

**SELF-REGULATION AND COPING AS PREDICTORS OF MENTAL HEALTH CONCERNS AMONG
PRIMARY HEALTHCARE NURSING STAFF DURING THE COVID-19 PANDEMIC**

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ABSTRACT

There is a growing awareness within healthcare systems of the need to better understand the mental health concerns of frontline workers, who faced a myriad of work-related stressors in the aftermath of the COVID-19 outbreak. Self-regulation and coping have been widely accepted as integral processes in supporting mental health. This study explored the contribution of self-regulation and coping of primary healthcare nurses from the Lejweleputswa district of the Free State to their reported experiences of anxiety, depression, and stress. Furthermore, it explored its relationship to demographic variables, such as age, gender, work experience and degree of exposure to COVID-19. A total of 146 ($N=146$) participants completed the *Short Self-Regulation Questionnaire*, the 21-item *Depression, Anxiety and Stress Scale (DASS-21)*, and the *Coping Orientations to Problems Experienced (COPE) Questionnaire*. Pearson product-moment coefficient correlations, analyses of variance and hierarchical regression analyses were used to analyse the data. Previous SARS-CoV-2 testing was reported by 86.3% of participants, and 63% reported testing positive for COVID-19 at some point during the pandemic. Most (79.5%) indicated that they had lost a relative or colleague due to COVID-19. DASS-21 results indicated a mean score suggesting moderate depressive symptoms ($\bar{x} = 14.45$), severe anxiety symptoms ($\bar{x} = 15.0$) and a mild level of stress ($\bar{x} = 16.745$). In addition, male participants obtained a significantly higher mean score on depression than the female nurses, whilst female participants nurses obtained a significantly higher mean score on creativity. Results indicated a moderately strong negative relationship between all the measured mental health concerns (depression, anxiety and stress) and the self-regulation strategies of persistence (-0.37, -0.33 and -0.37, respectively) and mindfulness (-0.33, -0.32 and -0.30). Furthermore, similar negative relationships with decision-making were found for both

anxiety (-0.32) and stress (-0.32). Coping scales failed to explain a significant percentage of variance in depression, anxiety, and stress, while a significant percentage of the variance in all mental health concerns could be explained by self-regulation. This study provides valuable insights into the role of self-regulation as a predictor of mental health among primary healthcare nurses and highlights it as a potential target for the promotion of mental health among healthcare workers (HCWs) by encouraging self-care and training them in resilience and burnout prevention.

Keywords: healthcare workers, primary healthcare, nursing, mental health, self-regulation, coping, depression, anxiety, stress, COVID-19.

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CHAPTER ONE

INTRODUCTION AND ORIENTATION TO THE STUDY

1.1 Introduction

This chapter provides a comprehensive overview of and orientation to the study. It highlights the background against which the research was designed and conducted, providing the motivation and rationale for this study, and giving a clear view of the problem statement. Thereafter, the research goals, objectives and questions are presented, followed by an overview of the research methodology and a discussion of the ethical considerations relevant to this study. The value of the study, as well as an overview of the layout of this dissertation, conclude this chapter.

1.2 Background and Problem Statement

The uncertainties that accompanied the COVID-19 pandemic since its 2019 outbreak caused widespread anxiety, especially for those living with pre-existing health conditions (Robertson et al., 2020). COVID-19, arising from the spread of SARS-CoV-2 infections, soon placed tremendous pressure on healthcare systems worldwide (World Health Organization, 2020) and resulted in psychological distress for both the general population (Govender, 2020; Nguse & Wassenaar, 2021; Novacek et al., 2020; Orkin et al., 2020), as well as healthcare workers (HCW's) (Halcomb et al., 2020; Liu & Wang, 2020; Ramlagan et al., 2024; Sirois & Owens, 2020; Yildirim et al., 2020).

During the initial outbreak and throughout the course of the COVID-19 pandemic, HCWs found themselves particularly vulnerable to COVID-19 morbidity and mortality, due to numerous factors such as inconsistent access to personal protective equipment (PPE) and poor infection control in some clinical areas, work overload, and preexisting medical

conditions which placed them at risk for the development of COVID-19 when infected (Herron et al., 2020; Mhango et al., 2020; Robertson et al., 2020). A study by Tlotleng et al. (2022) reported that 6364 HCWs in South Africa were admitted with COVID-19 during the first wave of infections; most of these were above the age of 30 years and had existing vulnerabilities such as asthma and obesity. Of these HCWs, 603 died, with the mortality rate increasing with age. The mortality rate also increased with the occupational category; for example, doctors had a higher mortality rate when compared to non-medical healthcare staff, such as porters and administrators, owing to their higher levels of direct patient contact and the resultant viral exposure (Tlotleng et al., 2022).

In addition to an increased risk of infection, HCWs also experienced a COVID-19-related rise in mental health concerns, which many attributed to the increased stressors in their work environment and concerns over their well-being (Billings et al., 2021; Halcomb et al., 2020; Herron et al., 2020; Liu & Wang, 2020; Ramlagan et al., 2024). Globally, research revealed that HCWs were at an increased risk for anxiety and depression (Pappa et al., 2020; Robertson et al., 2020; Yildirim et al., 2020), as well as post-traumatic stress (Song et al., 2020). Early Chinese studies revealed significant mental health challenges, with one study estimating that one-sixth of hospital-based HCWs suffered from psychological problems, of which only 35% sought treatment (Liu & Wang, 2020). Another study found around half of ICU nurses were experiencing problems with sleeping and appetite, while around a quarter reported nervousness and frequent crying (Shen et al., 2020).

Depression, anxiety, post-traumatic stress, somatisation, insomnia, and other mental health conditions were also found among South African HCWs exposed to COVID-19 (Engelbrecht et al., 2021; Lee et al., 2022; Stals et al., 2024). Similarly, Ramlagan et al. (2024)

reported that of their 7 607 participants, half of the nursing staff (50.3%), below half of medical practitioners (40.6%) and almost half (47.4%) of healthcare professionals from other categories classified as distressed. South Africa's healthcare professionals working in a tertiary hospital experienced high levels of mental health disturbance during the early COVID-19 pandemic (Lee et al., 2022), indicating a need for educational, and supporting initiatives should be implemented affirmatively to prevent psychological distress and improve mental health outcomes among HCWs (Lee et al., 2022).

Internationally, among all categories of HCWs, the primary healthcare medical staff were specifically at significant risk of both infection and COVID-19-related stress during the pandemic (Sart et al., 2020). Nurses and HCWs in outpatient clinics were found to be particularly vulnerable to increased psychological distress when compared to hospital-based workers (Chersich et al., 2020; De Kock et al., 2021; Halcomb et al., 2020; Yildirim et al., 2020). Such frontline HCWs reported experiencing significant negative impacts on their mental and physical wellness, such as depression, stress, anxiety and fear of infection and death (Mahlangu et al., 2023).

Research has highlighted some of the specific concerns that confronted this group of HCWs (Halcomb et al., 2020; Herron et al., 2020; Iddrisu et al., 2023; Shanafelt et al., 2020; Shechter et al., 2020): (a) An increased perception of job insecurity, (b) worry about falling ill themselves or infecting loved ones, (c) as well as inadequate access to childcare and social support and (d) insufficient PPE supply. The experience of role conflicts between the increased demands of work and family life was identified as a key factor in influencing well-being among nursing staff (Billings et al., 2021). Frontline HCWs reported that their confidence in the quality of care they felt could provide during the pandemic, as well as how

well they coped with stress, were affected by these new concerns (Herron et al., 2020; Iddrisu et al., 2023; Shanafelt et al., 2020; Shechter et al., 2020). Iddrisu et al. (2023) concluded that the psychological problems reported by HCWs in the nursing category included increased stress, burnout in the form of emotional exhaustion and experiences of depersonalisation, depression, anxiety, post-traumatic stress symptoms and insomnia, which was attributed to their increased exposure to witnessing the loss of life and the frequently reported sense of a loss of control in the situation. Furthermore, nurses experienced social challenges in that they were separated from their families while working long hours and felt increased stress regarding their duties (Iddrisu et al., 2023).

To better understand the potential impact of demographic variables and workplace exposure on anxiety and depression among HCWs, Yildirim et al. (2020) assessed HCWs in Turkey. Results indicated significantly higher anxiety and depression among HCWs who worked in outpatient clinics compared to other hospital-based workers with lower levels of infection exposure (Yildirim et al., 2020). Furthermore, female participants, younger HCWs and those who were single, divorced or widowed, reported higher depression and anxiety scores (Yildirim et al., 2020).

In addition to the stressors inherent to the nursing profession, large disease outbreaks can have destructive psychological and physiological effects and long-term adverse consequences such as poor health outcomes, absenteeism, reduced performance, and impaired emotional functioning (Halcomb et al., 2020; Nowrouzi-Kia et al., 2024). In South Africa, measures to contain and respond to the pandemic, including state of emergency conditions and strict infection prevention and control guidelines in healthcare facilities, placed additional pressure on healthcare services, such as increased workloads

and resource scarcity, all with the potential to affect nurses negatively (Mbunge, 2020).

Therefore, the impact of the outbreak on nurse practitioners can be assumed to have been especially noticeable among those working in frontline situations in outpatient clinics where new patients were attended to daily.

Exposure to high work-related stress holds implications for an individual's health as well as the well-being of organisations (Ganster & Rosen, 2013). At the individual level, work-related stress may lead to a decline in numerous health indicators, including psychological (i.e., experiencing more anxiety, depression, distress, exhaustion, and burnout) and physiological indicators (i.e., experiencing more pain, increasing risk for cardiovascular disease, etc.), as well as an increase in negative health behaviours (such as substance use and a greater reliance on prescription medications) (Ganster & Rosen, 2013; Sirois & Owens, 2020). At an organisational level, work-related stress may lead to high levels of absenteeism, decreased performance and productivity, poor motivation, and low morale (Ganster & Rosen, 2013; Nowrouzi-Kia et al., 2024; Sirois & Owens, 2020).

The COVID-19 pandemic and its aftermath are expected to continue to place additional burdens on the coping and self-regulation of nurses in primary healthcare settings (Shanafelt et al., 2020) as they serve as a point of entry for medical care for the majority of COVID-19 cases (Sart et al., 2020). Therefore, primary healthcare would have played an important role in the identification of COVID-19 patients, placing HCWs there at greater risk of exposure and increased occupational stress. As communities rely heavily on HCWs during pandemics, a better understanding of their mental health needs is essential (Hobart & Kneese, 2020). In proposing that a focus on nurses' mental health is a necessity in future pandemic responses, the International Council of Nurses recognised both the

significant role of nurses in the fight against infectious disease outbreaks as well as their increased vulnerability to the psychological impact of rendering services during such times (Millar, 2020). Furthermore, psychological distress has persisted beyond the active pandemic response, with a recent study reporting that PTSD-like symptoms have remained prevalent, with just over a quarter of Chinese nurses affected (Mao et al., 2023).

Longitudinal studies revealed a number of factors that influence the trajectory of mental health findings over the course of the pandemic among HCWs, with significant worsening of psychological distress, anxiety and depression noted for some, while others showed positive changes (Umbetkulova et al., 2024). The deterioration of HCWs' mental health seemed to be influenced by numerous factors. Being of the female gender, younger in age, working in the nursing category, as well as working on the frontline and reporting feeling overworked and vulnerable to coronavirus infection were all identified as risk factors for mental health deterioration over the course of the pandemic (Umbetkulova et al., 2024).

This study's focus centres on the further exploration of two variables that are potentially important in studying the impact that the COVID-19 pandemic has had on the mental health of HCWs, namely coping and self-regulation. Several recent studies into HCWs' mental health have been aimed at exploring their coping strategies in the context of the COVID-19 pandemic (Nowell et al., 2021; Shechter et al., 2020; Yildirim et al., 2020). Nurses' confidence in their own coping was found to be central to their emotional experience of working during the pandemic (Nowell et al., 2021). Additionally, they expressed an interest in accessing mental health services (Nowell et al., 2021; Shanafelt et al., 2020; Shechter et al., 2020), with one study reporting that over 80 % of participants expressed the belief that HCWs should receive counselling routinely during the pandemic

(Ramlagan et al., 2024), potentially indicating a subjective need for improving their ability to cope.

Effective coping behaviours have been associated with a greater likelihood of desired outcomes (occupational success, a sense of mastery and competence, as well as good overall health), while deficient or underutilised coping behaviours have been associated with more undesired outcomes, such as the use of substances, health-risk behaviours, burnout, and suicidal behaviour (Zimmer-Gembeck & Skinner, 2008). According to early coping theorists, Lazarus and Folkman (1984), coping represents cognitive and behavioural efforts that individuals use to manage stress and can be categorised as either emotion-focused or problem-focused coping. Coping abilities impact one's short-term adaptive functioning and how well a person can relieve emotional distress, as well as how they manage their physical and mental health in the long term (McFadden et al., 2021; Reeck et al., 2016; Skinner et al., 2013; Strait et al., 2020). Engelbrecht et al. (2021) were the first to explore the coping strategies of South African nurses across different healthcare settings during COVID-19 in the Free State, with results showing that 44% of nurses screened positive for post-traumatic stress disorder (PTSD), with an avoidant coping style being associated with higher reports of PTSD symptomology.

Secondly, self-regulation has emerged as an important mediator in coping strategies, health behaviours and mental health concerns (Cloete et al., 2012; Docherty, 2019; Tlotleng et al., 2021). Self-regulation refers to the monitoring and adaptation of feelings, cognitions, and behaviours to achieve one's goals and maintain healthy functioning (Chen & Jang, 2019), has been proposed to moderate the relationship between work-family conflict and the nurse's quality of work-life (Boogar et al., 2018). Self-regulation skills may, therefore, be

important potential targets for the improvement of the quality of work life of nurses, especially given the reports of significant additional work-life role conflicts brought about by the pandemic (Shanafelt et al., 2020; Shechter et al., 2020). Self-regulation theorists have proposed that the process entails receiving information, evaluating information by making a comparison to norms, triggering changes, searching for options or alternatives, formulating a plan and assessing its effectiveness after implementation (Miller & Brown, 1991).

Mahlangu et al. (2023) emphasised the need to bolster continual and structured workplace psychosocial support to enhance frontline workers' self-efficacy, resilient coping and agility when dealing with a life-threatening and infectious novel virus under rapidly changing work environments. De Kock et al. (2021) emphasised the potential of systemic support and risk reduction measures, adequate staff training and individual resilience to buffer against adverse mental health outcomes for HCWs during the pandemic. Workplace interventions should focus on psychological well-being, as well as optimise occupational and environmental protective factors (De Kock et al., 2021) and can include routine mental health support, counselling services, continuous debriefing (Mahlangu et al., 2023), access to psychological information, sufficiency of PPE and access to COVID-19 testing (Umbetkulova et al., 2024).

During the researcher's collaboration with nursing staff in rendering community-based healthcare programmes in the Lejweleputswa District, the need to better understand nurses' mental health concerns from which to develop mental health interventions suited for local HCWs, became apparent. To design tailored mental health interventions for nurses, a better understanding of their self-regulation and their ways of coping may be a useful avenue for exploration. For this reason, this research will seek to contribute to occupational

health initiatives for HCWs and current South African research regarding how nurses cope with their workplace pressures since the outbreak of the pandemic and regulate themselves, by exploring the relationship between mental health on the one hand and their coping and self-regulation on the other.

1.3 Research Aim

The primary aim of this study is to determine the extent to which self-regulation and coping contribute to the variance in the reported experience of mental health concerns among primary healthcare nursing staff. Secondly, this study aims to understand the unique contributions of the components of self-regulation (assessing, evaluating, implementing, planning, receiving, searching, and triggering), as well as the components of coping, (emotion-focused coping, problem-focused coping, and dysfunctional coping), to the participant's reported mental health concerns. Lastly, a final aim is to investigate the role, if any, played by demographic variables, such as age, gender, and work experience in their current occupational role.

1.4 Research Questions

Informed by the research aim described above, the following questions were formulated for the purpose of this study:

- What are the possible roles of self-regulation and coping in the experience of mental health concerns?
- To what extent do self-regulation and coping contribute to the variance in the reported experience of mental health concerns among primary healthcare nursing staff?

- What is the role played by demographic variables, such as age, gender and work experience in coping and self-regulation, stress, anxiety, and depression in current occupation?

1.5 Methodology

1.5.1 Study Design

A quantitative, non-experimental design (Fischer et al., 2023) was used in this study. De Vos et al. (2011) defined quantitative research as data that is captured in a numerical format and subjected to statistical types of analysis. It explains a phenomenon by collecting data that is analysed using mathematically based methods (Choy, 2014). Furthermore, quantitative research aims to measure the world objectively and tests hypotheses, as the researcher is detached (De Vos et al., 2011), and uses empirical methods and statements (Creswell, 2017).

A non-experimental research design seeks to identify the relationships between characteristics (Fischer et al., 2023), which in the context of this study is the mental health of nurses on the one hand and their self-regulation and coping on the other. A non-experimental research design is described by Bonds-Raacke and Raacke (2014) as being reliant upon observations about how variables relate to one another, instead of on the manipulation of those variables. A cross-sectional observational design entails that the researcher measures the outcome and the exposures in the study at the same time (Setia, 2016). Correlational designs allow for the comparison of statistical data in explaining human relationships in a large population (Fischer et al., 2023; Terre Blanche et al., 2016). In this study, a non-experimental and cross-sectional correlational design is used to investigate the relationship between self-regulation, coping and the mental health of nurses.

1.5.2 Research Participants and Sampling

A non-probability convenience sampling technique was used to answer the research questions. Primary healthcare clinics situated within the Matjhabeng sub-district of Lejweleputswa in the Free State province were targeted in this study for participant recruitment. Participants were selected through a non-probability, convenience sampling technique (Wilson & MacLean, 2011), using the following inclusion criteria: a) employed as a nursing staff member by the Free State Department of Health at a Primary Healthcare Clinic in the Lejweleputswa district, and b) having worked the facility for any amount of time during the COVID-19 pandemic. The nurses working in these clinics were informed of the study by the flyers distributed in the clinics. The participants were recruited through the distribution of information documents (Appendix C) at the clinics in the Lejweleputswa district, which informed them of the research. Potential participants received information documents, and the data collection measures upon providing their written consent to participate.

Approximately 230 nursing staff work throughout 39 primary healthcare clinics in the Lejweleputswa District (N. Lefu, personal communication, 11.09.2021). To determine the minimum size of the study sample to ensure a representative sample that would allow the researcher to make accurate generalisations about the larger group (Neuman, 2011), the following formula was applied:

$$\text{Sample size} = \frac{\frac{z^2 \times p(1-p)}{e^2}}{1 + \left(\frac{z^2 \times p(1-p)}{e^2 N} \right)}$$

Therefore, a target was set for recruiting 146 participants, needed when applying a confidence interval of 95%.

1.5.3 Data Collection Procedures and Measuring Instruments

Demographic data, data on mental health concerns, as well as data on coping styles and self-regulation strategies, were collected from a sample of 146 nurses working in the clinics who volunteered to take part in the study. The instruments that were used for data collection are described briefly in the following sections.

1.5.3.1 Demographic Questionnaire

A self-compiled demographic questionnaire was used to collect data on the age, gender, and work experience of participants for later analysis of their role in self-regulation, coping, or the experience of mental health concerns. The questionnaire was compiled by the researcher and included eight questions about the participants' age, gender, and ethnicity, as well as context-based questions such as years of experience working in the clinics, co-morbidities, and previous exposures to COVID-19.

1.5.3.2 Shortened Self-Regulation Questionnaire

The Shortened Self-Regulation Questionnaire (SSRQ) (Aubrey et al., 1994; Carey et al., 2004) was used to assess self-regulation. The self-report questionnaire consists of 31 items and 7 subscales of different self-regulation strategies, namely monitoring, decision making, learn from mistakes, persistence, creativity, self-evaluation and mindfulness (Potgieter & Botha, 2009). Scoring was done by summing the numerical values allocated to the response options that are provided in the form of Likert-type scales. In a South African investigation into its utility and psychometric properties, the SSRQ demonstrated

satisfactory reliability (Cronbach alpha of 0.895) and yielded a high degree of criterion-related validity through strong correlations for the total scale as well as the 7 subscales with various measures of psychological well-being, ranging from 0.560 to 0.697 (Potgieter & Botha, 2009). The subscales used in this study for further analysis were informed by previous South African studies conducted, these will be described further in Chapter 4.

1.5.3.3 Coping Orientations to Problems Experienced Questionnaire

The Coping Orientations to Problems Experienced Questionnaire (COPE) measures the participants' coping strategies through 14 subscales (Carver et al., 1989; Su et al., 2015). The subscales are grouped together into three broad categories, namely *Problem-focused Strategies*, *Emotion-focused Strategies*, and *Dysfunctional Strategies* (Du Plessis, 2012), which will be used in the study to obtain three COPE combined scores. For the problem-focused category score, the following subscales are included: *active coping*, *planning*, *suppression of competing activities*, *restraint coping* and *seeking social support for instrumental reasons*. The score for the emotion-focused category consists of the following subscales: *seeking social support for emotional reasons*, *positive reinterpretation and growth*, *acceptance*, *turning to religion* and *focus on and venting of emotions*. The subscales that comprise the dysfunctional coping category are *denial*, *behavioural disengagement*, *mental disengagement* and *alcohol-drug disengagement* (Carver et al., 1989; Du Plessis, 2012). Local research reported that the measure shows acceptable properties in cross-cultural South African contexts, with Cronbach alpha coefficients ranging between 0.86 and 0.89 (Du Plessis, 2012).

1.5.3.4 Depression, Anxiety and Stress Scale

For the measurement of mental health concerns, the shortened Depression, Anxiety and Stress Scale (DASS-21) was used. This 21-item version of the full Depression, Anxiety and Stress Scale was developed to measure the severity of symptoms of depression, anxiety, and stress in clinical settings (Coker et al., 2018). In an African study of Nigerian medical students, the reliability of the DASS-21 yielded a satisfactory Cronbach alpha coefficient (0.81) (Coker et al., 2018), suggesting that it might be an appropriate measure to use cross-culturally.

1.5.4 Statistical Procedures

Pearson's product-moment correlation was performed to analyse the relationship between mental health concerns, self-regulation, and coping strategies in primary healthcare nurses. Data analysis further investigated any significant differences between groups regarding demographic variables, such as gender, age, and years of experience. Hierarchical regression analyses (Beaudry & Miller, 2016; Creswell, 2013) were performed to investigate the contribution of self-regulation and coping, as well as their different components, as reported on the SSRQ and the COPE, to the experience of depression, anxiety and stress as identified by the DASS-21.

1.5.5 Ethical Considerations

Throughout the study, the researcher adhered to all the ethical guidelines as stipulated by the Health Professions Council of South Africa as well as by the University of the Free State, which provided ethical clearance through its Health Sciences Research Ethics Committee (HSREC), with the clearance number being HSD2022/0155/2607. Permission to conduct the study was also gained from the Free State Provincial Department of Health.

Potential participants should be well-informed of the benefits and risks associated with taking part beforehand (Creswell & Tashakkori, 2007) as a prerequisite for informed consent. To this end, information about the study was made available during the recruitment stage, and the researcher was available to answer any questions potential participants had prior to providing their written informed consent. Confidentiality and anonymity are key ethical principles that protect the privacy of participants in a study (Allen, 2017a) which is furthermore captured by the legislative requirements in the provisions of the Protection of Personal Information Act of 2013, which equally apply to research projects. In this study, participation was anonymised to ensure confidentiality by not requesting the participants to fill in their names in any of the forms but rather assigning participant numbers to completed forms instead for data management purposes. Participants were also allowed to complete the questionnaires at a time or place that allowed them to do so privately and completed questionnaires were submitted in sealed envelopes in a secure area at research sites to be collected by the researcher. Lastly, the principle of non-maleficence was applied to this study by adhering to the infection control processes in place at the study sites and developing mitigation strategies in the unlikely event of psychological distress, which will be described in detail in Chapter 4.

1.6 Value of the Study

It is envisaged that the findings from this study can contribute to the knowledge available regarding nurses' mental health during the COVID-19 pandemic, as well as a greater understanding of the role of their coping and self-regulation strategies. Furthermore, the contribution to the South African literature on the self-regulation, coping and mental health of nurses as frontline HCWs, can add to the currently limited knowledge on the mental health of nurses during COVID-19 in our local context.

1.7 Outline of the Chapters in the Dissertation

This dissertation comprises seven chapters. Chapter 1 provided the reader with an introduction and orientation to the study and included sections related to the problem statement, rationale and background of the study, the research questions, as well as the ethical considerations of the research and the value of the study. Chapter 2 provides an extensive literature review of the existing body of research regarding the psychological impact of COVID-19 on nursing practitioners, while Chapter 3 focuses on coping, self-regulation and its related concepts. Chapter 4 details the methodological procedures followed and implemented to obtain the research results, including the research design, the research objectives, the sample, data gathering procedures and measuring instruments as well as the statistical analysis procedures. Chapter 5 presents all the research findings of the study, while Chapter 6 encompasses a discussion of the results of the study in relation to the literature. Chapter 6 concludes the study by outlining the limitations of this research and highlighting the recommendations for future research.

CHAPTER TWO

THE MENTAL HEALTH IMPACT OF COVID-19 ON HEALTHCARE WORKERS

2.1 Introduction

This chapter presents an overview of the existing literature on psychological distress among healthcare workers (HCWs), particularly within the nursing field and specifically following the COVID-19 outbreak. To adequately contextualise this, this chapter first provides a brief overview of the mental healthcare landscape in South Africa, focusing on the impact of the COVID-19 pandemic. Thereafter, both international and South African research findings on the mental health concerns of nursing practitioners in the context of the pandemic's influence on mental health are provided.

2.2 Mental Healthcare in South Africa

Mental health is a position of well-being where a person is aware of their abilities, can cope with normal life stressors, can play an optimistic part in their community, and can work in a dynamic manner (WHO, 2018). Mental health has been recognised as a fundamental part of health (WHO, 2018), meaning that it cannot be excluded from complete health and well-being. Despite having policies and legislation in place for prioritising mental health care, such as the Mental Health Care Act of 2002, and the National Mental Health Policy Framework and Strategic Plan for 2013-2020, the South African Government has yet to bridge the continued gap between policy development and implementation (Nguse & Wassenaar, 2021). According to Docrat et al. (2019), mental health is treated as a less crucial part of the South African healthcare sector, with inadequate service delivery holding significant negative implications for people with mental health issues. Furthermore, when compared to other countries, South Africa still

experiences an unbalance in the ratio between biological/physical services and psychiatric/psychological services (Docrat et al., 2019; Nguse & Wassenaar, 2021; Truter, 2023), with implications for the safeguarding of the rights of those with mental illnesses (South African Human Rights Commission, 2019). There has been poor implementation of policies, as well as failures in the understanding of those policies created for mutual and community-level mental health care (Truter, 2023). This was particularly evident in the aftermath of the Life Esidimeni tragedy in 2016, when more than 118 individuals died after being deinstitutionalised (Truter, 2023). Despite these people's reliance on specialised psychiatric care, they were moved without oversight to community-based centres, where their neglect resulted in unnecessary suffering and death (Durojaye & Agaba, 2018). These events highlighted the need for improved, complete, and specialised care for people with mental illnesses (Mutsago et al., 2017).

A significant number of South Africans have unmet mental healthcare needs (Sorsdahl et al., 2023). For example, the South African College of Applied Psychology (2018) found that 40% of people receiving HIV treatment also present with psychiatric comorbidity, and 41% of women receiving prenatal care experience depressive symptoms that warrant clinical attention. However, not all who need such care receive it (Brown & Sprague, 2021; Burgess, 2016; Petersen et al., 2017; Sorsdahl et al., 2023). Only 27% of severely mentally ill South Africans are estimated to receive any treatment (South African College of Applied Psychology, 2018), and those who do receive treatment are not always retained (Sorsdahl et al., 2023).

Governance problems facing low- and middle-income countries, including South Africa, have a significant effect on the provision of quality integrated mental healthcare,

resulting in insufficient budget allocation to cater for the needs of mental healthcare patients (Petersen et al., 2017). Additionally, specific contexts may pose additional barriers. Burgess (2016) identified complexities that limit the access of women living with HIV to mental healthcare, such as power dynamics that impacted the equality of their treatment, the stigma surrounding mental illness and the silencing of women about their stressful experiences in the healthcare sector (Burgess, 2016). Several barriers to decent quality mental healthcare have also been identified within the perinatal care context (Brown & Sprague, 2021), such as a lack of training among healthcare staff, insufficient preparations and overcrowding in clinics, as well as sociocultural factors pertaining to different understandings of mental illness and stigma-related issues. Untrained staff and overcrowded conditions result in a failure to appreciate the importance of mental well-being in a clinical setting, resulting in missed opportunities for identifying and referring mental health concerns (Brown & Sprague, 2021). Benjamin et al. (2021) investigated the availability of mental health services in South African communities and concluded that a lack of resources, contextual barriers as well as stigma serve as barriers to mental healthcare, with services viewed as expensive, time-consuming, and inaccessible to rural communities.

Funding limitations remain a significant challenge in South African mental healthcare services, impacting both the quality of and accessibility to such services (Shisana et al., 2024; Sorsdahl et al., 2023). Funds for public sector healthcare services are allocated by the National Department of Health, while the private sector largely obtains funds from medical aid schemes, and NGOs fund their services largely through donations (Shisana et al., 2024). Within the public sector, every province manages their own budget for mental health services, often resulting in low allocations and an inability to meet the demand for mental healthcare in underdeveloped areas (Shisana et al., 2024). Although there has been an

improvement in mental health policing and legislation, an unequal distribution of mental healthcare resources between provinces still exists, which calls for interventions to improve policy implementation at the provincial level (Flisher et al., 2009). Researchers have emphasised the importance of meaningful public consultations during policy development relating to integrating mental healthcare services in healthcare settings, as policies should be amended to best suit those who utilise mental healthcare services (Marais et al., 2020; Petersen et al., 2017).

As healthcare systems respond to the outbreak of a pandemic, more attention is typically initially given to the physiological effects of the infections than its mental health implications, even though neglecting mental and socioeconomic factors has proven to be even more detrimental (Ornell, 2020). COVID-19 had a global impact on mental health (Dong & Bouey, 2020). Mental healthcare users identified poverty, domestic abuse, and heightened uncertainty as additional adversities during the pandemic, further compounding the psychosocial stressors they face (Holmes et al., 2020). A multidisciplinary team approach across biopsychosocial fields would, therefore, be necessary in dealing with the effects of the pandemic, especially in paying special attention to vulnerable people (Holmes et al., 2020). Grover et al. (2020), for example, emphasised that professionals in mental health be included and allocated in COVID-19 healthcare facilities. Ince and Minhas (2020) emphasised the importance of mental health professionals being included as part of multidisciplinary teams incorporated for disaster management when readying for disasters in the future. Additionally, calls have been made for mental healthcare services to be implemented broadly to provide support to workers in the healthcare profession and to benefit individuals with mental health complications (Marazziti, 2020; Marazziti & Stahl, 2020). Even though all sectors globally felt the impact of COVID-19, research has highlighted that

the pandemic had a significant negative impact specifically on those communities rendered powerless or insignificant (Novacek et al., 2020; WHO, 2020). For example, a relationship was found between individuals' psychological and economic distress, and ethnicity, gender and pre-pandemic unemployment in the United States, making these individuals even more vulnerable to the impact of COVID-19 (Breslau et al., 2020). Novacek et al. (2020), therefore, argued that intervention measures should be race-conscious and culturally competent if they are to resolve the ramifications of the COVID-19 pandemic.

Banerjee and Nair (2020) proposed a 7-step community-based tool kit to assist in dealing with the public and mental health impact of the coronavirus pandemic, specifically aimed at remedying the mental health effects of COVID-19. The steps are (1) gathering of information, (2) managing the crisis, (3) communication that is open and comprehensive, (4) showing care towards individuals, (5) obtaining support from relatives, (6) coming up with interventions that are at the community level as well as (7) reassigning different roles in organisations. Despite receiving criticisms for the lack of detail in their official communication, the Chinese government recognised and responded early on by establishing measures to address the mental health effects of the pandemic (Dong & Bouey, 2020). The lessons learnt during the COVID-19 pandemic have paved the way for improved global strategies aimed at providing support and raising awareness of the mental healthcare needs of both HCWs and service users (Heale & Wray, 2020; Torales et al., 2020).

Local research has confirmed the COVID-19 pandemic's significant effect on mental health in South Africa (Kim et al., 2020; Nguse & Wassenaar, 2021), with socioeconomic factors amplifying these effects in South Africa (Chothia, 2020; Human Sciences Research Council, 2020; Msomi, 2020; Orkin et al., 2020; Pillay & Barnes, 2020; Statistics South Africa,

2020). During the lockdown, South Africans reported significant feelings of loneliness, depression and fear (HSRC, 2020) and because of prevalent pre-existing biopsychosocial risk factors within the country, mental health concerns increased due to COVID-19 (Naidu, 2020). For example, a Soweto study concluded that the likelihood of people developing mood symptoms at the thought of COVID-19 infection was higher for those with a history of childhood trauma (Kim et al., 2020). Additionally, South African adults who reported greater COVID-19-related psychosocial stress were more likely to report suicidal ideation, with sleep quality having a mediating influence on the effect of COVID-19 on mental health and suicidal ideation (Kim, 2024).

Despite the increase in mental healthcare needs, however, the use of mental healthcare services decreased, with the number of mental health consultations in facilities significantly dropping during the lockdown periods (Govender, 2020; Wettstein et al., 2022). Access to mental health services became more difficult after the initial outbreak in South Africa, for both inpatient and outpatient healthcare users (Govender, 2020; Nguse & Wassenaar, 2021; Pillay & Barnes, 2020). Despite continued access to services being gazetted by the Government (Lockdown regulations, No.: 43232, April 2020), physical restrictions limited access of mental healthcare users to essential services (Pillay & Barnes, 2020). Patients were defaulting treatment due to the fear of infection, complications with transport and job loss (Pillay & Barnes, 2020). The decrease in both inpatient and outpatient mental health care consultations persisted over time, with lower consultation rates continuing even after restrictions have been lifted, resulting in associated complications such as a rise in alcoholic withdrawal syndromes (Wettstein et al., 2022). Furthermore, the South African government was criticised for the way it addressed COVID-19 patient care, with critics highlighting the challenges with the allocation of resources and attention to the

biomedical, instead of psychological, effects of the virus (Govender, 2020; Singh, 2020). Continued problems with provincial budget allocations and healthcare management, resulted in a failure to meet the growing healthcare needs, inadequate care for patients, a lack of facilities, especially primary healthcare facilities and a lack of resources (both physical and human) (Nguse & Wassenaar, 2021). Overall, the outbreak of the COVID-19 pandemic in South Africa worsened an already problematic situation that existed within the country (Nguse & Wassenaar, 2021).

2.3 The Mental Health of Healthcare Workers During COVID-19

Even during pre-pandemic times, HCWs have reported decreased psychological well-being and rising levels of work-related stress and burnout (Shanafelt et al., 2015; Watermeyer et al., 2023). Prior to the outbreak of SARS-CoV-2, burnout among physicians had already been labelled “an epidemic phenomenon” (Hauck & Gabbard, 2019, p. 191). One international study attributed 71% of occupational risks among HCWs to stress (Fernandes & Marziale, 2014).

The potential impact of work dissatisfaction and phenomena such as burnout among HCWs were found to include suboptimal healthcare services and lowered patient satisfaction (Mohanty et al., 2019). Sorenson et al. (2016) found compassion fatigue to contribute to burnout rates, resulting in afflicted healthcare professionals leaving their profession, or compromising HCWs’ ability to interact optimally with the patients under their care. In addition to lowered psychological well-being and an early exit from the profession, HCWs have furthermore been found to be at increased risk for mental health problems, such as depression, and increased suicide risk (Mohanty et al., 2019).

South African HCWs were also found to be vulnerable to mental health concerns (Hain et al., 2021; Rossouw et al., 2013). In the Cape Town Metropolitan Municipality, Rossouw et al. (2013) found that both depression and burnout were prevalent in community medical doctors. In Kwa-Zulu Natal, the problems with the retention of medical doctors in rural areas and their exit from their posts within two years were attributed to the high rates of burnout, depression and anxiety (Hain et al., 2021). South African nurses faced similar risks, with one study attributing high rates of burnout among psychiatric nurses to the demanding nature of patient care (Payne et al., 2020). Furthermore, they found that burnout levels were highest in the participants who had low job satisfaction, irrespective of any demographic variables such as age, gender, rank or work experience (Payne et al., 2020).

Not only did COVID-19 place healthcare systems under significant pressure, but HCWs themselves were now at risk for both infection and further mental health challenges (Herron et al., 2020; Robertson et al., 2020). During the COVID-19 pandemic, healthcare professionals were at the forefront of screening, testing and managing infected patients (Lee et al., 2022). A scoping review (Robertson et al., 2020) revealed that several mental health conditions were prevalent among HCWs who worked with COVID-19 patients, including depression, anxiety and symptoms of post-traumatic stress. Frontline workers reported emotional distress such as depression, fear and obsessive anxiety, which they attributed to COVID-19 (Hu et al., 2023).

Changes, especially during the first wave of COVID-19, left HCWs experiencing stress and challenges in adjusting to the uncertainties that came with changes in workload, new protocols and different ways of working (Watermeyer et al., 2023). The COVID-19 pandemic

has cultivated a feeling of uncertainty among HCWs (Koffman et al., 2020), not only due to the fear of infection but also the implications that the pandemic had on their socioeconomic standing (Nicola et al., 2020). Civita et al. (2021) concluded that healthcare professionals were rendered vulnerable to burnout because of stressful working conditions and the challenges of navigating personal stressors within the context of significant professional stressors. Ma et al. (2022) further explained that understaffing, resource shortages, overcrowding, massive workloads, physical and mental fatigue, and difficulty in balancing work and personal life demands contributed to healthcare professionals' burnout and precipitated their increased levels of depressive symptoms. Higher depression and anxiety scores were also found among HCWs who had to undergo isolation following viral exposure (Wand et al., 2020). Stress associated with COVID-19 was found to increase HCWs' anxiety levels, compromising their ability to regulate emotions and their work performance, potentially resulting in increased absenteeism rates (Millar, 2020).

Intolerance to uncertainty has been understood to increase worry in times of distress (Nicola et al., 2020). During COVID-19, increased levels of uncertainty intolerance correlated with rising reports of stress and anxiety (Nicola et al., 2020), which meant individuals' feelings of being uncertain about the future brought about anxiety and stress. Similarly, intolerance to uncertainty correlated with the coping strategies they utilised during the pandemic (Bongelli et al., 2021), where coping strategies were used to deal with feelings of uncertainty.

Burnout increased significantly among nurses in Cyprus during the third wave of COVID-19, and its impact, in turn, increased the rate of those resigning from their profession (Prodromou et al., 2023). Following the spread of the Delta variant, HCWs reported

increased worry-related experiences (Alhasan et al., 2021) and lack of control contributes to the development of anxiety disorders (Alhasan et al., 2021). South African HCWs reportedly experienced feelings of lack of support and felt unheard and uncared for by their employers, which compounded the impact of COVID-19 on nurses and doctors in a study done in Kwa-Zulu Natal by Dawood et al. (2022). Human et al. (2023) found that mental HCWs who had lower coping abilities exhibited more post-traumatic stress symptoms.

Olfson et al. (2023) observed that the risk of suicide was higher among HCWs when compared to non-HCWs, with registered nurses, healthcare support workers and health technicians at a higher risk compared to physicians. Other studies of nurses' mental health during the COVID-19 pandemic confirmed that nurses' mental health seemed to be particularly vulnerable (Yildirim et al., 2020). Yildirim et al. (2020) used the Health Anxiety Inventory (HAI) and Beck Depression Inventory (BDI) to investigate any differences in the scores between healthcare worker groups. Those who worked in outpatient clinics had significantly higher scores and nurses reported higher depression and anxiety scores compared with doctors, dentists, physiotherapists, technicians, and administrative staff. The prolonged hours that nursing practitioners spend in direct contact with patients in wards increase their perceived risk of contracting the virus (Di Trani et al., 2021). The mental health risks of nurses during COVID-19 could also be influenced by other risk factors, such as gender, age, and chronic illness comorbidity (Alamri et al., 2021; Gholami et al., 2021; Di Trani et al., 2021; Yildirim et al., 2020). Research has indicated that the pandemic had a detrimental psychological effect on not only HCWs in general (Gholami et al., 2021), but also on female workers (Alamri et al., 2021). As there was a higher number of female frontline HCWs on duty than men during COVID-19, the effects of the pandemic were mostly felt by women (Di Trani et al., 2021). A study by Yildirim et al. (2020), revealed higher anxiety and

depression scores were found among female participants, those between ages 20-30, those who smoke, and those with chronic illnesses. The primary healthcare sector seemed particularly vulnerable to COVID-19-related stressors. A study by Halcomb et al. (2020) concluded that nursing staff in primary health settings reported increased job insecurity and expressed concerns about the high risks to themselves and their families due to inadequate personal protective equipment and high degrees of occupational COVID-19 exposure. Furthermore, these perceptions influenced the quality of care (Halcomb et al., 2020). A study by Hamadi et al. (2021) concluded that nursing students struggled to achieve healthy coping strategies during the pandemic. Given the central role of nursing practitioners in the COVID-19 response, the International Council of Nurses emphasised the importance of meeting nurses' mental healthcare needs as a necessary component of the pandemic response (Millar, 2020).

The importance of identifying healthy coping strategies for HCWs during times of pandemics has been highlighted (Di Trani et al., 2021). HCWs' coping strategies are essential contributors to their mental well-being and sense of resilience (Di Trani et al., 2021). The use of emotion-focused coping or problem-focused coping among nurses showed that resilience was associated with emotion-focused coping, whilst psychological stress was associated with problem-focused coping (Iddrisu et al., 2023). Other factors, besides coping strategies, also seem to play a role in stress management. For example, frontline HCWs involved in direct patient care who reported more resilient coping during COVID-19, also reported less stress, while younger HCWs were more inclined to report elevated stress levels, likely associated with the younger HCWs' role and obligations to support their families financially and emotionally (Di Trani et al., 2021). A recent South African study on the well-being of primary healthcare nurses in Johannesburg showed feelings of unsafe

work environments, and emotional and psychological stress which resulted in poor health, the negative impact of home and community environments and the use of personal well-being strategies such as staying positive, self-motivation and family support in order to cope with the pandemic (Makhado et al., 2024).

2.4 Conclusion

Healthcare workers have always faced mental health risks due to the nature of their occupational demands. This chapter reviewed the recent research that highlighted the further impact of COVID-19 and provided a contextual outline of the challenges facing mental health provision in South Africa. The significant levels of stress that, particularly, primary HCWs are exposed to during pandemics, call for an improved understanding of the factors that impact this. The following chapter provides a discussion of two such factors, namely self-regulation, and coping.

CHAPTER THREE

COPING AND SELF-REGULATION

3.1 Introduction

This chapter provides a theoretical overview of coping and self-regulation as the variables under study, including the coping circumplex model and the temporal self-regulation theory, as well as their relevance to mental health research. Thereafter, South African research findings are presented on self-regulation and coping. This chapter concludes with a brief summary.

3.2 Conceptualisations of Coping

3.2.1 *Theoretical Origins*

Coping is defined by Lazarus and Folkman (1984) as reactions that result from an individual's mental and behavioural processes, which are influenced by the type of demand a person is faced with and whether the person can meet the demands or not. The reactions aim to tolerate, reduce or master these demands that put a strain on an individual (Botha & Du Plessis, 2012). Coping encompasses mental and behavioural processes that can be intentional or automatic and unconscious that act as a means of responding to stress (Compass et al., 2001; Lazarus & Folkman, 1984; Skinner & Welborn, 1994) and making the demands less impactful on the individual (Schafer et al, 2020). Lazarus and Folkman (1984) proposed that stress comprises three stages, namely primary appraisal (identifying a potential threat to oneself), secondary appraisal (anticipating a response to the potential threat) and, lastly, coping (the execution of the response to the threat).

The *Ways of Coping* (Folkman & Lazarus, 1988) measure was developed by Lazarus and it consists of predicates which indicate thoughts and actions that an individual may take when stressed (Folkman & Lazarus, 1980). The ways in which people cope has been distinguish into two, in which the first pays attention to the problem by means of solving the problem, and second focuses more on emotions by decreasing the emotional impact elicited by the problem (Folkman & Lazarus, 1980). It was evident that although most stressors influence both coping types, when one feels they can do something positive regarding their problem, they tend to favour problem-focused coping, but those who feel they need more perseverance, tend to rely on emotion-focused coping (Folkman & Lazarus, 1980).

In addition to the classification of problem-focused and emotion-focused coping, coping modes can be identified as either approach or avoidance coping strategies (Zimmer-Gembeck & Skinner, 2008). Approach strategies aim at minimising the problem, while avoidance ignores the problem together with its emotional ramifications. Avoidance is more passive as it requires an individual to disengage and escape the problem by turning away from it (Wang et al., 2007). Strategies such as denial and physically moving away from the problem are used and these leads to deteriorated mental health (Carroll, 2020). Emotion focused strategy was seen to be more beneficial in handling stress for women than men (Laghari et al., 2023).

Making use of the approach strategies on the contrary is beneficial as it is associated with positive outcomes as it aids positive adjustment (Wang et al., 2007). By approaching the problem, the individual can attempt to resolve the problem and seek support from others if needed (Zimmer-Gembeck & Skinner, 2008). People who make use of approach strategies navigate better with anxiety and depression (Wang et al., 2007). This means

individuals who deal with problems actively by approaching them have reduced risks of anxiety and depression and therefore good mental health (Zimmer-Gembeck & Skinner, 2008).

3.2.2 *The Development of the Coping Circumplex Model*

The abovementioned early developments in conceptualising coping faced criticism and rejection by different authors (Lazarus, 1996; Skinner et al., 2003). Carver et al. (1989) emphasised how simply viewing coping as focusing on the problems or emotions was conceptually limited and identified 13 dimensions of coping. These included five dimensions of problem-focused coping, namely (1) coping actively, (2) planning, (3) suppression of competing activities, (4) restraint coping, and (5) seeking social support for instrumental reasons), as well as 5 dimensions of emotion-focused coping, namely (1) striving for social support in order to feel better emotionally, (2) positive reinterpretation and growth, (3) acceptance, (4) denial, and (5) turning to religion. The last 3 dimensions were (1) focus on and venting of emotions, (2) behavioural disengagement, and (3) mental disengagement (Carver et al., 1989). Table 3.1 summarises the various categories and their definitions.

Table 3.1

A Summative overview of coping categories and their definitions

Coping Category	Coping Dimensions	Definition
PROBLEM FOCUSED COPING	Active Coping	Actively making the decision to make means to eradicate the stressor or minimise its effects on the individual.
	Planning	Exploring options on how to cope with the stressor by handling the problem.
	Suppression of competing activities	Putting aside other things that may interrupt dealing with the stressor in order to focus on the problem.
	Restraint coping	Ensuring that one acts at the right time in addressing a stressor.
	Seeking social support for instrumental reasons	Using guidance from others on how to deal with the stressor.
EMOTION FOCUSED COPING	Seeking social support for emotional reasons	Seeking approval from others.
	Positive reinterpretation and growth	Viewing the stressor in a positive manner that aids growth.
	Acceptance	Coming to terms with the stressor and accepting it.
	Denial	Not accepting to believe in the existence of the stressor.
	Turning to religion	Using one's religion to deal with stressors.
OTHER	Focus on and venting of emotions	Focusing on the feelings evoked by the stressor and exaggerating them.
	Behavioural disengagement	Giving up on the solving the stressor.
	Mental disengagement	Using other activities to distract oneself from the stressor.

Note. Adapted from “Assessing coping strategies: A theoretically based approach,” by C. S.

Carver, M. F. Scheier and J. K. Weintraub, 1989, *Journal of Personality and Social Psychology*, 56(2), 267–283. <https://doi.org/10.1037/0022-3514.56.2.267>

Parker and Endler (1992) expanded on this conceptualisation by using three coping categories, namely problem focused, emotion-focused and avoidance orientated coping (Parker & Endler, 1992). They noted that strategies focusing on the problem were often linked to engaging in tasks such as conceptualising and coming up with solutions to the

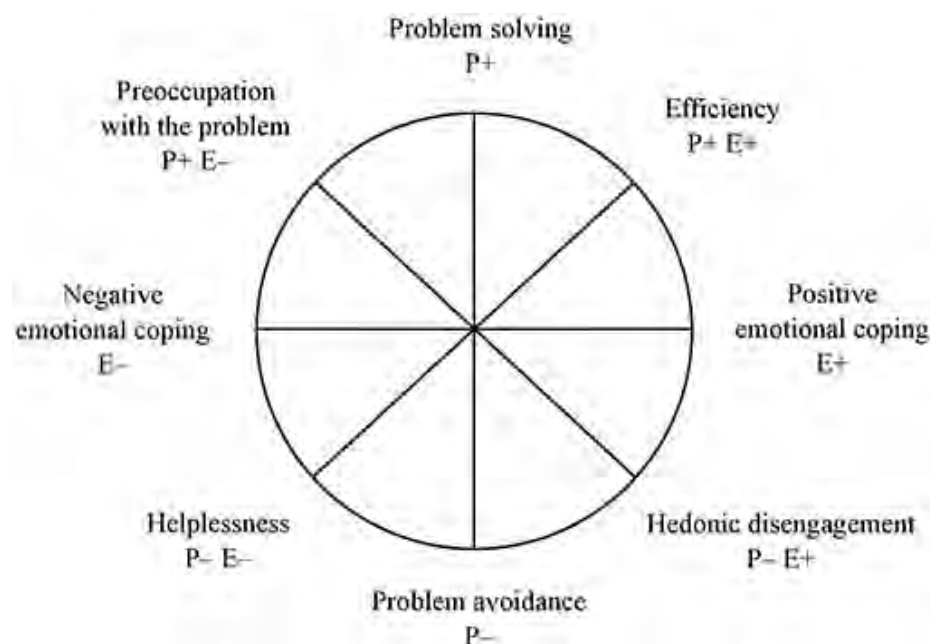
problem (tasks aimed at solving the problem, reconceptualising it and minimising its effects), while those focusing emotion focused coping linked to person orientation such as dealing with how one reacts to the situations and how to handle their emotions (emotional responses and self-preoccupation) (Parker & Endler, 1992). Avoidance-orientated coping involves both task-orientated and person-orientated strategies. Task-orientated avoidance is identified as distracting oneself from the stressor while person orientated avoidance is shifting one's attention to other people (Parker & Endler, 1992; Stanisławski, 2019).

Schwarzer and Schwarzer (1996) indicated that coping involved numerous ways of handling both personal and environmental adversity, which these earlier frameworks for classifying coping strategies did not account for. Therefore, a comprehensive model was required to integrate the coping structure during stressful situations (Stanisławski, 2019). The Coping Circumplex Model was designed by Schwarzer and Schwarzer (1996) to explain the vast nature in which people handle adversities and the numerous ways of dealing with diverse challenges, based on the two opposite-ended means focused on the problem and emotions, together with circumplex continuum of coping styles (Schwarzer & Schwarzer, 1996; Stanisławski, 2022). Guttman (1954) introduced the word "circumplex" as meaning a circular order of complexity. The model consists of four dimensions representing differences between variables, all variables have an equal distance to the centre and are evenly spaced in the circle (Acton & Revel, 2004). As it is evident, an individual can cope with stress in different ways, rendering coping a heterogenous concept (Schwarzer & Schwarzer, 1996). It is, therefore, significant to model coping strategies in the form of a relationship to different dimensions instead of identifying them as pure and mutually exclusive (Stanisławski, 2019). The Coping Circumplex Model (shown in Figure 3.1) contains bipolar dimensions, which consist of eight coping styles. During stressful situations individuals strive to either resolve

the stressor (instrumental) or manage their emotion (hedonic) which are well known as problem coping and emotion coping (Schwarzer & Schwarzer, 1996). The coping categories within the circumplex include optimistic action vs pessimistic passivity and preoccupation with the problem vs hedonic disengagement. As shown in Figure 3.1, a symbol formulated by the names of the dimensions is used to represent each coping style. P+ and P- indicate a high and low Problem coping, while E+ and E- represent high and low Emotion coping (Stanisławski, 2019). The following coping styles were identified: Problem solving (P+), Problem avoidance (P-), Positive emotional coping (E+), Negative emotional coping (E-), Optimistic action (P+ E+), Pessimistic passivity (P- E-), Preoccupation with the problem (P+ E-) and Hedonic disengagement (P- E+) (Stanisławski, 2019).

Figure 3.1

The Coping Circumplex Model



Note. From "The Coping Circumplex Model: An Integrative Model of the Structure of Coping with Stress," by K. Stanisławski, 2019, *Frontiers in Psychology*, 10(694).

<https://doi.org/10.3389/fpsyg.2019.00694>

Problem Solving vs Problem Avoidance: Problem solving can be defined as an active effort to deal with a problem. It involves cognitive and behavioural means and starts with coming to terms with the problem, understanding it, anticipating outcomes from the problem, producing solutions and therefore acting to solve the problem (Stanisławski, 2022). Problem solving requires effort from an individual and in cases where it is an interpersonal problem one might need to address the problem by discussion and reasoning (Stanisławski, 2022). This stance can be related to Lazarus and Folkman (1984) problem focused coping, as well as Endler and Parker's (1990) task-oriented coping. Problem avoidance can include postponing tasks related to the problem, giving up on the problem or just simply gaging focus on other activities other than the problem (Stanisławski, 2019).

Positive Emotional Coping vs Negative Emotional Coping: Positive emotional coping is defined as a coping mode that requires one to be understanding to oneself while solving the problem, together with using cognitive interpretations that include humour to evoke positive emotions or a calming effect (Stanisławski, 2022). Self-compassion is linked to positive emotional coping and is defined by Neff (2003) as an attitude towards oneself instead of coping because it includes elements of being non-judgmental towards oneself, showing oneself kindness and understanding that struggles are part of the journey in man's life. Negative emotional coping is more focused on the negative aspects of the adversity, negative emotions (anger) and criticising oneself (Stanisławski, 2022).

Optimistic Action vs Pessimistic Passivity: Optimistic action is a combination of problem focused coping and positive emotional coping (Wei et al., 2010). Someone with this category of coping is aware of their thoughts and feelings about the adversity and coming up with innovative ways to solve the problem (Stanisławski, 2022). Qualities of optimistic

action include acknowledging the problem and thinking of means of solving the problem with positive emotions and the expectation of positive results from solving the problem (Stanisławski, 2019). With optimistic action an individual is flexible in different situations and can easily adapt, and Carver et al. (1989) had mentioned constructs with similar qualities as optimistic action, the constructs were positive reinterpretation and growth, problem engagement (Tobin et al., 1989), active coping (Lyne & Roger, 2000) and active coping (Schwarzer, 2001). The construct growth has been seen to be linked with optimistic action and problem solving, whereas positive reinterpretation is more linked to positive emotional coping and less optimistic action (Carver et al., 1989). Pessimistic passivity is a combination of problem avoidance and negative emotional coping as it involves suppressing feelings and thoughts that are linked to the difficulty, whilst negative emotions as well as negative expectations about solving the difficulty (Stanisławski, 2022). Constructs that are of similar qualities with pessimistic passivity are ego brittleness, maladaptive coping, and internalising only the negative parts of the adversity (Wei et al., 2010). Ego brittleness is more of a personality than a trait and is linked to pessimistic passivity in that they are not very flexible or adaptable during difficulties, and they usually fall apart (Wei et al., 2010). With emotion orientated coping, stress is reduced by responding using emotions such as anger and self-blame, preoccupation over the problem and daydreaming, which significantly increases the stress levels (Endler & Parker, 1990). Furthermore, pessimistic passivity is negatively related to task-oriented coping and positively related to distraction, and distraction is similar to problem avoidance (Litwic-Kaminska & Izdebski, 2016).

Preoccupation with the Problem vs. Hedonic Disengagement: Preoccupation with the problem is seen as a combination of both problem solving and negative emotional coping as it encompasses an individual who pays attention to the problem and has a high probability

of solving it, the individual is not easily distracted and actively focuses on the issue (Calmes & Roberts, 2007). This construct is linked to perfectionism as an individual will obsess and explore all avenues in the most socially accepted manner (Stanisławski, 2022). Hedonic disengagement is linked to problem avoidance and positive emotional coping (Jonason et al., 2020). The individual avoids the difficulty by all means and pays attention to their personal well-being instead, while ignoring and disregarding the problem altogether, which leads to postponing solving the issue or giving up efforts to find solutions to the problem (Jonason et al., 2020).

3.2.3 Further Developments

Gebhardt and Brosschot (2002) noted that positive and negative correlations have been witnessed in problem-solving and avoidance strategies in the Coping Circumplex Model. It has also been noted by Arslan et al. (2009) that active problem-solving correlates positively with dealing with stress, whereas avoidance correlates negatively with stress management. Problem-focused coping is, therefore, linked to a higher likelihood of achieving goals and better academic performance and is even considered a good predictor of good job performance, while the use of avoidance strategies suggests a tendency towards inferior coping (Arslan et al., 2009). Although negative emotion-focused coping may be linked to subjective distress, it also serves positive functions in that the individual, in expressing those negative emotions, increases their chances of obtaining help and support from others (Graham et al., 2008). Stowell et al. (2001) similarly classified coping categories that encompassed both problem-focused and positive emotion-focused coping as *optimistic action*, and problem-avoidance and negative emotion-focused coping as *pessimistic passivity*. Proactive coping shares similar qualities with optimistic action, as individuals who

engage in proactive coping may view problems as themselves containing resources, and usually can solve problems even before they emerge (Schwarzer & Taubert, 2002).

A scoping review identified some underexplored coping strategies among parents of children with ASD, with recommendations made to add emotional social support as a subtype under the positive emotional dimension and social support under the problem-solving dimension (Ahmed, 2024).

3.3 Coping Among Healthcare Workers During COVID-19

Recent studies on HCW coping, firstly within a South African context by Engelbrecht et al. (2021) and Stals et al. (2024), and secondly in an international context by McFadden et al. (2021), made use of the Brief COPE Inventory (also used in this study). The Brief COPE results indicated an association between avoidant coping styles such as *self-distraction*, *denial*, *venting*, *behavioural disengagement* and mental health concerns such as post-traumatic stress disorder (Engelbrecht et al., 2021). Avoidant coping styles are patterns of dysfunctional coping strategies which individuals employ when undergoing situations which they perceive to be beyond their control, where their focus is on dealing with the problem without dealing with the emotions thereof (Engelbrecht et al., 2021). Avoidant coping methods were also found to be associated with depression and anxiety in a study on nurses' mental healthcare during COVID-19 by Stals et al. (2024).

These avoidant coping styles were similarly observed in a study by McFadden et al. (2021), which investigated the relationship between coping strategies and wellbeing, and the quality of life in HCWs in the UK during the first wave of COVID-19. They found that positive coping strategies, such as active coping and help-seeking, were associated with higher levels of well-being and higher quality of work-life, whereas negative coping

strategies, such as avoidance, correlated with lower scores on measures of well-being and quality of work-life. *Acceptance* was the most frequently used domain in the Brief COPE scale by the participants in this study, highlighting that, in the context of COVID-19 when people's lives changed drastically within a short space of time, acceptance was seen as an optimal response by HCWs (McFadden et al., 2021).

Coping strategies such as positive reframing, active coping, instrumental support and religious coping have been found to be beneficial for personal growth among HCWs in the post-COVID-19 period and were named "effective COVID-19 related coping strategies" by the researcher (Kalaitzaki et al., 2023, p. 28). They suggest that reframing the problem by looking at it from a more positive viewpoint could be helpful by eliminating the maladaptive beliefs that are often associated with stressful events, and instead allow people to assign meaning to them more intentionally (Kalaitzaki et al., 2023). Additional beneficial strategies identified by their data included taking active action towards solving the problem, which seemed to encourage feelings of control over unavoidable adversities, as well as securing and utilising social support in which emotions can be communicated and the necessary resources can be shared to better cope with the stress (Kalaitzaki et al., 2023). Furthermore, a religious or spiritual reliance on a connection with God was associated with being better able to cope with challenges, as this form of coping could have enabled participants to find helpful meaning in the challenges they faced (Kalaitzaki et al., 2023).

3.4 Conceptualisations of Self-regulation

3.4.1 Theoretical Origins

Many researchers consider Albert Bandura as the pioneer of self-regulation theory, as he, through his initial studies on the social cognitive theory and social learning theory,

unpacked individual control of behaviour through self-regulation (Sotiriadis & Galanakis, 2022), which stemmed from Kanfer's model of self-regulation (Kanfer, 1970). According to Bandura (1991), the process of self-regulation involves three steps, namely self-observation, judgment and self-response. During self-observation, the individual focuses their attention on their feelings and thoughts in order to reach their goals (Bandura, 1991). Following this, judgement refers to comparing their previous attempts set by others to reach their goal. Finally, self-response is where an individual will either praise or punish themselves for the end results (Bandura, 1991).

Following Kanfer's model (1970), Carver and Scheier (1982) proposed that three aspects form a feedback loop for self-regulation, namely: a) standards, which means the goals or behavioural ideas that one has for his/herself, then b) monitoring, which refers to comparing oneself to the standard he/she has set up for himself, and finally, c) operation, which is when the individual makes changes in order to meet the standards that he/she has set out for himself. Miller and Brown (1991) reworked Kanfer's model (1970) into a seven-step model which consists of a) receiving information from the environment, b) analysing the information and critically making meaning of the situation, c) looking at the information and comparing it to norms, d) identifying that change needs to take place, e) looking for alternatives and options on how change can be implemented, f) planning on which options to choose and how to implement, g) implementation of the plan and finally h) assessing the success of the plan (Miller & Brown, 1991).

Carey et al. (2004) postulated that for one to have self-regulation, one needs to have the ability to delay instant gratification in the short term and instead focus on the benefits in the long term. In order for this to happen, one must be able to control one's thoughts and

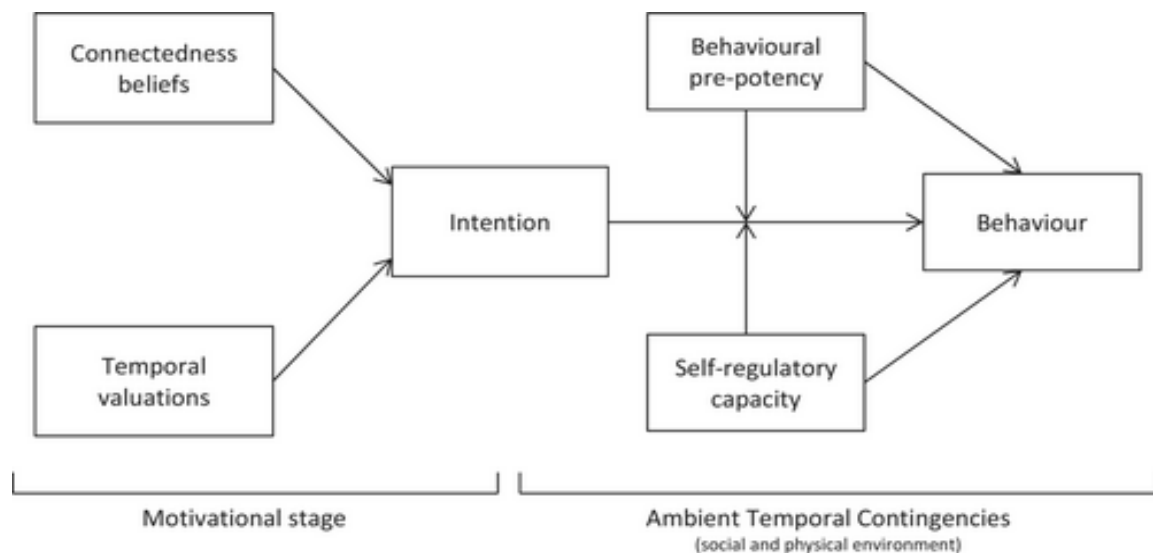
emotions and be able to concentrate on reaching the end goal (Carey et al., 2004). Naragon-Gainey et al. (2017) further proposed that self-regulation has three dimensions. First of these is emotional regulation, which refers to being able to manage, control and respond to situations that are emotionally taxing by means of mindfulness and reappraisal. Secondly, cognitive regulation refers to the ability to manage cognitive processes such as remaining positive about the future, shifting attention and mindset when necessary, and having control over one's impulses. The last dimension refers to self-related processes of honouring and affirming oneself (Naragon-Gainey et al., 2017).

Hall and Fong (2007) maintained that there is always a rationale with every human behaviour; even for those behaviours that are viewed as maladaptive, when the motive driving it is immediate favourable benefits, however with unfavourable long-term outcomes. A new theoretical framework, Temporal Self-Regulation Theory (Hall & Fong, 2007), was then presented as a means of understanding human behaviour, both generally as well as for behaviours that are self-defeating and detrimental to one's health (Hall & Fong, 2007). This framework pays close attention to behavioural contingencies and self-regulation to understand human behaviour that seems to deviate from what could be perceived as rational.

3.4.2 The Temporal Self-Regulation Theory

Loewenstein et al. (2003) indicated that hyper-responsivity to immediate contingencies is becoming a norm and has a major effect on human behaviour. According to the Temporal Self-Regulation Theory (Hall & Fong, 2007), the ability to engage in behaviour in different situations is aided by biological, cognitive, and social factors (Hall & Fong, 2013). Biological factors would be an individual's capacity to self-regulate, while social and

cognitive factors would then be beliefs about how actions in the present influence the future. These factors are important in behaviour that is focused on future implications (connectedness beliefs) and the value given to the outcomes that were temporally displayed (temporal valuations) (Hall & Fong, 2013). The reasoning behind every human behaviour results from the anticipated outcomes of the behaviour and the value of that outcome (Hall & Fong, 2007). Two factors can impact the strength of the intentions and therefore behaviour, namely behavioural pre-potency and self-regulatory capacity (Hall & Fong, 2007). Behavioural pre-potency is a value that indicates performances in the past and or cues that are in the present that need to be acted upon (Hall & Fong, 2007). On the other hand, self-regulatory capacity is the state that influences an individual's capacity to regulate their emotions (Hall & Fong 2007). As such, the actual behaviour of an individual (performance or non-performance) in a particular environment is influenced by the opposing forces of behavioural pre-potency and self-regulatory capacity based on the temporal contingencies (Immediate or non-immediate) (Hall & Fong, 2007). An example is when past performances were frequented and even the present cues elicit such frequency to continue, chances that behaviour will take place without intention are high (Hall & Fong, 2007). Similarly, an individual with low self-regulation is likely to engage in behaviour that is not deliberate depending on the immediate contingencies (Hall & Fong, 2007). In cases where the costs weigh more than the benefits, moderating factors have more of an influence as the difference between the costs and benefits become more (Hall & Fong, 2007). Below is Figure 3.2 showing the temporal self-regulation theory.

Figure 3.2*Temporal Self-Regulation Theory Model*

Note. From “Temporal self-regulation theory: A model for individual health behaviour.” by P. A. Hall & G. T. Fong, [2019], *Health Psychology Review*, 1(1), 6–52.

<https://doi.org/10.1080/17437190701492437>

A response that is prepotent is observed as a response that one might have or a reflex (Barkley, 1997). The manner of response relies on the internal biological drives, environmental cues or triggers and past behaviours. The ability to control prepotent behaviour is important for the prevention of behaviour that would be detrimental (Chen et al., 2009). Past behaviour is a strong influence on future behaviour, sometimes even stronger than intention and other structures, therefore making prepotent responses challenging for individuals who wish to change their behaviour to be more positive (Barkley, 1997). Findings from Dorina et al. (2022) supported utilising temporal self-regulation theory for a thorough understanding of behaviour and how to close the intention behaviour gap. Correlational relationships with behaviour revealed that pre-potency showed the strongest relationship with behaviour, followed by intention, and lastly, the ability to self-regulate

(Dorina et al., 2022). Liddel et al. (2021) showed that past behaviour was significant and that habits based on these behaviours moderated the intention-adherence relationship, meaning that old behaviour and habits influence the successful execution of intended behaviour. Furthermore, in order to instil motivation, self-regulation can be enhanced by analysing the situation and figuring out plans that can reduce the chances of old habits and overcome temptations (Chew et al., 2019).

Self-regulation has been found to have an effect on the psychological well-being of physicians (Simon & Durand-Bush, 2015). The ability to be able to intend and successfully execute the behaviour according to plan can be completed by practicing self-regulation, making old habits and prepotent behaviour less likely to overtake the purpose. Barley and Lawson (2016) concluded that physicians could understand and better support their patients if they understood that behavioural change can be influenced by factors such as past behaviour, intention, contextual background and beliefs.

3.5 Self-Regulation in South African Research

Docherty (2019) looked at the relationship between self-regulation, risky sexual behaviour and dating applications of young heterosexuals in the South African context. The short self-regulation questionnaire (SSRQ) (Carey et al., 2004), which consists of 31 items, was used in the study to measure general self-regulation. The study concluded that there was no practical significance of self-regulation on risky sexual behaviour, contrary to the notion that deficits in self-regulation were associated with risky sexual behaviour (Docherty, 2019). Another study by Cloete et al. (2012) looked at the relationship between psychopathology, self-regulation and gender. Results indicated that while there was no difference in gender in terms of self-regulation and psychopathology, men who were less at

risk for alcohol-related problems and women who were less at risk for eating-related disorders showed better levels of decision-making, mindfulness and perseverance. Tlotleng et al. (2021) focused on the prevalence of common mental disorders and associated factors among golf course workers in Johannesburg, South Africa. Participants with depression, anxiety and psychosomatic complaints were identified, and their self-regulation was reported through the SRQ-20. Participants who reported better self-regulation were less likely to have alcohol use disorders and, therefore, a decreased overall chance for common mental disorders. This shows how individuals' ability to self-regulate may protect against the development of psychopathology.

3.6 Conclusion

Coping involves ways of dealing with and overcoming stressful situations, while self-regulation is being able to regulate one's emotions and deal with a problem. This chapter highlighted theories such as the Coping Circumplex Model and the Temporal Self-Regulation Theory. Previous research has shown just how dysfunctional coping can affect the well-being of HCWs, as well as how poor self-regulation may lead to challenges with mental health. The following chapter will provide an overview of the methodology of this study before the results of this research are presented in Chapter 5.

CHAPTER FOUR

RESEARCH METHODOLOGY

4.1 Introduction

This chapter provides an overview of the research goals and objectives, followed by a detailed discussion of the research design utilised. Furthermore, the sampling procedures will be discussed together with the data collection procedures, including information regarding the measurement instruments used to gather the data. Lastly, an overview of the study's ethical considerations and statistical procedures will be provided.

4.2 Aim and Objectives of the Study

The main aim of this study was to explore the relationship between mental health concerns on the one hand and coping and self-regulation on the other, by exploring which variables, or combination of variables, best predict the mental health concerns of nurses. In addition to this, this study aimed to determine the extent to which self-regulation and coping contribute to the variance in the reported experience of mental health concerns among primary healthcare nursing staff. To investigate this, the components of self-regulation as operationalised through the SSRQ (namely assessing, evaluating, implementing, planning, receiving, searching, and triggering), as well as the components of coping as operationalised through the three coping categories on the COPE instrument (namely emotion-focused coping, problem-focused coping, and dysfunctional coping), will be similarly analysed to investigate their unique contributions to the participant's reported mental health concerns. Lastly, the final objective is to investigate the role, if any, played by demographic variables,

such as age, gender and work experience in the current occupation. In investigating these variables, the following research questions are posed:

- To what extent can self-regulation and coping contribute to the variance in the reported experience of mental health concerns among primary healthcare nursing staff?
- What are the unique contributions of self-regulation and coping components to the participant's reported mental health concerns?
- What role if any do biographical variables such as gender, age and work experience play in current occupation?

4.3 Research Approach and Study Design

Obtaining data in the form of numbers and analysing it by making use of statistics is seen as quantitative research, a type of research that examines the social world objectively to test ideas and hypotheses empirically and scientifically (Punch, 2005; Tewksbury, 2009). Terre Blanche et al. (2016) defined a quantitative paradigm as based on positivism, which focuses on nomothetic scientific explanation. Table 4.1 summarises the key characteristics of the quantitative approach in social research (De Vos et al., 2011; Garbarino & Holland, 2009; Neuman, 2011; Terre Blanche et al., 2016; Tewksbury, 2009).

Table 4.1:*Key pointers of the quantitative approach in social research*

Characteristic	Description of quantitative approach
<i>Epistemology</i>	Positivism
<i>Purpose</i>	Cause-and-effect hypotheses regarding social reality
<i>Methods</i>	Deductive
<i>Key factor</i>	Reliability
<i>Analysis</i>	Statistical
<i>Suitability</i>	Seek to control phenomena
<i>Language</i>	Concepts are converted into operational definitions; results are numerical and presented in statistical language
<i>Design</i>	Standardised with fixed procedures
<i>Research methods</i>	Systematically, standardised
<i>Unit of analysis</i>	Atomistic (elements that form part of the whole)
<i>Researcher</i>	Detached from the research, and objective.

Note. Adapted from “Research at grassroots: For the social sciences and human service professions,” by C. S. L. Delport, C. B. Fouché, A. S. De Vos and H. C. Strydom, 2011, Van Schaik Publishers

De Vos et al. (2011) refer to two types of quantitative research designs, namely experimental designs, and non-experimental designs. Non-experimental research is usually descriptive or correlation, allowing the researcher to either describe a situation or phenomenon simply as it stands, or to describe a relationship between two or more variables without any interference from the researcher (De Vos et al., 2011). Consequently, variables are not manipulated (e.g., by changing the conditions that an experimental group undergoes), and participants are not randomly assigned to a control or treatment group

(Fouché & De Vos, 2005). A quantitative, non-experimental, cross-sectional, survey-type research design (Fischer et al., 2023; Stanger, 2015) was used in this study.

4.4 Participants and Sampling Procedures

A non-probability, convenience sampling technique (Wilson & MacLean, 2011) was used to approach the recruitment and selection of participants in this study. As discussed in Chapter 1, the vulnerability of frontline nursing staff within the primary healthcare level informed the selection of the sampling technique and criteria. The following inclusion criteria applied: a) employed as a nursing staff member by the Free State Department of Health at a Primary Healthcare Clinic in the Lejweleputswa district at the time of data collection, and b) having worked at the facility during the COVID-19 pandemic.

A specific district in the Free State was identified which would be convenient for the researcher to visit during the data collection phase. Additionally, previous collaborations between the researcher and the clinic managers during community-based healthcare projects in the area were considered to enhance the feasibility of the study. Therefore, the primary healthcare clinics in the Lejweleputswa District were selected as study sites from which to sample participants. The calculation of the sample size was influenced by population size, namely 230 nursing staff employed throughout the 39 primary healthcare clinics in the District (N. Lefu, personal communication, 11.09.2021).

Applying a confidence interval of 95%, it was calculated that a minimum of 146 participants should, therefore, be recruited for the study. Participant recruitment entailed the distribution of information documents (Appendix C) at all clinics in the Lejweleputswa district. Potential participants were given a week to go through all the material, read the information sheet and decide on their participation, as well as contact the researcher

regarding questions they may have about the research. To increase an initial slow response rate, the researcher held meetings with the clinic managers to present the research participation opportunities to the nurses working there, as well as met with nursing staff during handover meetings to explain the nature of the study.

4.5 Data Collection

Flyers were handed out and placed in the reception areas and staff tearooms of the identified clinics throughout the District, inviting nursing staff members to collect information on the research from the clinic manager's office. All COVID-19 protocols, which were in place at the primary healthcare sites at the time (masking, sanitising, distancing, etc.), were upheld during the distribution of forms. Those who expressed an interest in participating in the study received an envelope which contained a) an information page explaining the nature of the study, b) an informed consent form, as well as c) the questionnaires used as measuring instruments in this study.

Interested participants then had two weeks to complete the questionnaires at times most convenient to them, to minimise the impact of their participation on their work. During the third week, a submission box was placed where the participants could submit their completed questionnaires anonymously by sealing the provided envelopes containing their completed documents. The researcher then collected these boxes from all 10 facilities for data analysis. The data collection period started in August 2022 and ended in October 2022.

4.6 Measuring Instruments

4.6.1 *Self-Compiled Demographic Questionnaire*

To gather the demographic data necessary for the investigation of the research questions, the researcher compiled a demographic questionnaire, designed to collect data on the age, gender and work experience of participants (see Appendix D).

4.6.2 *Shortened Self-Regulation Questionnaire*

The Shortened Self-Regulation Questionnaire (SSRQ) (Aubrey et al., 1994; Carey et al., 2004) was used to measure the participants' self-regulation. The self-report questionnaire consists of 31 items and 7 subscales of different self-regulation strategies, namely assessing, evaluating, implementing, planning, receiving, searching, and triggering. Respondents select their responses by circling one of the five scale options ranging from "strongly disagree" to "strongly agree", with an "uncertain or unsure" middle option. Scoring is done by summing the numerical values allocated to the response options provided. In a South African investigation into its utility and psychometric properties, the SSRQ demonstrated satisfactory reliability (Cronbach alpha of .895) and yielded a high degree of criterion-related validity through strong correlations for the total scale as well as the 7 subscales with various measures of psychological well-being, ranging from .560 to .697 (Potgieter & Botha, 2009).

4.6.3 *Coping Orientations to Problems Experienced Questionnaire*

The Coping Orientations to Problems Experienced Questionnaire (COPE) measures the participants' coping strategies through 14 subscales (Carver et al., 1989; Su et al., 2015). The items of this measure are structured using a Likert scale, with potential responses

ranging from 1, labelled “I usually do not do this at all” to 4, which is labelled “I usually do this quite a lot”. The subscales are grouped together into three broad categories, namely Problem-focused Strategies, Emotion-focused Strategies, and Dysfunctional Strategies (Du Plessis, 2012). Research on measuring the item-total correlation coefficient and Cronbach’s alpha of the COPE inventory resulted in satisfactory psychometric properties with internal consistency and Cronbach alphas between 0.89 and 0.86 (Du Plessis, 2012).

4.6.4 *Shortened Depression, Anxiety and Stress Scale*

For the measurement of mental health concerns, the shortened Depression, Anxiety and Stress Scale was used. The DASS-21 is a 21-item version of the Depression Anxiety Stress Scale developed to measure symptoms of depression, anxiety, and stress in clinical settings (Coker et al., 2018). It consists of 21 questions, with each scored on a four-point Likert scale from 0 (“did not apply to me”) to 3 (“applied to me very much”). Depression, anxiety and stress are measured by seven questions each, with higher scores meaning more severe symptoms. Depression, anxiety and stress symptoms were graded through the application of cut-off scores from within normal limits to mild, moderate, severe or extremely severe during the calculation of participants’ Likert scores, as mentioned above. In an African study of medical students, the reliability of the DASS-21 yielded satisfactory Cronbach alpha coefficients for depression (0.81), anxiety (0.89) and stress (0.78), respectively (Coker et al., 2018).

4.7 Reliability of Measuring Instruments: Preliminary Statistical Analysis

All data collected from participants were manually entered into Microsoft Excel (Microsoft Corporation, 2018) by the researcher and was analysed using the Statistical

Package for the Social Sciences (SPSS) version 29 (IBM Corporation, 2022). Once the descriptive statistics were completed regarding the demographic variables of the participants, the internal reliability of all the measuring instruments was determined by calculating Cronbach's alpha coefficients for all the subscales of the three measuring instruments (presented in Table 5.1 in the following chapter). Reliability coefficients of .7 or higher are deemed acceptable in studies within the social sciences context (Lance et al., 2006). Except for the SSRQ self-evaluation subscale, the coefficients of the SSRQ subscales range between .538 and .665 and the researcher decided to retain them for further statistical data analysis. Further analysis of the measuring instruments is presented in Section 5.3.

4.8 Data Analysis Procedures

Pearson's product-moment correlations were, firstly, performed to investigate the relationship between the mental health concerns included in this study (as measured by the depression, anxiety and stress subscales of the DASS-21), self-regulation, and coping strategies in primary healthcare nurses. Data analysis further investigated any significant differences between groups regarding demographic variables that were indicated as potential risk factors by the literature reviewed in Chapter 2 (namely gender, age, and years of experience).

In line with the research question of this study, the criterion of mental health concerns (depression, anxiety, and stress) was measured using three distinct subscales within the DASS-21. Analyses were conducted separately for each of these subscales. To determine the extent to which the variance in mental health concerns of primary healthcare nurses can be explained by the mentioned predictors, hierarchical regression analyses

(Howell, 2013) were performed. The squared multiple correlation coefficient (R^2) obtained through the regression analysis indicates the proportion of variance in mental health concerns explained by a specific variable, such as coping subscale scores or self-regulation subscale scores, a combination of these variables, or the full model. The procedures followed were as follows:

1) *Assessing the total explained variance:*

The total variance in the criterion variable (namely mental health) which was explained by the predictor variables collectively (including both self-regulation and coping in a full model), was determined.

2) *Determining the unique contribution of individual predictors:*

Subsequently, one of the predictor variables was omitted at a time from the model to ascertain that specific variable's unique contribution to explaining the variance in mental health concerns.

3) *Evaluating the combined contribution of predictor sets:*

Finally, all variables from a particular set of predictors were omitted at a time to determine the combined contribution they made to the variance in mental health concerns.

To establish whether the contribution of a specific variable or set of variables to the R^2 value is statistically significant, it was examined using the hierarchical F-test. The way this test can be calculated (Van der Walt, 1980) is provided below:

$$F = \frac{(R^2_{y.1...k1} - R^2_{y.1...k2}) / (k_1 - k_2)}{(1 - R^2_{y.1...k1}) / (N - k_1 - 1)}$$

where:

$R^2_{y.1\dots k_1}$ = the squared multivariate correlation coefficients for the higher number of independent variables

$R^2_{y.1\dots k_2}$ = the squared multivariate correlation coefficients for the smaller number of independent variables

k_1 = Higher number of independent variables

k_2 = Smaller number of independent variables

N = Total number of participants

When examining the significance of an increase in R^2 , it is also necessary to calculate the effect size of the contribution made by a specific predictor(s). The effect size provides an indication of the contribution to R^2 in terms of the proportion of unexplained variance in the full model. According to Van der Westhuizen et al. (1989), the effect size of individual contributions can be calculated in terms of f^2 , and following Cohen's guidelines (Steyn, 1999), the following threshold values can be used to interpret the effect size: $f^2 = 0.01$: small effect; $f^2 = 0.15$: medium effect; and $f^2 = 0.35$: large effect. Only results with medium to large effect sizes will be further discussed. All analyses were conducted using the SPSS software program, version 29 (2022). In the following analyses, the 1% level of significance has been utilised.

4.9 Ethical Considerations

The study was conducted in accordance with the Code of Conduct of the South African Professional Board of Psychology. Ethical approval for the study was obtained from the Health Sciences Research Ethics Committee of the University of the Free State. In granting ethical approval for the study to be conducted, the ethics number: UFS-HSD2022/0155/2607 (Appendix A) was assigned to the study. Permission to conduct the

study in primary healthcare facilities within the public sector was obtained from the Free State Department of Health (see Appendix B). Before commencing with the data gathering, the researcher signed confidentiality agreements provided by the participating Health Department, stating that the researcher would always maintain the confidentiality of the participants.

All potential participants were given a complete information leaflet when offered the opportunity to participate in the study to ensure that they could make an informed decision regarding participation (Appendix D). This leaflet detailed the purpose of the research, the potential risks, and inconveniences, as well as the potential benefits involved in participation in the study. Additionally, the information leaflet outlined on how feedback on the study outcome and findings would be made available to the participants. All participants were required to provide written informed consent before they completed the questionnaires. Participation in the study was always entirely voluntary. Participants were informed that they could withdraw at any time prior to the publication of the findings, without penalty and without an explanation for their withdrawal.

Specific risk mitigation strategies, over and above ensuring participant anonymity in reporting the results, were used in this study. Firstly, no deception strategies were used by the researcher, who transparently ensured that participants understood what participation would realistically entail by making the measurements available to them during the informed consent process. Further mitigation strategies were developed to address the minimal likelihood of psychological risk to participants. In the event of any emotional distress experienced by participants, the option of referral to the existing occupational health and employee wellness services within the Free State Department of Health was

provided. To accommodate possible self-referrals for emotional support, participants were also provided with the contact details for additional available services as part of the study information, including the SADAG 24-hour helpline (0800 567 567 or 080 045 6789), as well as the researcher's contact details if they require assistance with the appropriate referral for further management of any emotional distress. No adverse experiences or any requests for further referral or assistance were raised to the researcher by any of the participants during or after the data collection process. Participants were also allowed to complete the questionnaires at a time or place that allowed them to do so privately and mitigate any interruption participation could potentially cause to their work schedules. All collected data collected from participants remained confidential and complete anonymity was adhered to throughout the research process. In keeping with this process, participants could not be linked to the answers they provided during participation. Furthermore, all hardcopy data was securely stored, and digital records were stored on a password-protected computer handled exclusively by the researcher. In line with the maintenance of confidentiality in handling all data, participation records could not be linked to individual participants' responses.

4.10 Conclusion

This chapter presented a review of the research aim and objectives, including the research questions and research design. Furthermore, the sampling and data-gathering procedures utilised in the current study were elaborated on before a detailed description of the measuring instruments utilised was discussed, alongside information regarding the construction of the questionnaire. Additionally, the statistical procedures followed during the investigation were introduced and explained. Finally, an overview of all the ethical

considerations relating to participant well-being and professional standards followed in the execution of this study was provided.

CHAPTER FIVE

RESULTS

5.1 Introduction

The current chapter presents the results from the statistical analyses detailed in the previous chapter. Firstly, the profile of the participants is presented, followed by the reliability of the three measuring instruments used in this study. Thereafter, the results from the correlational analyses of the relationship between mental health concerns, self-regulation, and coping strategies will be reported. This will be followed by the reports on the hierarchical multiple regression analyses performed during part one and part two of the analysis. Statistically significant results with moderate to large effect sizes will be highlighted in this chapter for further discussion in Chapter 6. For dependent *t*-tests, Cohen's *d* of .2 indicates a small effect size, .5 indicates a moderate effect size, and .8 indicates a large effect size (Cohen, 1988). For this study, the 1% and the 5% statistical significance levels were utilised.

5.2 Sample Characteristics

A total of *N*=146 primary healthcare nurses were recruited from within the Lejweleputswa clinics in the Free State. Frequencies relating to age, gender, work experience, health history (including COVID-19-testing and isolation because of exposure to COVID-19), as well as the loss of a family member/colleague due to COVID-19 were calculated (see Table 5.1).

Table 5.1*Frequency Distributions of Demographic Variables*

Demographic variables	Frequency	%
Age in years:		
18-30	27	18.5
31-40	70	47.9
41-50	46	31.5
>50	3	2.1
Gender:		
Male	48	32.9
Female	90	61.6
Non-binary	8	5.5
Work experience in years:		
1-5	65	44.5
6-10	62	42.5
>10	19	13.0
Health History:		
Have you ever tested positive for COVID-19?		
Yes	92	63.0
No	54	37.0
Have you ever had to isolate because of exposure?		
Yes	109	74.7
No	37	25.3
Have you ever tested for COVID-19 before?		
Yes	126	86.3
No	20	13.7
Have you ever lost family member/colleague to COVID-19?		
Yes	116	79.5
No	30	20.5

The frequencies presented in Table 5.1 show that almost half of this sample (47.9%) was aged between 31 and 40 years. One-third of the participants were older than 40 and 18.5% percent were thirty years old or younger. More than half of the sample in this study were female (61.6%), while the remaining were male (32.9%) and non-binary (5.5%). Almost half of the participants had less than 5 years of work experience, while the other half reported between 6 and 10 years. The remaining small portion (13%) had worked more than 10 years in the field.

Regarding the sample's COVID-19 exposure history as assessed through the questions included in Table 5.1, two-thirds of the participating nurses (63%) reported testing positive for COVID-19 themselves at some point during the pandemic. Almost three-quarters of the participants (74.7%) reported at least one COVID-19-related isolation period, and 86.3% of the participants reported previous COVID-19 testing. Most participants (79.5%) indicated that they had lost a relative or colleague due to COVID-19.

5.3 Psychometric Performance of the Measuring Instruments

5.3.1 Reliability Coefficients

The reliability coefficients of the respective measuring instruments were calculated using Cronbach's α coefficient. The results of this analysis are displayed in Table 5.2. Reliability coefficients of .7 or higher are deemed acceptable in studies within the social sciences context (Lance et al., 2006). Except for the SSRQ subscale of *self-evaluation*, the coefficients of the SSRQ subscales ranged from .538 and .665. The DASS-21 and the COPE subscales demonstrated satisfactory reliability coefficients. Subsequently, the researcher decided to omit the *self-evaluation* subscale score and retain the remaining SSRQ subscales, COPE subscales and DASS-21 subscales for the analyses that follow.

5.3.2 Means, Standard Deviations, Skewness and Kurtosis

The means, standard deviations, skewness and kurtosis for all subscales were calculated, as presented in Table 5.3. Cronbach's alpha coefficients (α) were calculated to determine internal reliability.

Table 5.2*Reliability of Measuring Instruments (NWU – SSRQ)*

Measurement scale	Coefficient
DASS-21	
Depression	.868
Anxiety	.809
Stress	.847
SSRQ	
Monitoring	.563
Decision Making	.657
Learn from mistakes	.623
Persistence	.665
Self-evaluation*	.360
Creativity	.538
Mindful Awareness	.664
COPE	
Problem-focused	.799
Emotion-focused	.741
Dysfunctional	.786

*Note: Scale has only one item.

Table 5. 3*Means, Standard Deviations, Skewness and Kurtoses for the DASS-21, SSRQ (NWU_SSRQ)**and COPE Scales*

Measurement scale	Mean	Sd*	Skewness	Kurtosis
DASS-21				
Depression	14.45	10.04	.289	-1.107
Anxiety	15.0	9.18	.295	-.422
Stress	16.70	10.36	.154	-.730
SSRQ				
Monitoring	14.05	2.45	-.812	.894
Decision making	15.36	3.28	.255	-.968
Learn from mistakes	13.17	3.00	-.006	-.661
Persistence	16.49	3.57	-.081	.031
Creativity	10.30	2.04	-.620	-.276
Mindful Awareness	13.10	2.99	.211	-.781
COPE				
Problem-focused	53.53	8.74	.390	.444
Emotion-focused	45.26	7.25	-.132	.095
Dysfunctional	24.64	6.78	.350	-.616

As presented in Table 5.3, the mean score for the DASS-21 *depression* subscale is 14.45, suggesting that participants, on average, reported moderate levels of depression from the measure. The mean score for the DASS-21 *anxiety* subscale was 15, which suggested that participants, on average, reported severe anxiety symptoms on this measure. Finally, for the DASS-21 *stress* subscale, the mean score of 16.7 indicated mild stress levels reported on average.

As discussed in Chapter 4, only the SSRQ subscales with adequate reliability coefficients were included in further analysis. Table 5.3 displays the mean scores for the retained subscales of the SSRQ, namely *monitoring* (14.05), *decision-making* (15.36), *learning from mistakes* (13.17), *persistence* (16.49), *creativity* (10.30) and *mindful awareness* (13.10).

Lastly, Table 5.3 shows the results from the three COPE higher-order factors. The means scores obtained suggest that the participants reported favouring *problem-focused coping* strategies (53.53) over the use of *emotion-focused* (45.26) and *dysfunctional coping* strategies (24.64).

According to Peat et al. (2008) a range between -1 and +1 indicated slight skewness, while values between -2 and +2 indicated moderate skewness. For kurtosis, a normal distribution is between -3 and +3 (Brown, 1997). From Table 5.3, it can be seen that the skewness values, as well as the kurtosis values, for all the relevant variables, fall within the normal limits and can, therefore, be used to investigate the formulated research objectives.

5.4 The Relationship Between Mental Health Concerns, Coping, Self-regulation and Demographic Variables

One of the objectives of this study is to investigate if any statistically significant differences between groups could be observed in the mean scores of mental health concerns (obtained from the DASS-21 subscales of *depression*, *anxiety* and *stress*); coping strategies (obtained from the COPE subscale categories of *problem-focused*, *emotion-focused* and *dysfunctional coping*) and self-regulation (obtained from the six included SSRQ subscales of *monitoring*, *decision-making*, *learning from mistakes*, *persistence*, *creativity* and *mindful awareness*). The demographic variables for the respective age and gender groups as well as working experience (in years) and whether they tested positive for COVID-19 were also investigated. In Table 5.4 the frequency distributions of these variables are presented.

Table 5.4

Frequency Distribution of Age, Gender, Work Experience and Positive Testing for COVID-19

Variable	Group	Frequency	Percentage
Age	18-30	27	18.5
	31-40	70	47.9
	41 and older	49	33.6
Gender	Male	48	34.8
	Female	90	65.2
Work experience	1-5 years	65	44.5
	6 and more	81	55.5
Positive COVID_19	Yes	92	63.0
	No	54	37.0

The data presented in Table 5.4 show the demographic variables that were considered for further analysis. As multiple independent and dependent variables were involved, and according to Howell (2013), the appropriate statistical procedure is a

MANOVA analysis. In order for a MANOVA analysis to be applicable, statistical inferences will be based on key assumptions which should be satisfied (Du Toit & Stumpf, 1982). These are:

1. The data set is compiled through sampling from a multivariate normal population.
2. Equal subgroup covariance matrices should be present.
3. The subgroups are a collection of various independent data sets.

If the data set satisfied all three assumptions and a significant result (F -value) was found, then one-way ANOVAs would be conducted with each dependent variable. Seeing that age (three groups) comprised more than two subgroups, the Scheffé procedure was used to determine in which of these subgroups (if any) the mean scores of the dependent variable differed significantly statistically.

Effect sizes (Steyn, 1999) of the statistical results were calculated to measure practical importance. The practical importance of the results was examined to determine whether any of the statistically significant results possibly found in the analyses were meaningful. The following guiding effect size values (f) can be used when comparing population means (as in Research Hypothesis 2) namely .1 = small effect, .25 = medium effect, and .4 = large effect. Both the 1% and 5% levels of significance were utilised.

As discussed previously, it was necessary to determine whether the data set fulfilled the three stated assumptions (Du Toit & Stumpf, 1982). Regarding the first assumption, the data in Table 5.4 indicated that no significant deviations of normality could be identified. Regarding the second assumption, the Box's Test of equality of covariance matrices were performed. The result yielded a Box statistic of 153.237, with a non-significant F -value of 1.266 ($p = .059$). Thus, it can be concluded that the dependent measure covariance matrices

did not differ significantly across groups. Additionally, there were equal subgroup covariance matrices observed for the main effects. Lastly, it seems from the research design that the subgroups were independent, thereby also meeting the requirements of the third assumption. With all three assumptions having been met, hypothesis testing proceeded by conducting a MANOVA with the four independent variables. The results thereof are presented in Table 5.5.

Table 5.5

MANOVA Results with Age, Gender, Work Experience and Positive testing for COVID-19 as Main Effects and Mental Health Concerns, Coping and Self-regulation as Dependent Variables

Effect	df	<i>F</i>	<i>p</i>	<i>f</i> ²
Age	12; 109	.962	.518	.097
Gender	12; 109	1.998	.031	.180
Work experience	12; 109	1.255	.256	.121
Positive COVID	12; 109	.798	.652	.081

The results from Table 5.5 indicate that a significant main effect was identified for *gender* at the 5% level ($p = .031$). As there were twelve dependent variables, one-way ANOVA's were conducted to determine for which of these dependent variables significant differences between the means for the two gender groups existed. Table 5.6 shows the results for the two gender groups. None of the other demographic variables, such as age, work experience, or previous coronavirus infection, showed any significant differences between groups.

Table 5.6*ANOVA Results with Gender as Main Effect*

Dependent variable	Male		Female		u	Mean square	F	p	f
	$\bar{X}$	sd	$\bar{X}$	sd					
Depression	17.08	10.53	12.29	9.14	1	488.33	5.441	.021*	.21
Anxiety	15.83	8.91	13.78	9.01	1	149.71	1.984	.162	.13
Stress	18.58	9.97	14.82	10.21	1	343.11	3.476	.065	.17
Problem-focused	53.15	8.74	54.04	8.72	1	90.17	1.295	.257	.10
Emotion-focused	45.15	7.32	45.20	7.42	1	48.94	.893	.347	.08
Dysfunctional	23.42	6.70	25.34	6.75	1	38.84	.832	.364	.08
Monitoring	13.94	1.91	14.17	2.64	1	.38	.060	.808	.00
Decision making	15.94	3.39	15.03	3.28	1	4.12	.376	.541	.05
Learn from mistakes	13.06	3.06	13.29	3.00	1	.33	.035	.851	.00
Persistence	16.33	3.87	16.68	3.44	1	2.13	.166	.685	.01
Creativity	9.75	2.16	10.72	1.78	1	33.36	9.800	.002**	.28
Mindful Awareness	12.94	3.06	13.33	2.92	1	6.48	.754	.387	.08

Note. sd = Standard Deviation

* $p \leq .05$. ** $p \leq .01$

It is clear from Table 5.6 that statistically significant differences in the means of the two gender groups were found for two dependent variables, namely *depression* (on the 5% level; $p = .021$) and *creativity* (on the 1% level; $p = .002$). Medium effect sizes were found for both results. From Table 5.6, it is clear that the male healthcare nurses obtained a significantly higher mean score on depression than the female nurses. The female healthcare nurses obtained a significantly higher mean score on creativity than their male counterparts.

5.5 The Relationship between Mental Health Concerns, Self-regulation and Coping

Pearson's product-moment correlation coefficients were utilised to analyse the relationship between mental health concerns, self-regulation and coping strategies in

primary healthcare nurses. The correlation coefficients are presented in Table 5.7 for the total group.

Table 5.7

Correlation coefficients between the criteria and predictor variables for the total group

(N=146)

Variables	1	2	3	4	5	6	7	8	9	10	11	12
1 Depression	-	.78	.84	-.20	-.27	-.23	-.37	-.28	-.33	-.19	-.06	.16
2 Anxiety		-	.81	-.20	-.32	-.27	-.33	-.26	-.32	-.05	-.03	.21
3 Stress			-	-.22	-.32	-.24	-.37	-.25	-.30	-.07	.04	.25
4 Monitoring				-	.28	.44	.32	.48	.35	.19	.05	-.13
5 Decision making					-	.59	.66	.16	.69	.12	.08	-.24
6 Learn from mistakes						-	.61	.54	.69	.22	.13	-.07
7 Persistence							-	.47	.65	.21	.07	-.22
8. Creativity								-	.44	.17	.14	-.03
9. Mindfulness									-	.18	.11	-.20
10 Problem-focused										-	.72	.17
11 Emotion focused											-	.14
12 Dysfunctional												-

* $p \leq 0.01$

Note: Coefficients between the predictors and criteria with medium and large effect sizes are in bold.

According to Cohen (1992) correlation coefficients of .10 and above hold a small effect size, .30 and above a medium effect size, and .50 and above a large effect size. In accordance with this, the medium and large effect sizes of the correlations between the different subscales of the measures that were included in the analyses will be highlighted next.

The DASS-21 scores obtained by the participants on the *depression* and *anxiety* subscales have relatively strong positive correlations (0.78 and 0.84), suggesting that participants who reported higher levels of depression also tended to report higher levels of anxiety on this measure. DASS-21 scores on the *anxiety* subscale showed relatively strong

positive correlations to those on the *stress* subscale (0.81), which suggests that participants who have reported higher levels of anxiety also reported higher levels of stress on the measure. The SSRQ subscale scores for *decision-making*, *learning from mistakes*, *persistence* and *mindfulness* also show strong positive correlations in this study (0.59, 0.66, and 0.69 respectively). This suggests that participants who reported more frequent use of decision-making as a self-regulation strategy were also more likely to report using strategies such as learning from their mistakes, being persistent and being mindful. Furthermore, scores in *learning from mistakes* and *persistence*, *creativity* and *mindfulness* indicated strong positive correlations (0.61, 0.54, and 0.69 respectively), which means that participants who reported higher levels of learning from their mistakes also reported higher levels of persistence, creativity and mindfulness. Finally, scores in *persistence* and *mindfulness* showed a strong positive correlation (0.65) which suggests that participants who had higher levels of persistence tended to report higher levels of mindfulness on the measure. SSRQ scores in *monitoring* and *learning from mistakes* (0.44), *persistence* (0.32), *creativity* (0.48) and *mindfulness* (0.38) showed medium positive correlations, suggesting a medium correlation between the use of these self-regulation strategies. The COPE scores of participants on the subscale categories of *problem-focused coping* and *emotion-focused coping* showed a strong positive correlation (0.72). This means that participants who reported higher degrees of utilisation of problem-focused coping tended to also report using emotion-focused coping strategies more often.

From Table 5.7, it can be seen that a negative relationship of moderate strength (-0.37) was observed between *depression* (as reported on the DASS-21) and *persistence* (as per the SSRQ). This means that the higher the participants' *depression* score, the lower their *persistence* score tends to become. A moderate strength (-0.33) was also observed between

depression (DASS-21 subscale) and *mindfulness* (SSRQ subscale), indicating that the more severe the depression symptoms that were reported, the lower their mindfulness tended to be. Similarly, the DASS-21 subscale score for *anxiety* and the SSRQ subscale scores for *persistence* (-0.33), *mindfulness* (-0.32) and *decision-making* (-0.32) showed a negative relationship of moderate strength. Participants who scored higher for anxiety, therefore, were less likely to endorse the use of decision-making, persistence and mindfulness as self-regulation strategies. Similarly, the relationship between scores on *stress* (DASS-21 subscale) and SSRQ subscales of *decision-making* (-0.32), *persistence* (-0.37) and *mindfulness* (-0.30) showed a negative relationship of moderate strength, indicating that participants who scored higher for stress were less likely to report decision making, persistence and mindfulness as their preferred self-regulation strategies.

Small positive correlations were observed between *dysfunctional coping* scores on the COPE and *depression* (0.16), *anxiety* (0.21) and *stress* subscale scores (0.25) on the DASS-21. Small positive correlations were also observed between *problem-focused coping* scores on the COPE and *monitoring* (0.19), *decision-making* (0.12), *creativity* (0.17), *mindfulness* (0.18) *persistence* (0.21) and *learning from mistakes* (0.22) as subscale scores on the SSRQ. *Emotion-focused coping* scores obtained on the COPE only showed a small positive correlation with scores on the *learning from mistakes* (0.13), *mindfulness* (0.11) *creativity* (0.14) subscale of the SSRQ. Table 5.7 also shows the negative relationship of low strength (-0.20) observed between *depression* and *monitoring* and *decision-making* (-0.27), *learning from mistakes* (-0.23), and *creativity* (-0.28) as SSRQ subscales. A negative relationship of low strength (-0.20) was observed between *depression* and *problem-focused coping* (-0.19) as measured by the COPE scale. Further low-strength negative relationships were observed between anxiety and *monitoring* (-0.20), *learning from mistakes* (-0.27) and

creativity (-0.26). Finally, *stress* showed a negative relationship of low strength with *monitoring* (-0.22), *learning from mistakes* (-0.24) and *creativity* (-0.25).

5.6 The Contribution of Self-Regulation and Coping to Depression

Additionally, to investigate the remaining research objective, hierarchical regression analyses were conducted. The percentage variance of the criterion explained by each predictor variable is indicated by R^2 . To determine the specific contribution that each predictor makes to the variance of a particular criterion, the R^2 value is calculated with and without the specific predictor. The significance of the difference in R^2 that occurs is calculated using the hierarchical F-test, while effect sizes (f^2) were also computed and demonstrated. As mental health is represented by three subscales, the analyses will be repeated for each subscale as dependent variables. The results of depression as the dependent variable are shown in Table 5.8. Cohen (1992) reported that, for hierarchical multiple regression analysis, an effect size of .02 is considered small, .15 would be moderate, and .35 large.

The results in Table 5.8 firstly indicate that all the predictor variables collectively explain 20.4% ($R^2 = 0.204$) of the variance in *depression* scores among primary healthcare nurses. This calculated R^2 value is significant at the 1% level [$F_{9;1360} = 3.873$; $p = .001$].

Table 5.8*Contributions of Self-regulation and Coping to R² for Depression*

Variables	R ²	Contribution to R ² : Full minus reduced model	F	f ²
1. [self-regulation] + [coping]	.204	1-5 = .030	1.708	.04
2. [self-regulation] + Problem-focused	.187	2-5 = .013	2.206	.02
3. [self-regulation] + Emotion-focused	.174	3-5 = .000	-	-
4. [self-regulation] + Dysfunctional	.178	4-5 = .004	.671	.004
5. [self-regulation]	.174			
6. [Coping]+[self-regulation]	.204	6-13 = .118	3.360*	.15
7. [Coping] + Monitoring	.101	7-13 = .015	2.352	.02
8. [Coping] + Decision-Making	.129	8-13 = .043	6.961*	.05
9. [Coping] + Learning from mistakes	.114	9-13 = .028	4.456*	.03
10.[Coping]+ Persistence	.168	10-13 = .082	13.896*	.10
11. [Coping] + Creativity	.147	11-13 = .061	10.083*	.07
12.[Coping] + Mindful Awareness	.152	12-13 = .066	10.974*	.08
13. [Coping]	.086			

* p ≤ .01

The **set** of coping variables (which include the COPE subscale categories of *problem-focused*, *emotion-focused*, and *dysfunctional coping*) collectively explain only 3.0% of the variance in primary healthcare nurses' depression. The contribution of this set of variables is not statistically significant at the 1% level. When examining the individual coping scales, it is also evident from Table 5.8 that none of the individual scales manage to explain a significant percentage of the variance in depression among primary healthcare nurses.

The **set** of self-regulation variables explains 11.89% of the variance in primary healthcare nurses' depression. This contribution is significant at the 1% level [F9;136 = 3.360; p ≤ .01]. The corresponding effect size of .15 indicates that the result has a medium practical importance. This means that the combined subscale of self-regulation provides a moderate and relevant contribution to explaining depression among primary healthcare nurses. When looking at the individual self-regulation scales, it is clear from Table 5.8 that five of the SSRQ subscales, namely *decision-making* [F4;141 = 6.961; p ≤ .01], *learning from*

mistakes [$F_{4;141} = 4.456$; $p \leq .01$]; *persistence* [$F_{4;141} = 13.896$; $p \leq .01$]; *creativity* [$F_{4;141} = 10.083$; $p \leq .01$] and *mindful awareness* [$F_{4;141} = 10.974$; $p \leq .01$] do explain a significant percentage of the variance in depression at the 1% level. However, the corresponding effect sizes range between .10 and .02, indicating that the results may not be of practical significance.

5.7 The Contribution of Self-Regulation and Coping to Anxiety

To fully investigate the research objective, a hierarchical regression analysis was once again conducted with the percentage variance of the criterion explained by each of the predictor variables, indicated by R^2 . The significance of the difference in R^2 that occurs will also be calculated using the hierarchical F-test, while effect sizes (f^2) will also be computed and demonstrated. The results of anxiety as the dependent variable are shown in Table 5.9. As previously noted, Cohen (1992) reported that, for hierarchical multiple regression analysis, an effect size of .02 is small, .15 is moderate, and .35 is large. The results are shown in Table 5.9 for *anxiety* as a dependent variable.

The results in Table 5.9 firstly indicate that all the predictor variables collectively explain 17.2% ($R^2 = 0.172$) of the variance in *anxiety* scores among the primary healthcare nurses who participated in this study. This calculated R^2 value is significant at the 1% level [$F_{9;1360} = 3.316$; $p = .002$]. The set of coping variables (*problem-focused*, *emotion-focused*, and *dysfunctional coping* COPE subscale scores) collectively explains only 1.6% of the variance in primary healthcare nurses' anxiety, which is not statistically significant at the 1% level. When examining the individual coping scales, it is evident from Table 5.9 that none of the individual scales manage to explain a significant percentage of the variance in anxiety among primary healthcare nurses.

Table 5.9*Contributions of Self-regulation and Coping to R² for Anxiety*

Variables	R ²	Contribution to R ² : Full minus reduced model	F	f ²
1. [self-regulation] + [coping]	.172	1-5 = .016	.876	.02
2. [self-regulation] + Problem-focused	.156	2-5 = .000	-	-
3. [self-regulation] + Emotion-focused	.156	3-5 = .000	-	-
4. [self-regulation] + Dysfunctional	.172	4-5 = .016	2.667	.02
5. [self-regulation]	.156			
6. [Coping]+[self-regulation]	.172	6-13 = .120	3.285*	.15
7. [Coping] + Monitoring	.077	7-13 = .021	3.819*	.03
8. [Coping] + Decision-Making	.124	8-13 = .072	11.589*	.09
9. [Coping] + Learning from mistakes	.111	9-13 = .059	9.358*	.07
10.[Coping]+ Persistence	.129	10-13 = .077	12.465*	.09
11.[Coping] + Creativity	.113	11-13 = .061	9.697*	.07
12.[Coping] + Mindful Awareness	.122	12-13 = .070	11.241*	.08
13.[Coping]	.052			

* p ≤ .01

The set of self-regulation variables explains 12.0% of the variance in primary healthcare nurses' anxiety. This contribution is significant at the 1% level [$F_{9;136} = 3.285$; $p \leq .01$]. The corresponding effect size of .15 indicates that the result has medium practical importance. This means that the combined subscale of self-regulation provides a moderate and relevant contribution to explaining anxiety among primary healthcare nurses. When looking at the individual self-regulation scales, it is clear from Table 5.9 that all six subscales, namely *monitoring* [$F_{4;141} = 3.819$; $p \leq .01$]; *decision-making* [$F_{4;141} = 11.589$; $p \leq .01$], *learning from mistakes* [$F_{4;141} = 9.358$; $p \leq .01$]; *persistence* [$F_{4;141} = 12.465$; $p \leq .01$]; *creativity* [$F_{4;141} = 9.697$; $p \leq .01$] and *mindful awareness* [$F_{4;141} = 11.241$; $p \leq .01$], statistically explain a significant percentage of the variance in anxiety at the 1% level. However, the corresponding effect sizes range between .09 and .03, suggesting that the results are not of practical significance.

5.8 The Contribution of Self-Regulation and Coping to Stress

The results of stress as the dependent variable are shown in Table 5.10. In interpreting these findings, the researcher again considered Cohen's (1992) guidelines that, for hierarchical multiple regression analysis, an effect size of .02 is small, .15 is moderate, and .35 is large. The results of stress as the dependent variable are shown in Table 5.10.

Table 5.10

Contributions of Self-regulation and Coping to R^2 for Stress

Variables	R^2	Contribution to R^2 : Full minus reduced model	F	f^2
1. [self-regulation] + [coping]	.206	1-5 = .034	1.941	.05
2. [self-regulation] + Problem-focused	.172	2-5 = .000	-	-
3. [self-regulation] + Emotion-focused	.178	3-5 = .006	1.007	.01
4. [self-regulation] + Dysfunctional	.195	4-5 = .023	3.942*	.03
5. [self-regulation]	.172			
6. [Coping]+[self-regulation]	.206	6-13 = .118	3.369*	.15
7. [Coping] + Monitoring	.112	7-13 = .024	3.811*	.03
8. [Coping] + Decision-Making	.150	8-13 = .062	10.284*	.08
9. [Coping] + Learning from mistakes	.125	9-13 = .037	5.962*	.05
10. [Coping]+ Persistence	.176	10-13 = .088	15.058*	.11
11. [Coping] + Creativity	.144	11-13 = .056	9.224*	.07
12. [Coping] + Mindful Awareness	.141	12-13 = .053	8.699*	.07
13. [Coping]	.088			

* $p \leq .01$

The results in Table 5.10 firstly indicate that all the predictor variables collectively explain 20.6% ($R^2 = 0.206$) of the variance in anxiety among the primary healthcare nurses. This calculated R^2 value is significant at the 1% level [$F_{9;1360} = 3.932$; $p = .001$]. The set of coping variables (the combined *problem-focused*, *emotion-focused* and *dysfunctional* coping categories on the COPE) collectively explain only 3.4% of the variance in primary healthcare nurses' stress, which is not statistically significant at the 1% level. When examining the individual coping scales, it is evident from Table 5.10 that Dysfunctional coping does succeed in explaining a significant percentage of the variance in stress among primary

healthcare nurses at the 1% level. However, the corresponding effect size of .03 indicates that the result is not of any practical significance.

The set of self-regulation variables explains 11.8% of the variance in primary healthcare nurses' *stress* subscale score. This contribution is significant at the 1% level [$F_{9;136} = 3.369$; $p \leq .01$]. The corresponding effect size of .15 once again indicates that the result has medium practical importance. This means that the combined subscale of self-regulation provides a moderate and relevant contribution to explaining stress among primary healthcare nurses. When looking at the individual self-regulation scales, it is clear from Table 5.10 that all six subscales, namely *monitoring* [$F_{4;141} = 3.811$; $p \leq .01$]; *decision-making* [$F_{4;141} = 10.284$; $p \leq .01$], *learning from mistakes* [$F_{4;141} = 5.962$; $p \leq .01$]; *persistence* [$F_{4;141} = 15.058$; $p \leq .01$]; *creativity* [$F_{4;141} = 9.224$; $p \leq .01$] and *mindful awareness* [$F_{4;141} = 8.699$; $p \leq .01$], do statistically explain a significant percentage of the variance in stress at the 1% level. However, the corresponding effect sizes range between .11 and .03, which suggests that these results are not of any practical significance.

5.9 Summary

A total of 146 primary healthcare nurses from Lejweleputswa clinics in the Free State participated in this study. The statistical analyses that were conducted on the collected data included the Pearson product-moment correlation coefficient analyses, analyses of variance, and hierarchical multiple regression analyses. Firstly, observations regarding the sample's demographics and reported COVID-19 exposure help contextualise the findings from the data analysis.

The demographic variables in this study consisted of almost half of the sample (47.9%) aged between 31 and 40 years, followed by the ages 41-50. Furthermore, more

than half (61.6%) of the participants were female. Regarding professional experience, approximately half had less than 5 years of work experience, the other half reported between 6 and 10 years, and a small portion (13%) reported over 10 years in the field. The nurses experienced significant exposure and impacts related to COVID-19. Almost two-thirds (63%) reported a coronavirus infection during the pandemic, and 74.7% reported at least one isolation period due to COVID-19 exposure. SARS-CoV-2 testing seemed widespread and was reported by the majority of participants (86.3%). Most (79.5%) reported losing a relative or colleague to COVID-19.

The reliability of the instruments used was evaluated through the calculation of Cronbach's alpha coefficient. Acceptable reliability coefficients ($\geq .7$) were found for the DASS-21 and COPE subscales. However, the SSRQ subscales showed lower reliability in this sample, with coefficients ranging between .538 and .665. The self-evaluation subscale showed unacceptably low reliability and was excluded from further data analysis procedures.

Pearson's product-moment correlation coefficients were used to examine whether significant relationships existed between the three mental health concerns and scores obtained on the self-regulation or coping measures. Effect sizes were interpreted following Cohen's guidelines (1992), with only medium and large effect sizes highlighted here. Firstly, strong positive correlations were found between the three DASS-21 subscales, indicating that participants tended to report interconnected mental health challenges instead of isolated concerns. Depression and anxiety showed a strong positive correlation (0.78), as did anxiety and stress (0.81). Secondly, the SSRQ similarly demonstrated strong positive correlations between many subscales, suggesting frequent co-use of self-regulation

strategies. These findings suggest that participants who employed one self-regulation strategy were also likely to use others. Thirdly, problem-focused and emotion-focused coping strategies demonstrated a strong positive correlation, suggesting that participants who reported reliance on problem-solving strategies would also be more likely to use emotion-focused coping and *vice versa*. The fourth correlational finding refers to gender being the only demographic variable that proved to have a statistically significant effect. Male participants obtained a significantly higher mean score on depression than the female nurses, whilst female participants nurses obtained a significantly higher mean score on creativity. Lastly, the results indicated a moderately strong negative relationship between all the measured mental health concerns (depression, anxiety and stress) and self-regulation strategies, with negative correlations of moderate strength observed. Higher *depression* scores were associated with lower persistence (-0.37) and lower mindfulness (-0.33). Higher *anxiety* scores also correlated negatively with persistence (-0.33), mindfulness (-0.32), and decision-making (-0.32), with *stress* scores following the same pattern: persistence (-0.37), mindfulness (-0.30) and decision-making (-0.32).

Hierarchical regression analyses were conducted to investigate the contributions of self-regulation and coping strategies to the increased rates of depression, anxiety, and stress reported by the sample. Coping subscale categories failed to explain a significant percentage of variance in the reported depression, anxiety, or stress. The combined self-regulation subscales, however, explained 11.89% of the variance in depression, 12% of the variance in anxiety and 11.8% of the variance in stress. The hierarchical multiple regression conducted indicated that when used in combination, the self-regulation subscales were significant at a statistical level and with a medium effect size in the prediction of mental health outcomes. This means that the combined subscale of self-regulation provides a moderate and relevant

contribution to explaining elevated depression, anxiety and stress scores among the primary healthcare nurses who participated in this study.

5.10 Conclusion

The findings from the different types of statistical analyses conducted in this study were presented in this chapter. This included an overview of the samples' demographic characteristics, as well as the analyses of the mean scores and standard deviations of the scales used, followed by the results in terms of the measures' skewness, kurtosis, and the measurement of their internal consistencies to determine subscale inclusion in the analysis. Thereafter, the results of correlational analyses and analyses of variance, followed by hierarchical multiple regression analyses, were presented. The next chapter contains a discussion of these results.

CHAPTER SIX

DISCUSSION, LIMITATIONS, RECOMMENDATIONS, AND CONCLUSION

6.1 Introduction

This chapter discusses the results obtained from this study by comparing them to the existing research on the variables under study, explicitly focusing on South African findings with comparable samples. This discussion will first consider the findings related to the sample and the properties of the measuring instruments used in data collection, whereafter the results from the correlational analyses and hierarchical regression analyses will be discussed as they relate to existing literature. The limitations of this study will be detailed and followed by recommendations for future research and practice. Lastly, the chapter concludes by summarising the study and its valuable aspects.

6.2 Discussion of the Results

This section contains a discussion of the findings of the study in relation to existing research. This includes a discussion of the findings related to the participants included in this study and the measuring instruments used for data collection.

6.2.1 Study Participants and Their Reported COVID-19 Exposure

The sample in this study is mostly female (61%), although female gender was reported at a lower frequency when compared to the trends in other local studies. The sample in the Engelbrecht et al. (2020) study consisted of 86.7% female participants. Similarly, 81% of the participants were female HCWs in the Stals et al. (2024) study, and in the Lee et al. (2022) study, 84.9% of the sample were women. Ramlagan et al. (2024) reported that 71% of their participants were female HCWs. Given that nursing in South

Africa is still a female-dominated profession (Shakwane, 2022) and the agreement with other similar local samples, it could be argued that this study's sample could be seen as representative of the local population of nursing practitioners.

Almost half of the participants in this study reported between 1 and 5 years of experience in their profession, with a small minority (13%) reporting having worked for more than 10 years in the field. In comparing this to other local studies that reported on the duration of work experience, the sample in this study seemed slightly less experienced than that of Stals et al. (2024), whose study included 27.8% of participants who had been in the field for 0-5 years, and 27.4% had been working for 5-10 years. Similarly, the median years of practice in the Lee et al. (2022) study, was 8 years. This could potentially be attributed to the purposive selection of the primary healthcare setting of this research study, in contrast to most other local research which focused on HCWs across the different levels of care, including specialised tertiary health facilities.

This study's sample reported a high rate of COVID-19 exposure, with 86.3% of the participants reporting previous coronavirus laboratory testing and two-thirds (63%) of the sample testing positive for COVID-19 at some point during the pandemic. In contrast, lower rates of confirmed infections were noted in other studies that reported on the COVID-19 positive test results among their participants. Lee et al. (2022) reported that only a small 10% fraction of their participants (all sampled from a tertiary public healthcare facility) reported previously testing positive for COVID-19. Nearly a third (32.5%) of the nursing participants in the Engelbrecht et al. (2020) study, who were sampled across different healthcare and training facilities had also tested positive. It should be noted that the rates of coronavirus testing were not reported for the samples in these two studies. Therefore, the

sample in this study could possibly represent either a cohort of HCWs who were more exposed to infection, or simply to SARS-Cov-2 testing. Potential discrepancies across study sites regarding the availability of and protocols for coronavirus testing might explain these differences, as well as the higher patient turnover at primary healthcare clinics versus at tertiary specialised hospitals. To better view the exposure to infection, it might be beneficial to consider this sample's reported rates of post-exposure protocols in the form of self-isolation. Almost three-quarters of participants (74.7%) reported at least one COVID-19-related isolation period. These high rates of isolation are even lower than those reported by Engelbrecht et al. (2021), whereby nearly all participants had to undergo isolation procedures, with 91.4% of nurses reporting self-isolation and 5% reporting isolation in a facility. Therefore, it may be that post-exposure testing might have been a more frequently used protocol than isolation among the primary healthcare nurses who participated in this study, as this could have possibly reduced further staff absences.

Apart from their personal exposure to coronavirus infection, the vast majority of participants (79.5%) indicated being affected by the pandemic by losing a relative or colleague due to COVID-19. It may, therefore, partly explain the elevated mental health concerns in this sample. A high rate of impact was reported in another local study, where 90% of participants knew of a colleague who had been diagnosed with COVID-19 (Engelbrecht et al., 2021).

6.2.2 Measuring Instruments Used

The study made use of three measuring instruments to obtain data. The *Short Self-Regulation Questionnaire (SSRQ)*, the *Depression, Anxiety and Stress Scale – 21 items (DASS-21)* and the *Coping Orientations to Problems Experienced Questionnaire (COPE)*. Table 5.2

contained Cronbach's α coefficients obtained for these instruments during the analysis. The coefficients displayed ranged from $\alpha = .36$ to $.86$. With the exception of one scale (*SSRQ: self-evaluation*), the researcher decided to use them in the analysis. The results of the individual scales are explored below.

6.2.2.1 Depression, Anxiety and Stress Scale

The Cronbach's α coefficients for the three subscales of the DASS-21 indicated a satisfactory level of reliability for this scale. Therefore, the results from this instrument were included in further analyses. The obtained Cronbach's α coefficients for the subscales of the DASS-21 ($\alpha = .81$, anxiety $\alpha = .89$ and stress $\alpha = .78$, respectively) were in accordance with previous investigation of its psychometric properties conducted in Nigeria (Coker et al., 2018).

Overall, average scores for the whole sample on the three scales suggest elevated levels of mental health symptoms (Table 5.3). This is in line with other South African findings that suggest that over half of the nurses in their national sample could be classified as psychologically distressed (Ramlagan et al., 2024). Similarly, a rapid review conducted in the early phases of the pandemic noted that mental health conditions had been well-documented among HCWs during disease outbreaks, including COVID-19 (Robertson et al., 2020). Firstly, the mean score for the *depression* subscale for this study's sample was 14.45, suggesting that participants, on average, reported moderate levels of depression from the measure. This finding does not correlate with those from the international systematic review by Pappa et al. (2020), the majority of HCWs experienced mild depressive symptoms. However, the results could be interpreted against the backdrop of the local findings of Mbunge (2020), who reported that mental health concerns increased drastically across the

South African population, further evidenced by increased rates of gender-based violence cases. Lee et al. (2022) also stated that 49% of their HCW participants expressed worsened feelings of unhappiness and depression.

Secondly, participants obtained a mean score on the *anxiety* subscale of 15. This suggests that participants, on average, reported severe levels of anxiety on this measure. This contrasts even more sharply with the results of the systematic review by Pappa et al. (2020), in which significant anxiety was found for 23.21% of HCWs, with the majority of HCWs only reporting mild anxiety symptoms.

Thirdly, for the DASS-21 *stress* subscale, the average score in this study was 16.7, indicating that participants reported mild stress levels. Human et al. (2023) reported that HCWs who had lower levels of coping showed more symptoms of post-traumatic stress symptoms. A systematic review by Umbetkulo et al. (2024) explained that the increased fear of infection corresponded to the high levels of psychological distress exhibited by HCW, and this was attributed to the nature of their exposure as frontline workers, being overworked and their reported concern of contracting the virus.

6.2.2.2 *The Short Self-Regulation Questionnaire*

The retained scales from the SSRQ obtained Cronbach's α coefficients ranging from .538 to .665. This indicates that the internal reliability observed in the sample ($n = 146$) was sufficient (Vogt, 2005). These coefficients are, however, lower than those from previous South African research that reported $\alpha = .895$ (Potgieter & Botha, 2009). Therefore, while SSRQ was considered appropriate to use in this context, one should be cautious when interpreting results obtained from its application, especially in populations with participants who are undergoing psychological struggles. To remove the impact of the low reliability

coefficient in this sample on the single-item SSRQ scale of *Self-evaluation* ($\alpha = .360$), the participant's scores obtained on this scale were not included in the analysis and should be kept in mind when comparing SSRQ results across studies.

6.2.2.3 *Coping Orientations to Problems Experienced Questionnaire*

The calculation of Cronbach's α coefficients for the COPE scale resulted in satisfactory psychometric properties, with coefficients ranging between $\alpha = .741$ and $\alpha = .799$ for the three scales, namely *problem-focused strategies*, *emotion-focused strategies*, and *dysfunctional strategies* (see Table 5.2). These results compared well with previous research, in which measuring the item-total correlation coefficient and Cronbach's α coefficients of the COPE inventory resulted in internal consistency and Cronbach's α coefficients between 0.89 and 0.86 (Du Plessis, 2012).

6.2.3 *Discussion of Correlational Findings*

6.2.3.1 *Correlations of Study Variables with Demographic Variables*

Pearson product-moment correlational coefficients were calculated for all predictor and outcome variables that obtained a sufficient level of internal reliability. The analysis involved analysing data obtained relating to the DASS-21 scale, SSRQ scale and the COPE. As previously mentioned, only those findings that were statistically significant at the 5% level or higher, with moderate to large practical significance indicated by effect size, will be discussed. For this determination, a correlation of .10 indicated a small effect size, a correlation of .30 indicated a moderate effect size and a correlation of .50 indicated a large effect size (Cohen, 1988). The findings that meet these criteria from these correlational

analyses of the demographic variables and the variables under study (coping, self-regulation and mental health concerns), are included in this discussion.

Firstly, the researcher investigated if any statistically significant differences existed in the mean scores of mental health concerns (depression, anxiety and stress) between the respective age and gender groups, as well as between groups of differing work experience (in years) and previously testing positive for COVID-19. No differences were found in this study on any demographic variable apart from gender, which was the only demographic factor that demonstrated a significant difference between groups on the other variables under investigation in this study. These results differ in part from other studies conducted during the pandemic, such as the findings presented by Yildirim et al. (2020), who found significant correlations between psychological distress not only with gender but also with age. Age demonstrated a significant relationship with psychological distress across other studies, with the highest well-being found among HCWs above the age of 50 (McFadden et al., 2021), and younger HCWs being more inclined to report elevated stress levels (Di Trani et al., 2021) and elevated health anxiety (Yildirim et al., 2020). Even local researchers (Ramlagan et al., 2024) found that older HCWs from across South Africa were less likely to report psychological distress than their younger colleagues.

Statistically significant differences in the means of the two gender groups were found for Depression (on the 5% level; $p = .021$), as male participants obtained a significantly higher mean score on depression than female participants. The effect size for this result was medium (see Table 5.6). Therefore, the findings on gender differences in this study were unexpected, as women were previously found to have higher self-reported psychological distress (Di Trani et al., 2021; Pappa et al., 2020; Ramlagan et al., 2024; Sirois

& Owens, 2021; Yildirim et al., 2020) and lower wellbeing scores (McFadden et al., 2021). However, higher rates of depressive symptoms among male participants have also been reported, such as by Song et al. (2020), who found male HCWs to be at higher risk for depression and post-traumatic stress symptoms.

Statistically significant differences in the means of the two gender groups were also found for *Creativity* as an SSRQ scale (on the 1% level; $p = .002$). A medium effect size was found for this result (see Table 5.6). The female healthcare nurses obtained a significantly higher mean score on creativity than their male counterparts. Although such findings on self-regulation from other studies are lacking, gender differences in coping were also observed by Chen et al. (2021), who found that female frontline medical staff scored higher in secondary appraisal than their male colleagues (Chen et al., 2021).

6.2.3.2 *Correlations between Mental Health Concerns, Self-regulation and Coping*

Pearson product-moment correlational coefficients were calculated with the use of the results from the measurements for depression, anxiety and stress (using the DASS-21), self-regulation (using the SSRQ) and coping (using the COPE) (See Table 5.7). The results pertaining to the three mental health difficulties investigated in this study are considered first in this discussion, whereafter the relationship between the different components of self-regulation and coping will be discussed. The DASS-21 scores obtained by the participants on the Depression, Anxiety and Stress subscales showed relatively strong positive correlations (0.78 and 0.84). Similarly, scores on the Anxiety subscale showed relatively strong positive correlations to those on the Stress subscale (0.81). These findings suggest that participants who reported one mental health concern also tended to report higher levels of another concern. This could indicate the vulnerability of this sample, who,

on average, obtained anxiety scores that fall into the “severe” category, to experience multiple mental health concerns. In the Yildirim et al. (2020) study of healthcare worker’s psychological status, significant correlations were similarly found between scores on depression (the Beck Depression Inventory) and health anxiety measures (Health Anxiety Inventory).

When the data were analysed to investigate the relationship between mental health concerns on the one hand and coping and self-regulation on the other, specific patterns were observed. The results from the correlational analysis revealed that mental health concerns (as measured by the DASS-21 scales for depression, anxiety and stress) did not reveal any significant correlations in any direction for any of the coping strategies measured by the COPE. Engelbrecht et al. (2021) found an association between avoidant coping styles and PTSD, with an increased focus on solving the problem instead of dealing with the resultant emotions and high rates of avoidant coping styles reported, including self-distraction, denial, venting, substance use, behavioural coping strategies (Engelbrecht et al., 2021). A study by Scheunemann et al. (2023) on coping strategies employed by public psychiatric HCWs in Gauteng during the COVID-19 pandemic, identified intrapersonal factors involved in coping, which determine an individual’s ability to maintain well-being and continue functioning. The HCWs reported that in order to better cope during the pandemic, they focused on the following; acquiring knowledge about SARS-CoV-2 transmission and how to protect themselves, attempting to adopt a positive mindset and attitude towards stressors, accepting the situation and noting its impact, planning a response to the situation and taking action, as well as distracting themselves with enjoyable activities (Scheunemann et al., 2023).

The correlational analysis revealed significant relationships between the three mental health concerns and aspects of self-regulation measured by the SSRQ. Firstly, the DASS-21 scores for anxiety showed moderately strong negative correlations with *decision-making* (-0.32), *persistence* (-0.33) and *mindfulness* (-0.32) as measured by these SSRQ scales. DASS-21 scores for *stress* also showed moderately strong negative correlations with the same SSRQ subscales: *decision-making* (-0.32), *persistence* (-0.33) and *mindfulness* (-0.32). The SSRQ scales of *persistence* and *mindfulness* results also showed a moderately strong negative relationship (-0.37 and -0.33) with *depression* (as reported on the DASS-21).

Therefore, participants who reported more severe anxiety and stress likely scored lower on certain aspects of self-regulation, namely decision-making, persistence and mindfulness as self-regulation strategies. Similarly, the higher the depression score was for participants, the lower their persistence and mindfulness tended to be. These aspects of self-regulation, therefore, seem to be reportedly less prominent in individuals when mental health concerns are present. These findings reflect the assertion by Simon and Duran-Bush (2015) that self-regulation plays an important role in the psychological well-being of HCWs. Furthermore, Cloete et al. (2012), found a negative association between self-regulation and psychopathology. Tlotleng et al. (2021) also further concluded that participants with better self-regulation were less likely to fall into the classification categories of mental disorders, such as depression.

6.2.4 Discussion of Hierarchical Multiple Regression Analysis

Hierarchical multiple regression analyses were conducted with self-regulation as the criterion variable. All predictor variables that obtained sufficient internal reliability were included in the analysis. The analysis involved analysing data obtained from the different

subscales of the DASS-21, SSRQ and COPE (see Tables 5.8 – 5.10 for the multiple hierarchical regression analysis results).

6.2.4.1 Contributions of Self-Regulation and Coping to Depression

All the predictor variables, namely the scores on the coping scale and on the self-regulation scale, collectively explain 20.4% ($R^2 = 0.204$) of the variance in depression among primary healthcare nurses, which is significant at the 1% level [$F_{9;1360} = 3.873$; $p = .001$]. The results from the three coping scales (*problem-focused*, *emotion-focused*, and *dysfunctional coping*) collectively explain only 3.0% of the variance in primary healthcare nurses' depression, which is not statistically significant.

None of the individual scales manage to explain a significant percentage of the variance in depression among primary healthcare nurses. In contrast, the combined self-regulation scales explain 11.89% of the variance in primary healthcare nurses' depression, with a medium practical importance calculated for this finding. This means that the combined subscale of self-regulation provides a moderate and relevant contribution to explaining depression among primary healthcare nurses. When looking at the individual self-regulation scales, some, such as decision-making, *learning from mistakes*, *persistence*, *creativity* and *mindful awareness* do statistically explain a significant percentage of the variance in depression at the 1% level. However, their small corresponding effect sizes indicate that the results are not of practical significance. Therefore, the findings do not suggest that the application of any one of these subscales would be useful in practice as a means of identifying HCWs at risk for depressive symptoms, whilst the use of the full SSRQ measure might be more appropriate.

6.2.4.2 Contributions of Self-Regulation and Coping to Anxiety

All the predictor variables collectively explain 17.2% ($R^2 = 0.172$) of the variance in anxiety among primary healthcare nurses, which was significant at the 1% level [$F_{9;1360} = 3.316$; $p = .002$]. The results from the three coping scales (*problem-focused*, *emotion-focused*, and *dysfunctional coping*) collectively explain only 1.6% of the variance in primary healthcare nurses' anxiety, a non-statistically significant result at the 1% level. Neither do any of the individual scales manage to explain a significant percentage of the variance in anxiety among primary healthcare nurses. These results differ from previous research on coping and anxiety, which was concluded by Alhasan et al. (2021) that the inability to cope positively with COVID-19 contributed to the development of anxiety disorders.

However, the combined scales of the self-regulation measure explain 12.0% of the variance in primary healthcare nurses' anxiety, which is significant at the 1% level [$F_{9;136} = 3.285$; $p \leq .01$ with an effect size (.15) indicative of medium practical importance. This means that the combined subscale of self-regulation provides a moderate and relevant contribution to explaining anxiety among primary healthcare nurses. All six self-regulation scales individually explain a significant percentage of the variance in anxiety at the 1% level. However, the small corresponding effect sizes (ranging between .03 and .09), indicate that these individual contributions results are not of practical significance. Therefore, the findings do not suggest that the application of any one of these subscales would be useful in practice as a means of identifying HCWs at risk for anxiety symptoms, whilst the use of the full SSRQ measure might be more appropriate to this end.

6.2.3.3 Contributions of Self-Regulation and Coping to Stress

The results in Table 5.10 firstly indicate that all the predictor variables collectively explain 20.6% ($R^2 = 0.206$) of the variance in anxiety among the primary healthcare nurses.

This calculated R^2 value is significant at the 1% level [$F_{9;1360} = 3.932$; $p = .001$]. The set of coping variables (*problem-focused*, *emotion-focused*, and *dysfunctional coping*) collectively explain only 3.4% of the variance in primary healthcare nurses' stress. However, the contribution of this set of variables is not statistically significant at the 1% level. When examining the individual coping scales, it is evident from Table 5.10 that *dysfunctional coping* does succeed in explaining a significant percentage of the variance in stress among primary healthcare nurses at the 1% level. However, the corresponding effect size of .03 indicates that the result is not of any practical significance. Therefore, across all three mental health concerns, none of the COPE subscale categories demonstrated predictive utility in identifying symptomatic HCWs.

These findings are contrary to Engelbrecht et al. (2021) who found that avoidant coping is associated with Post Traumatic Stress Disorder. In that study, HCWs resorted to dysfunctional avoidance-based coping strategies when faced with uncontrollable situations, seemingly related to their development of PTSD symptoms (Engelbrecht et al., 2021). Therefore, this study's focus on depression, anxiety and stress to the exclusion of trauma-related symptoms, potentially misses the COPE's role in predicting HCWs with a broader range of mental health concerns in the wake of the pandemic, especially given that post-traumatic stress symptoms may develop insidiously or in a delayed trajectory after the traumatic exposure (American Psychiatric Association, 2022). D'Ettorre et al. (2021) also found in a systematic review that a passive coping style was associated with post-traumatic stress during COVID-19. Hence, the investigation into the role of coping in the psychological well-being of HCWs, should continue to be explored.

The set of self-regulation variables explains 11.8% of the variance in primary healthcare nurses' stress. This contribution is significant at the 1% level [$F_{9;136} = 3.369$; $p \leq .01$]. The corresponding effect size of .15 once again indicates that the result has medium practical importance. This means that the combined subscale of self-regulation provides a moderate and relevant contribution to explaining stress among primary healthcare nurses. When looking at the individual self-regulation scales, it is clear from Table 5.10 that all six scales included in the analysis statistically explain a significant percentage of the variance in stress at the 1% level. However, the corresponding effect sizes range between .11 and .03, indicating that the results are not of any practical significance. Therefore, the findings do not suggest that the application of any one of these subscales would be clinically useful in identifying HCWs at risk for stress symptoms, whilst the use of the full SSRQ measure might be more appropriate to this end.

6.3 Summary

The analysis indicates that the set of coping scales does not successfully explain a significant percentage of the variance in depression, anxiety, or stress among primary healthcare nurses. On the other hand, the set of self-regulation scales does manage to explain a significant percentage of the variance in all three mental health concerns. Moreover, these self-regulation scales yield medium effect sizes, signifying that the results hold medium practical importance.

These findings align with existing literature that suggests self-regulation skills play a crucial role in individuals' mental health and well-being. Studies have highlighted the significance of self-regulation in managing emotions, adapting to stressors, and maintaining psychological resilience. The observed medium effect sizes in this study further support the

notion that enhancing self-regulation skills could lead to meaningful improvements in addressing depression, anxiety, and stress among primary healthcare nurses.

The lack of substantial explanatory power in the coping scales, in contrast, might be attributed to the complexity of mental health concerns. Coping strategies, while important, might not capture the comprehensive nature of these concerns in the context of primary healthcare nurses. This underscores the need for interventions and support mechanisms that go beyond mere coping strategies and delve into fostering self-regulation abilities.

Overall, these findings contribute to the broader understanding of mental health factors among primary healthcare nurses and underscore the potential effectiveness of interventions focused on enhancing self-regulation skills. Programmes aimed at providing support to nurses in public healthcare can focus on training nurses in skills for mindful self-care, resilience, and overcoming stress and burnout. Occupational Health should not only arrange for mental health services during times of crisis, but psychological help should be available on an ongoing basis, with proactive interventions focusing on self-regulation, mindfulness and stress reduction. Nurses themselves should practice more self-care, engage in activities that relieve stress and obtain support from relevant people in their lives. Further research could delve into the specific aspects of self-regulation that hold the most impact and explore how tailored interventions can be designed to support healthcare professionals in managing their mental health challenges effectively.

6.4 Limitations of the Study

It should be taken into consideration that this study has a number of limitations. Firstly, there was an uneven number of participants who took part in the study in different clinics. This is a result of the voluntary nature of the study and the fact that different clinics

had different numbers of HCWs. Additionally, some questionnaires contained many incomplete items which led to them not being included in the data analysis process. Receiving incomplete questionnaires limited the sample pool to exactly 146, which was the minimum required in the sample size determination.

The use of non-probability convenience sampling meant that the ability of the results to be generalised was limited due to the possibility that the samples obtained in this study were not representative of the broader population. Another limitation that should be noted was the use of self-report measures. Although measures were taken to limit reactive responding, it remained possible that participants could have responded inaccurately to respond in a socially desirable manner.

6.5 Recommendations for Future Research

As self-regulation outperformed coping in the prediction of mental health concerns, it is recommended that continuous research be undertaken on self-regulation and its influence on HCWs' mental health. Specifically in developing countries such as South Africa, where public healthcare systems are often under-resourced, targeted screening and intervention strategies are required to enhance efficacy and availability. It is important for the government, private sector, WHO and the general population to give more attention to HCWs' mental health, as this will improve social stability, security and economic growth within the African continent (Chersich et al., 2020). Further research into Free State province HCWs can shed light on how self-regulation, coping skills and the effects of these factors develop. Understanding these better would assist in better mental health management amongst HCWs during pandemics and better service delivery by HCWs during

stressful situations in their work contexts. In addition, further research can delve more into the specific aspects of self-regulation that are most impactful in the mental health of HCWs and develop interventions that can be designed in order to support healthcare professionals in managing their mental health during challenges.

Further studies should also consider the subjective and more descriptive experiences of nurses in South Africa regarding COVID-19 and what they consider its effects on them to have been, as well as their views regarding improving their mental health and work satisfaction overall. This calls for more qualitative research, which echoes the recommendations by Billings et al. (2021) to explore the subjective experiences of HCWs, who have not been offered the opportunity to share their needs and preferences. Billings et al. (2021) further proposed that the mental health impact of COVID-19 can still be mitigated by developing interventions that have been evaluated in their timing, effectiveness, and acceptability to prevent and manage psychological distress among HCWs.

6.6 Conclusion

This chapter provided a discussion of the results of the data analysis procedures. The findings were considered and interpreted in the context of existing research, with a summative section reflecting the value of this study in terms of the implications of the findings. Furthermore, the limitations of this study were explored, with recommendations for future research proposed.

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APPENDIX A**HEALTH SCIENCES RESEARCH ETHICS COMMITTEE APPROVAL LETTER**

UNIVERSITY OF THE
FREE STATE
UNIVERSITEIT VAN DIE
VRYSTAAT
YUNIVESITHI YA
FREISTATA



UFS·UV
HEALTH SCIENCES
GESONDHEIDSWETENSAPPE

Health Sciences Research Ethics Committee

11-Jul-2022

Dear **Mrs Mpiki Tsoeli**

Ethics Clearance: Self-regulation and coping as predictors of mental health concerns among primary healthcare nursing staff during the COVID-19 pandemic

Principal Investigator: **Mrs Mpiki Tsoeli**

Department: **Psychology Department (Bloemfontein Campus)**

[Submission Page](#)

APPLICATION APPROVED

Please ensure that you read the whole document

With reference to your application for ethical clearance with the Faculty of Health Sciences, I am pleased to inform you on behalf of the Health Sciences Research Ethics Committee that you have been granted ethical clearance for your project.

Your ethical clearance number, to be used in all correspondence is: **UFS-HSD2022/0155/2607**

The ethical clearance number is valid for research conducted for one year from issuance. Should you require more time to complete this research, please apply for an extension.

We request that any changes that may take place during the course of your research project be submitted to the HSREC for approval to ensure we are kept up to date with your progress and any ethical implications that may arise. This includes any serious adverse events and/or termination of the study.

A progress report should be submitted within one year of approval, and annually for long term studies. A final report should be submitted at the completion of the study.

Research conducted in any Department of Health facility: Researchers are required to sign and return the HSREC approval letters to the provincial Department of Health where they applied. It is also a requirement for researchers to submit electronic copies of their final research findings, and/or make a presentation of their findings and recommendations at departmental research days when and where indicated.

The HSREC functions in compliance with, but not limited to, the following documents and guidelines: The SA National Health Act. No. 61 of 2003; Ethics in Health Research: Principles, Structures and Processes (2015); SA GCP(2020); Declaration of Helsinki; The Belmont Report; The US Office of Human Research Protections 45 CFR 461 (for non-exempt research with human participants conducted or supported by the US Department of Health and Human Services- (HHS), 21 CFR 50, 21 CFR 56; CIOMS; ICH-GCP-E6 Sections 1-4; International Council for Harmonisation (ICH) Harmonised Guideline, Integrated Addendum to ICH E6(R1), Guideline for Good Clinical Practice (GCP) E6(R2), 2016, SAHPRA Guidelines as well as Laws and Regulations with regard to the Control of Medicines, Constitution of the HSREC of the Faculty of Health Sciences.

For any questions or concerns, please feel free to contact HSREC Administration: 051-4017794/5 or email EthicsFHS@ufs.ac.za.

Thank you for submitting this proposal for ethical clearance and we wish you every success with your research.

APPENDIX B

DEPARTMENT OF HEALTH ETHICAL CLEARANCE LETTER



health

Department of
Health
FREE STATE PROVINCE

04 July 2022

Mrs Mpiki Tsoaeli
Psychology Department
University of Free State

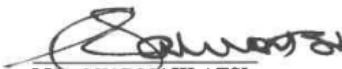
Dear Mrs M Tsoaeli

Subject: Self-regulation and coping as predictors of mental health concerns among primary healthcare nursing staff during the COVID-19 pandemic.

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

Trust you find the above in order.

Kind Regards


MR. MNG-MAHLATSI
HEAD: HEALTH

Date: 4/07/2022

Head: Health
PO Box 227, Bloemfontein, 9300
4th Floor, Executive Suite, Bophelo House, cnr Maitland and, Harvey Road, Bloemfontein
Tel: (051) 408 1646 Fax: (051) 408 1556 e-mail: khusemi@fshealth.gov.za / chikobvup@fshealth.gov.za

www.fs.gov.za

APPENDIX C**PARTICIPANT INFORMATION LEAFLET AND INFORMED CONSENT FORM**

RESEARCH STUDY INFORMATION LEAFLET AND CONSENT FORM

DATE

May, 2022

TITLE OF THE RESEARCH PROJECT

Self-regulation and coping as predictors of mental health concerns among primary healthcare nursing staff during the COVID-19 pandemic

PRINCIPLE INVESTIGATOR / RESEARCHER(S) NAME(S) AND CONTACT NUMBER(S):

Mrs Mpiki Agnes Tsoaeli 2020916702 0656592686

FACULTY AND DEPARTMENT:

*Faculty of Humanities
Psychology*

STUDYLEADER(S) NAME AND CONTACT NUMBER:

*Dr Carla Nel
051 401 3681*

WHAT IS THE AIM / PURPOSE OF THE STUDY?

This research project aims to better understand the degree to which current strategies for self-regulation and coping can explain the experience of anxiety, depression and stress among nurses who work in primary healthcare settings during COVID-19 pandemic. The study also aims to understand the role, if any, played age, gender and work experience.

WHO IS DOING THE RESEARCH?

The research is conducted by Mrs Mpiki Agnes Tsoaeli, with the support of the University of the Free State, towards fulfilment of the requirements for a Master's Degree in Psychology.

HAS THE STUDY RECEIVED ETHICAL APPROVAL?

This study has received approval from the Research Ethics Committee of UFS.

Approval number: HSD2022/0155/2607

Contact: Maricél van Rooyen, T: +27 51 401 9451, C: 083 406 0499, E: VanRooyenM2@ufs.ac.za

WHY ARE YOU INVITED TO TAKE PART IN THIS RESEARCH PROJECT?

You have been invited to participate as you are employed as a nursing staff at a public Primary Healthcare Clinic in the Lejweleputswa district, during the COVID-19 pandemic.

WHAT IS THE NATURE OF PARTICIPATION IN THIS STUDY?

This study involves the completion of a set of questionnaires. These questionnaires take an estimated 30 minutes to complete. Firstly, you will be asked some information about yourself, such as age, gender and work experience. Secondly, the Shortened Self-Regulation Questionnaire will be used to assess self-regulation. Thirdly, the Coping Orientations to Problems Experienced Questionnaire contains questions about your coping strategies. Lastly, the Depression Anxiety Stress Scale will ask you questions about your experience of stress, anxiety and feelings of depression. You can complete these questionnaires at a time and place most convenient to you and where you can do so privately. You will be given an envelope that can be sealed. Your sealed envelope can be submitted at a designated place in the clinic manager's office, from where the researcher will collect it. All COVID-19 restrictions and precautions will be adhered to at the study sites.

CAN THE PARTICIPANT WITHDRAW FROM THE STUDY?

Participation is voluntary and there is no penalty or loss of benefit for non-participation. You are under no obligation to consent to participate. If you do decide to take part, you will be asked to provide consent. You are free to withdraw your consent at any time and without giving a reason. However, it will no longer be possible to withdraw once the data has been processed.

WHAT ARE THE POTENTIAL BENEFITS OF TAKING PART IN THIS STUDY?

There are no direct benefits from participating in the study, but you will help researchers better understand the current experiences of frontline healthcare nurses.

WHAT IS THE ANTICIPATED INCONVENIENCE OF TAKING PART IN THIS STUDY?

The participants have no risk of physical harm. Apart from the time taken to complete the questionnaires, there is a possibility of psychological distress due to the emotional content of some questions. If you require emotional support, the researcher (contact number 0656592686) will help refer you to the available occupational health and employee wellness services within the Free State Department of Health. You can also contact additional available services if required, such as the South African Depression and Anxiety Group (SADAG 24-hour helplines: 0800 567 567 or 080 045 6789).

WILL WHAT I SAY BE KEPT CONFIDENTIAL?

Your name will not be recorded on any of the questionnaires and cannot, therefore, be connected to the answers that you give on the questionnaires. You can complete the questionnaires at any time or place that allows you to do so privately, and completed questionnaires are submitted in sealed envelopes.

HOW WILL THE INFORMATION BE STORED AND ULTIMATELY DESTROYED?

Hard copies of your answers will be stored securely for a period of five years with the supervisor at the Department of Psychology, University of the Free State. For future research or academic purposes, which will be subject to further Research Ethics Review and approval, all electronic information will be password-protected. The information obtained will be permanently destroyed after 5 years by shredding all documents and deleting all electronic information.

WILL I RECEIVE PAYMENT OR ANY INCENTIVES FOR PARTICIPATING IN THIS STUDY?

There will be no payment or rewards offered, financial or otherwise, for participating in this study. There are also no costs involved in participation.

HOW WILL THE PARTICIPANT BE INFORMED OF THE FINDINGS / RESULTS OF THE STUDY?

If you would like to be informed of the final research findings, please contact Mrs Agnes Mpiki Tsoaeli on 0656592686. Should you require any further information or want to contact the researcher about any aspect of this study, please contact Mrs Agnes Mpiki Tsoaeli on 0656592686. Should you have concerns about the way in which the research has been conducted, you may contact the study supervisor, Dr Carla Nel, at 0514013681 or nelc@ufs.ac.za.

Thank you for taking time to read this information sheet and for participating in this study.

CONSENT TO PARTICIPATE IN THIS STUDY

I, _____ (participant name), confirm that the person asking my consent to take part in this research has told me about the nature, procedure, potential benefits and anticipated inconvenience of participation.

I have read (or had explained to me) and understood the study as explained in the information sheet. I have had sufficient opportunity to ask questions and am prepared to participate in the study. I understand that my participation is voluntary and that I am free to withdraw at any time without penalty (if applicable). I am aware that the findings of this study will be anonymously processed into a research report, journal publications and/or conference proceedings.

I agree to the recording of the *insert specific data collection method*.

I have received a signed copy of the informed consent agreement.

Full Name of Participant: _____

Signature of Participant: _____ Date: _____

Full Name(s) of Researcher(s): _____

Signature of Researcher: _____ Date: _____

APPENDIX D
QUESTIONNAIRES

DEMOGRAPHIC QUESTIONNAIRE**AGE:** _____**GENDER:** Male ☐ Female ☐ Non-Binary ☐**WORK EXPERIENCE**

How many years have you been working in the field? _____

HEALTH HISTORYHave you ever tested POSITIVE for COVID-19? YES ☐ NO ☐Have you ever had to isolate because of exposure? YES ☐ NO ☐Have you ever tested for COVID-19 before? YES ☐ NO ☐Have you ever lost a close family member/colleague to COVID-19? YES ☐ NO ☐

Coping Orientations to the Problems Experienced Questionnaire

There are lots of ways to try to deal with stress. This questionnaire asks you to indicate what you generally do and feel, when you experience stressful events. Obviously, different events bring out somewhat different responses, but think about what you usually do when you are under a lot of stress. Then respond to each of the following items by ticking the box under one number on your answer sheet for each statement, using the response choices listed just below.

Choose your answers thoughtfully, and make your answers as true FOR YOU. Please answer every item. There are no "right" or "wrong" answers, so choose the most accurate answer for YOU--not what you think "most people" would say or do. Indicate what YOU usually do when YOU experience a stressful event.

	1	2	3	4
	I usually don't do this at all	I usually do this a little bit	I usually do this a medium amount	I usually do this a lot
1. I try to come up with a strategy about what to do				
2. I do what has to be done, one step at a time				
3. I think hard about what steps to take				
4. I think about how I might best handle the problem				
5. I learn something from the experience				
6. I take direct action to get around the problem				
7. I look for something good in what is happening				
8. I make a plan of action				
9. I try to see it in a different light, to make it seem more positive				

	1	2	3	4
	I usually don't do this at all	I usually do this a little bit	I usually do this a medium amount	I usually do this a lot
10. I make sure not to make matters worse by acting too soon				
11. I concentrate my efforts on doing something about it				
12. I try hard to prevent other things from interfering				
13. I accept the reality of the fact that it happened				
14. I try to grow as a person as a result of the experience				
15. I take additional action to try to get rid of the problem				
16. I restrain myself from doing anything too quickly				
17. I focus on dealing with this problem, and if necessary let other things slide for a while				
18. I get used to the idea that it happened				
19. I try to get emotional support from friends and relatives				
20. I feel emotional distress and express those feelings				
21. I discuss my feelings with someone				
22. I let my feelings out				
23. I get upset and let my emotions out				
24. I get sympathy and understanding from someone				
25. I try to get advice from someone about what to do				

	1	2	3	4
	I usually don't do this at all	I usually do this a little bit	I usually do this a medium amount	I usually do this a lot
26. I get upset, and am really aware of it				
27. I act as though it hasn't even happened				
28. I give up the attempt to get what I want				
29. I just give up trying to reach my goal				
30. I reduce the amount of effort I'm putting into solving				
31. I admit to myself that I can't deal with it and stop trying				
32. I daydream about things other than this				
33. I refuse to believe that it has happened				
34. I say to myself "this isn't real"				
35. I sleep more than usual				
36. I learn to live with it				
37. I put off doing anything until the situation permits				
38. I talk to someone to find out more about the situation				
39. I talk to someone who could do something concrete				
40. I ask people who have had similar experiences				
41. I go to the cinema or watch TV, to think about it less				

	1	2	3	4
	I usually don't do this at all	I usually do this a little bit	I usually do this a medium amount	I usually do this a lot
42. I force myself to wait for the right time to do something				
43. I turn to work or other activities to take my mind off				
44. I keep myself from getting distracted				
45. I seek God's help				
46. I accept that it has happened and that it can't be changed				
47. I put aside other activities in order to concentrate on this				

DASS21

Date:

Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you **over the past week**. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

- 0 Did not apply to me at all
- 1 Applied to me to some degree, or some of the time
- 2 Applied to me to a considerable degree or a good part of time
- 3 Applied to me very much or most of the time

1 (s)	I found it hard to wind down	0	1	2	3
2 (a)	I was aware of dryness of my mouth	0	1	2	3
3 (d)	I couldn't seem to experience any positive feeling at all	0	1	2	3
4 (a)	I experienced breathing difficulty (e.g. excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3
5 (d)	I found it difficult to work up the initiative to do things	0	1	2	3
6 (s)	I tended to over-react to situations	0	1	2	3
7 (a)	I experienced trembling (e.g. in the hands)	0	1	2	3
8 (s)	I felt that I was using a lot of nervous energy	0	1	2	3
9 (a)	I was worried about situations in which I might panic and make a fool of myself	0	1	2	3
10 (d)	I felt that I had nothing to look forward to	0	1	2	3
11 (s)	I found myself getting agitated	0	1	2	3
12 (s)	I found it difficult to relax	0	1	2	3
13 (d)	I felt down-hearted and blue	0	1	2	3
14 (s)	I was intolerant of anything that kept me from getting on with what I was doing	0	1	2	3
15 (a)	I felt I was close to panic	0	1	2	3
16 (d)	I was unable to become enthusiastic about anything	0	1	2	3
17 (d)	I felt I wasn't worth much as a person	0	1	2	3
18 (s)	I felt that I was rather touchy	0	1	2	3
19 (a)	I was aware of the action of my heart in the absence of physical exertion (e.g. sense of heart rate increase, heart missing a beat)	0	1	2	3
20 (a)	I felt scared without any good reason	0	1	2	3
21 (d)	I felt that life was meaningless	0	1	2	3

Short Form Self-Regulation Questionnaire (SSRQ)

Please answer the following questions by circling the response that best describes how you are. Remember, there are no right or wrong answers.

	Strongly Disagree	Disagree	Uncertain or Unsure	Agree	Strongly Agree
1. I usually keep track of my progress towards my goals.	1	2	3	4	5
2. I have trouble making up my mind about things.	1	2	3	4	5
3. I get easily distracted from my plans.	1	2	3	4	5
4. I don't notice the effects of my actions until it is too late.	1	2	3	4	5
5. I am able to accomplish goals I set for myself.	1	2	3	4	5
6. I put off making decisions.	1	2	3	4	5
7. It's hard for me to notice when I've "had enough" (alcohol, food, sweets).	1	2	3	4	5
8. If I wanted to change, I am confident that I could do it.	1	2	3	4	5
9. When it comes to deciding about a change, I feel overwhelmed by the choices.	1	2	3	4	5
10. I have trouble following through with things once I've made up my mind to do something.	1	2	3	4	5
11. I don't seem to learn from my mistakes.	1	2	3	4	5
12. I can stick to a plan that's working well.	1	2	3	4	5
13. I usually only have to make a mistake one time in order to learn from it.	1	2	3	4	5
14. I have personal standards, and try to live up to them.	1	2	3	4	5
15. As soon as I see a problem or challenge, I start looking for all possible solutions.	1	2	3	4	5
16. I have a hard time setting goals for myself.	1	2	3	4	5
17. I have a lot of willpower.	1	2	3	4	5
18. When I'm trying to change something, I pay a lot of attention to how I'm doing.	1	2	3	4	5
19. I have trouble making plans to help me reach my goals.	1	2	3	4	5
20. I am able to resist temptation.	1	2	3	4	5
21. I set goals for myself and keep track of my progress.	1	2	3	4	5
22. Most of the time I don't pay attention to what I'm doing.	1	2	3	4	5
23. I tend to keep doing the same thing, even when it doesn't work.	1	2	3	4	5
24. I can usually find several different possibilities when I want to change something.	1	2	3	4	5
25. Once I have a goal, I can usually plan how to reach it.	1	2	3	4	5
26. If I make a resolution to change something, I pay a lot of attention to how I'm doing.	1	2	3	4	5
27. Often I don't notice what I'm doing until someone calls it to my attention.	1	2	3	4	5
28. I usually think before I act.	1	2	3	4	5
29. I learn from my mistakes.	1	2	3	4	5
30. I know how I want to be.	1	2	3	4	5
31. I give up quickly.	1	2	3	4	5

APPENDIX E
SIMILARITY REPORT

SELF-REGULATION AND COPING AS PREDICTORS OF MENTAL HEALTH CONCERNS for turnitin.docx

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