abstracts / Highlights files (where applicable)

Supplemental files (where applicable)

Further considerations

- Manuscript has been 'spell checked' and 'grammar checked'
- All references mentioned in the Reference List are cited in the text, and vice versa
- Permission has been obtained for use of copyrighted material from other sources (including the Internet)

- A competing interests statement is provided, even if the authors have no competing interests to declare
- Journal policies detailed in this guide have been reviewed
- Referee suggestions and contact details provided, based on journal requirements

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Before You Begin

Ethics in publishing

Please see our information pages on [Ethics in publishing](#) and [Ethical guidelines for journal publication](#).

The IJANS is a signatory journal to the Uniform Requirements for Manuscripts Submitted to Biomedical Journals, issued by the International Committee for Medical Journal Editors (ICMJE), and to the Committee on Publication Ethics (COPE) code of conduct for editors. Our guidelines should be read in conjunction with this broader guidance. The ICMJE requirements can be found at <http://www.icmje.org/> and the COPE's guidelines at http://publicationethics.org/files/u2/New_Code.pdf.

Studies in humans and animals

If the work involves the use of human subjects, the author should ensure that the work described has been carried out in accordance with [The Code of Ethics of the World Medical Association](#) (Declaration of Helsinki) for experiments involving humans. The manuscript should be in line with the [Recommendations for the Conduct, Reporting, Editing and Publication of Scholarly Work in Medical Journals](#) and aim for the inclusion of representative human populations (sex, age and ethnicity) as per those recommendations. The terms [sex and gender](#) should be used correctly.

Authors should include a statement in the manuscript that informed consent was obtained for experimentation with human subjects. The privacy rights of human subjects must always be observed.

All animal experiments should comply with the [ARRIVE guidelines](#) and should be carried out in accordance with the U.K. Animals (Scientific Procedures) Act, 1986 and associated guidelines, [EU Directive 2010/63/EU for animal experiments](#), or the National Research Council's [Guide for the Care and Use of Laboratory Animals](#) and the authors should clearly indicate in the manuscript that such guidelines have been followed. The sex of animals must be indicated, and where appropriate, the influence (or association) of sex on the results of the study.

Informed consent and patient details

Studies on patients or volunteers require ethics committee approval and informed consent, which should be documented in the paper. Appropriate consents,

permissions and releases must be obtained where an author wishes to include case details or other personal information or images of patients and any other individuals in an Elsevier publication. Written consents must be retained by the author but copies should not be provided to the journal. Only if specifically requested by the journal in exceptional circumstances (for example if a legal issue arises) the author must provide copies of the consents or evidence that such consents have been obtained. For more information, please review the [Elsevier Policy on the Use of Images or Personal Information of Patients or other Individuals](#). Unless you have written permission from the patient (or, where applicable, the next of kin), the personal details of any patient included in any part of the article and in any supplementary materials (including all illustrations and videos) must be removed before submission.

Declaration of competing interest

Corresponding authors, on behalf of all the authors of a submission, must disclose any financial and personal relationships with other people or organizations that could inappropriately influence (bias) their work. Examples of potential conflicts of interest include employment, consultancies, stock ownership, honoraria, paid expert testimony, patent applications/registrations, and grants or other funding. All authors, including those *without* competing interests to declare, should provide the relevant information to the corresponding author (which, where relevant, may specify they have nothing to declare). Corresponding authors should then use [this tool](#) to create a shared statement and upload to the submission system at the Attach Files step. **Please do not convert the .docx template to another file type. Author signatures are not required.**

Submission declaration and verification

Submission of an article implies that the work described has not been published previously (except in the form of an abstract or as part of a published lecture or academic thesis or as an electronic preprint, see '[Multiple, redundant or concurrent publication](#)' section of our ethics policy for more information), that it is not under consideration for publication elsewhere, that its publication is approved by all authors and tacitly or explicitly by the responsible authorities where the work was carried out, and that, if accepted, it will not be published elsewhere in the same form, in English or in any other language, including electronically without the written consent of the copyright-holder. To verify originality, your article may be checked by the originality detection service [CrossCheck](#).

Acknowledgements

One or more statements should specify (a) contributions that need acknowledging, but do not justify authorship (b) acknowledgments of technical support (c) acknowledgments of financial and material support, specifying the nature of the support. Persons named in this section must have given their permission to be named. Authors are responsible for obtaining written permission from those acknowledged by name since readers may infer their endorsement of the data and conclusions. Authors should include Acknowledgments in the Conflict of Interest statement at original submission stage, and will be required to transfer the Acknowledgments into the manuscript file for revised articles.

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Use of inclusive language

Inclusive language acknowledges diversity, conveys respect to all people, is sensitive to differences, and promotes equal opportunities. Content should make no assumptions about the beliefs or commitments of any reader; contain nothing which might imply that one individual is superior to another on the grounds of age, gender, race, ethnicity, culture, sexual orientation, disability or health condition; and use inclusive language throughout. Authors should ensure that writing is free from bias, stereotypes, slang, reference to dominant culture and/or cultural assumptions. We advise to seek gender neutrality by using plural nouns ("clinicians, patients/clients") as default/wherever possible to avoid using "he, she," or "he/she." We recommend avoiding the use of descriptors that refer to personal attributes such as age, gender, race, ethnicity, culture, sexual orientation, disability or health condition unless they are relevant and valid. When coding terminology is used, we recommend to avoid offensive or exclusionary terms such as "master", "slave", "blacklist" and "whitelist". We suggest using alternatives that are more appropriate and (self-) explanatory such as "primary", "secondary", "blocklist" and "allowlist". These guidelines are meant as a point of reference to help identify appropriate language but are by no means exhaustive or definitive.

Reporting sex- and gender-based analyses

Reporting guidance

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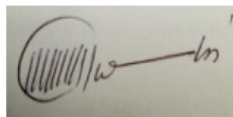
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