THE PSYCHO-SOCIAL CHALLENGES OF WORKING AT THE FOREFRONT OF THE COVID-19 PANDEMIC: A SURVEY OF EMERGENCY CARE SERVICES PERSONNEL IN THE EASTERN CAPE EMS

A dissertation submitted in fulfillment of the requirements of the degree of Master of Health Sciences in Emergency Medical Care in the Faculty of Health Sciences Durban University of Technology

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ABSTRACT

Introduction

The COVID-19 pandemic, which emerged in early 2020, has caused a surge in patient numbers and crippled healthcare systems. South Africa has had more than 2.9 million positive COVID-19 cases, resulting in over 89 000 deaths. Healthcare workers (HCWs) have been under insurmountable mental and psychological pressure, leading to depression, anxiety and ultimately, burnout. Emergency Medical Services (EMS) personnel play a pivotal role in managing and caring for ill and injured patients in the pre-hospital setting. These practitioners are at the forefront of the fight against COVID-19. Despite the role they play in improving the health outcomes of these patients, there is a paucity of research on the effect of COVID-19 on EMS personnel working and living in the rural areas of low-and-middle-income countries like South Africa. Gaining insight into the daily challenges faced by HCWs and the coping strategies adopted will assist EMS personnel in mitigating physical and emotional stressors, as well as long-term psychological effects.

Aim of the study

To investigate the psycho-social influence of working at the forefront of the COVID-19 pandemic amongst EMS personnel in the Eastern Cape.

Objectives

This study aimed to:

I. Identify the working conditions that exacerbate the stress of working within the context of the COVID-19 pandemic;
II. Ascertain the factors that reduce stress amongst EMS personnel;
III. Identify the psychological stressors amongst EMS personnel in the Eastern Cape during the COVID-19 pandemic;
IV. Identify the coping mechanisms/strategies used by EMS personnel in the Eastern Cape during the COVID-19 pandemic; and
V. Make recommendations on providing support and improving the working conditions of EMS personnel in the Eastern Cape.

Methodology

The study was conducted using a quantitative, cross-sectional descriptive survey design guided by a post-positivist paradigm with a deductive approach. Data was collected from 368 participants who worked in the Eastern Cape during the start of the COVID-19 pandemic. Participants were presented with an online survey questionnaire, which was subsequently analysed using the Statistical Package for the Social Sciences (SPSS) statistics software, and the results were presented by tables, charts and descriptive summaries.

Results

An overwhelming 80.4% (n=296) of EMS personnel showed dedication to their work (patient care), despite working under immense pressure. The findings showed moderate agreement to different stressors, indicating that EMS personnel do not suffer from existential fears but are somewhat worried about their own risk of infection and that of their family. The main stress factors included the availability of PPE, infection and treatment protocols, recognition of their work by EMS management, and the perceived risk of infection to themselves and others. Motivational factors that encourage EMS personnel to work in future outbreaks or pandemics were not significantly related to attitudes within the context of the COVID-19 pandemic.

Conclusion

As a direct and immediate consequence of providing care to COVID-19-infected patients, frontline HCWs put themselves at risk of various adverse physical and emotional effects. An already stressful situation becomes extremely precarious as a result of the escalating negative impacts on mental and physical health experienced by EMS personnel, a crucial demographic, used to fight the pandemic. The findings of this study are consistent with what was already known from previous studies conducted on HCWs during previous pandemics, thereby being relatively predictable. This emphasizes the importance of basing pandemic planning and reactions on the most current and reliable data.

DECLARATION

I, Patrick Mfanafuthi Mavuso, declare that:

1. The research reported in this dissertation, except where otherwise indicated, is my original research.
2. This dissertation has not been submitted for any degree or examination at any other university.
3. This dissertation does not contain other persons' data, pictures, graphs or other information unless specifically acknowledged as being sourced from other people.
4. This dissertation does not contain other persons' writing unless specifically acknowledged as being sourced from other researchers. Where other written sources have been quoted, then:
    a. Their words have been re-phrased, and the general information attributed to them has been referenced.
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5. This dissertation does not contain text, graphics or tables copied and pasted from the Internet unless specifically acknowledged, and the source is detailed in the dissertation and the References sections.

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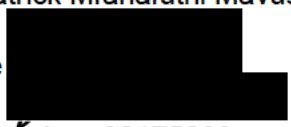
Signature 

Student number: 22175066

DEDICATION

I would like to dedicate this dissertation to my family:

- To my parents, I love you both and appreciate everything that you have done for me. To my mom, thank you for always supporting my choices and encouraging me to keep pushing through, no matter the hardship.
- To my late brother, Sizwe Mavuso, you taught me perseverance and humility, I am forever grateful to have had you in my life.
- To my late sister, Sibonelo Mavuso, you've always inspired me to live life to the fullest and to fight for what I want. Thank you for being my guardian angel throughout this journey.
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LIST OF ABBREVIATIONS

ALS:	Advanced Life Support
BLS:	Basic Life Support
COVID-19:	Novel Coronavirus Disease 2019
CI:	Confidence Interval
EC:	Eastern Cape
EMS:	Emergency Medical Services
HCWs:	Healthcare Workers
HIC:	High-Income Country
HPCSA:	Health Professions Council of South Africa
ILS:	Intermediate Life Support
LMIC:	Low-Middle-Income Country
MERS:	Middle East Respiratory Syndrome
NIDS:	National Income Dynamic Study
PPE:	Personal Protective Equipment
PTSD:	Post-Traumatic Stress Disorder
SA:	South Africa
SARS:	Severe Acute Respiratory Syndrome
SPSS:	Statistical Package for the Social Sciences
WHO:	World Health Organization

GLOSSARY OF TERMS

Advanced Life Support (ALS) practitioner: An emergency care provider registered as a paramedic or ECP Emergency Care Practitioner (ECP) who has completed a 4 Year Degree or B-Tech with the Professional Board of Emergency Care of the Health Professions Council of South Africa (HPCSA). ALS practitioners are able to render an advanced level of pre-hospital and inter-hospital emergency care and non-emergency medical services that includes basic life support functions, cardiac monitoring, cardiac defibrillation, electrocardiography, intravenous therapy, administration of medications, drugs and solutions, use of adjunctive medical devices, trauma care, and other authorized techniques and procedures (Health Professions Council of South Africa, 2011).

Basic Ambulance Assistance (BLS) practitioner: An emergency care provider registered as a BLS with the Professional Board of Emergency Care of the Health Professions Council of South Africa (HPCSA). BLSs provide the most basic level of pre-hospital emergency care. Their training comprises a four to six-week training course that includes cardiopulmonary resuscitation, first aid, use of ambulance equipment, patient packaging and trauma management (MacFarlane *et al.* 2004). According to Tiwari *et al.* (2021: 2), the Health Professions Council of South Africa (HPCSA) registrations for the following four categories have been closed: Basic Ambulance Assistant (BAA), Ambulance Emergency Assistant (AEA), Emergency Care Technician (ECT) and Paramedic (ANT).

Emergency Medical Services: A comprehensive system that provides the arrangements of personnel, facilities and equipment for the effective, coordinated and timely delivery of health and safety services to victims of sudden illness or injury (Al-Shaqsi, 2010: 320). Once it is activated by an incident that causes serious illness or injury, the focus of EMS is the emergency medical care of the patient(s).

Health System: All the activities whose primary purpose is to promote, restore or maintain health (WHO, 2009).

Healthcare worker (HCW): Anyone who works in a healthcare or social care setting, including healthcare students on clinical placement, frontline healthcare workers and other healthcare workers not in direct patient contact (HPSC, 2021).

In-hospital care: Medical treatment provided in a hospital for patients of various age groups and with varying injuries or diseases (WHO, 2009).

Intermediate Life Support (ILS) practitioner: An emergency care provider registered as an Ambulance Emergency Assistant (AEA) with the Professional Board of Emergency Care of the Health Professions Council of South Africa (HPCSA). AEAs undergo a three-to-four-month training programme after completing the four-week Basic Ambulance Assistant course and several months on the road experience. ILS can provide nebulization, peripheral intravenous access, basic airway management, administration of glucose, aspirin and manual defibrillation in cardiac arrest (Health Professions Council of South Africa, 2011). This has been discontinued as mentioned above.

Pandemic: An epidemic occurring worldwide, or over a very wide area, crossing international boundaries and usually affecting a large number of people (Last, 2001: 131).

Pre-hospital care: Emergency medical care rendered in the out-of-hospital setting. EMS provides access to the healthcare system by providing for those requiring immediate or emergency care (Wilson *et al.* 2015)

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CHAPTER 1

CONTEXTUALIZING THE STUDY

1.1 Introduction

In December 2019, the Chinese health authorities reported the presence of new cases of atypical pneumonia of non-identified etiology in Wuhan, China (Huang *et al*. 2020: 478). As the novel coronavirus (COVID-19) keeps spreading, healthcare workers (HCWs) around the globe are presented with an unprecedented situation of making difficult decisions and working under immense pressure. In almost all countries, COVID-19 and its associated problems have severely affected global health, especially in middle- and low-income countries with limited resources, such as many African countries (Hatefi *et al.* 2021: 1). According to Hatefi *et al.* (2021: 1), the African continent has had previous pandemic disease outbreaks where contagious diseases, such as Ebola and HIV, are continuing to spread. These pandemics still exert strain on an already weakened public healthcare system as a result of low medical resources, bad health management systems, and limited financial means.

The colossal impact of the COVID-19 pandemic was noted by the mere surge in the number of patients in healthcare facilities. As the number of cases surged, so did the pressure on healthcare facilities and on the HCWs that operated within them. In addition to the pressures, the large-scale shortage of PPE required by HCWs to safely perform their duties has compounded the list of issues (Chersich, 2020). Literature exists regarding the effect of COVID-19 on HCWs, especially those working within healthcare facilities. However, there is little or no research regarding the impact of COVID-19 on pre-hospital (out-of-hospital) emergency medical services personnel. A recent assessment of African Emergency Medical Services (EMS) by Mould- Millman *et al.* (2017: 2) provided substantial evidence on the relative paucity of EMS systems on more than half the Africa continent. The assessment notes the inadequacies to meet the demand of the populations' acute care needs, and that is only for countries where EMS systems do exist (Mould-Millman *et al.* 2017: 2).

Emergency Medical Services (EMS) are designed to provide pre-hospital Emergency Medical Care (EMC) and the transportation of critically ill and injured patients to the most appropriate hospital (Spaite *et al.* 1995: 147). EMS personnel are commonly the first healthcare providers to establish contact with patients suspected of infectious diseases (i.e., COVID-19). This study is

therefore aimed at assessing the psycho-social factors impacting EMS personnel emanating from working at the frontline of the COVID-19 pandemic. The study followed a quantitative approach and used a cross-sectional descriptive design, as the researcher attempted to gain insights into the challenges faced by EMS personnel working in the Eastern Cape, with reference to identifying the coping mechanisms that they have adopted. A sample of 357 Emergency Medical Services personnel rendering emergency medical care in the Eastern Cape Province participated in this study.

1.2 Background to the study

Worldwide, healthcare systems have been frantically maximizing efforts to manage their resources to mitigate the spread and reduce morbidity from the Novel Coronavirus Disease 2019 (COVID-19). At the frontline of this global crisis are HCWs, who have the task of diagnosing and treating an exponentially growing number of acutely ill patients, often having to make critical decisions under physical and psychological pressure. While HCWs in most countries represent less than 3% of the population (WHO, 2021a), it was suggested that the proportion of COVID-19 infections amongst HCWs is far greater than those noted amongst the general population. In addition to physical risk, increased workload and demanding work hours, the prevalence of burnout amongst HCWs has drastically increased (WHO, 2020; Fernandez, 2021: 2). In addition, HCWs live in fear of contracting the virus or infecting their families. It is evident that the influence of COVID-19 on HCWs has not only affected their personal lives, but also their social lives (WHO, 2020).

The unprecedented transmission rate of COVID-19 has brought significant challenges for global healthcare systems, especially those in low-and-middle-income countries (LMICs). When compared to high-income countries (HIC), LMICs are already challenged with over-burdened healthcare systems, limited resources and a poor reporting system (WHO, 2020). EMS personnel play a pivotal role in managing and caring for ill and injured patients in the pre-hospital setting and are at the forefront of the fight against COVID-19. Despite their importance to improved health outcomes, EMS remains a neglected area of research (Mould-Millman *et al.* 2017:2).

Karim (2020: 3) describes South Africa's national response to COVID-19 as "sailing a ship while building it". This illustrates that the pandemic caught everyone unaware, and it has been a reactive process since. As a result, HCWs who are at the forefront of dealing with the pandemic are expected to respond under challenging conditions. The country's high burden of disease, like in many other LMICs, is exacerbated by the shortage of workforce, predominately due to the

migration of HCWs from low-and-middle-income countries to developed countries. The nature of the COVID-19 pandemic has implicated critical care nursing, rapidly increasing the need for intensive-care beds and specialists, which is a major concern for resource-limited countries. As a result of these factors, low-and-middle-income countries like South Africa are extremely vulnerable to the current pandemic. The pandemic has invigorated the need for a renewed focus on public health capacities, particularly in low-and-middle-income countries.

In an explanatory study on the effect of COVID-19, Mbunge (2020: 1813) reported that the South African health system is affected by a lack of personal protective equipment (PPE), increased mortality rates, mental health problems, substance abuse, and the resurgent of non-communicable diseases. The shortage of resources, overworked HCWs and an ineffective support system have further eroded healthcare delivery and threatened the well-being of South African HCWs. Nearly a year into the Pandemic, South Africa has reported 6 364 HCWs who were admitted due to COVID-19 infections (NICD, 2021). Six months later, there were 35 145 confirmed COVID-19 cases amongst the state healthcare community, and a total of 339 healthcare workers died in hospitals between March and November 2020 according to the Health Minister's report (Times Live, 2021). Most of these deaths in South Africa occurred in the Eastern Cape, KwaZulu-Natal and Gauteng (Times Live, 2021). While the exact figures for HCWs within public healthcare facilities are unknown, Rees *et al.* (2021: 311) suggested that HCWs at private healthcare facilities are reported to have a 14% infection rate. While these statistics are useful, they are likely to under-report the magnitude of this problem in South Africa as the public healthcare sector, which makes up almost 70% of the South African healthcare sector, has been excluded.

The COVID-19 pandemic has had a significant global impact; hence it is not surprising that a wealth of research is now being published on its effect on HCWs. However, very little is known about the impact and the aftermath that LMICs must deal with. Moreover, most of the studies are conducted in urban settings and neglect HWCs living and working in rural settings. To the researcher's knowledge, this is the first study to explore the effects of COVID-19 on EMS personnel in a rural region of South Africa.

1.3 Problem statement

The COVID-19 pandemic has devastated healthcare systems worldwide (Sun *et al.* 2021: 1). Before the pandemic, the South African healthcare system was already over-burdened and under-resourced, and the pandemic has simply exacerbated this situation. EMS personnel are at the

forefront of the fight against this pandemic and are at higher risk of contracting and spreading COVID-19. In fact, many HCWs in LMICs have been infected and quarantined, while others have died due to exposure to the COVID-19 pandemic. The WHO estimates that between 80 000 and 180 000 healthcare workers have died from COVID-19 in the period between January 2020 to May 2021 (WHO, 2021b). In South Africa, over 40 000 healthcare workers have contracted COVID-19. Of these, 6 473 have been hospitalized and 663 have passed on (Department of Health, 2021).

In the aftermath of the first 2 years of the pandemic, global HCWs are expressing psychological difficulties, including anxiety, depression, fear, distress, poor coping mechanisms and insomnia amongst others (Robertson *et al.* 2020; Shaukat, *et al.* 2020). Many of them claim to feel overwhelmed by the caseloads, working conditions and the shortage of vital PPE (Feroz *et al.* 2020: 10). It is evident that as the virus continues to mutate and cause a resurgence in the number of patients, many frontline HCWs continue to burnout. It is therefore imperative that one attempts to understand the psycho-social influences on frontline HCWs and help mitigate physical and mental illness, including burnout. Furthermore, no studies have explored the impact of this phenomenon on EMS personnel, let alone HCWs from the rural regions of South Africa.

1.4 The aim of the study

To investigate the psycho-social influence of working at the forefront of the COVID-19 pandemic amongst EMS personnel in the Eastern Cape.

1.5 Study objectives

- To conduct an investigative study into the psycho-social influences caused by the COVID-19 pandemic on frontline healthcare workers in the Eastern Cape;
- To identify the working conditions that exacerbate the stress of working within the context of the COVID-19 pandemic;
- To identify the factors that reduce stress amongst EMS personnel;
- To identify the psychological stressors amongst EMS personnel during the COVID-19 pandemic in the Eastern Cape;
- To identify the coping mechanisms/strategies used by EMS personnel in the Eastern Cape during the COVID-19 pandemic; and
- To make recommendations on providing support and improving the working conditions of EMS personnel in the Eastern Cape.

1.6 Significance of the study

This study was undertaken to assess the psycho-social influences of the COVID-19 pandemic on EMS personnel, with the intention to contribute to the well-being and safety of frontline healthcare workers during and after the pandemic.

The insights and findings of this study can aid in understanding how EMS personnel mitigate physical and emotional stressors, as well as burnout. Additionally, the study intends to contribute to the body of knowledge and the development of future EMS-specific response guidelines for South African systems, which may well prove useful for other low-and-middle-income countries in Africa. It is particularly important given the paucity of research being done related to this category of HCWs in South Africa.

1.7 Research gap

A wealth of literature is now being published on the impact of COVID-19 on HCWs. However, in the context of low-and-middle-income countries like South Africa, not much research has been conducted on the psycho-social challenges of the COVID-19 pandemic on EMS personnel in South Africa, particularly in the Eastern Cape.

1.8 Chapter Summary

This chapter introduced the study and provided an overview of the study's aim, objectives and significance, as well as the research gap. The next chapter contains a review of extant literature describing the challenges faced by frontline healthcare workers due to COVID-19 in order to provide an understanding of the context of the study.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Chapter Two provides an overview of the literature related to the phenomenon under investigation. It explores both the theoretical and empirical work in the related field in order to give diverse perspectives on the topic under study. Maggio *et al.* (2016: 297) defined a literature review as a synthetic review and summary of what is known and unknown about the topic from within the existing knowledge. The review of the literature presented in this chapter is a vital component to this research as it provides the foundation for the researcher's perspective on the subject matter.

This chapter provides a brief overview of the psycho-social challenges faced by frontline healthcare workers due to the COVID-19 pandemic. The key themes that emerged in this literature review included stress and anxiety, fear of infection, burnout and suicide, and the lack of personal protective equipment. This chapter will also explore the various coping mechanisms employed by frontline HCWs during the COVID-19 pandemic. The literature regarding these topics was explored using several databases through the Durban University of Technology's library. The databases employed in the retrieval of research articles were PubMed, Google Search, Medline, Research Gate, Science Direct and Elsevier. Other search engines such as Google/Google Scholar were also used to retrieve publications, news and illustrations.

2.2 The COVID-19 pandemic and response strategies

The COVID-19 pandemic, also referred to as the coronavirus pandemic, was first reported in Wuhan, China in December 2019. Subsequently, it was confirmed that the causal pathogenic agent was a new Beta coronavirus (RNA), which shared phylogenetic similarities with SARS-CoV-1, resulting in it thus being called SARS-CoV-2 (Soto-Cámara, 2021: 1; Cucinotta and Vanelli, 2020: 158). Two years later, the virus has infected more than 500 million people in almost 193 countries and killed more than six million people worldwide, and it is not yet over (WHO, 2022). A global effort was seen to develop a vaccine and as of April 2022, more than 500 million COVID-19 vaccines had been administered worldwide (CDC, 2022). However, there have been growing concerns amongst the scientific community as more and more sub-variants of the SARS-Cov-2 emerge. These variants have demonstrated increased transmissibility, with further research being

required to understand how certain viral mutations affect the severity of illness (Harvey *et al.* 2021: 410).

The spread of the virus resulted in the worldwide implementation of travel restrictions, lockdowns, quarantines, workplace hazard controls and business closures. To contain the spread of COVID-19, which has become not just a public health issue but also a social and economic problem, the Centre for Disease Control and Prevention (2019) has since developed a strategy for the global response to COVID-19 (2020-2023) with goals to:

- Limit the transmission of COVID-19;
- Minimize the influence of COVID-19 on vulnerable populations;
- Reduce specific health threats that pose a current and future risk;
- Increase the scientific knowledge about SARS-CoV-2 (the virus responsible for COVID-19) and provide global public health leadership; and
- Support the development of long-term health security in low-middle-income countries.

These efforts have been adopted globally to varying degrees. It was initially suggested that high-income countries (HICs) would be "hit" the hardest by the pandemic as opposed to low-and-middle-income countries (Bandyopadhyay *et al.* 2020: 98). However, based on the recent trends and statistics from February and March 2021, low-middle-income countries (LMICs) accounted for 10% of the new COVID-19 variant, with this figure escalating to 40% by May 2021, marking the first time that LMICs had a higher proportion of COVID-related deaths than HICs (OCHA, 2021). Evidently, the virus presented a challenge for LMICs whose healthcare systems were already under immerse pressure before the pandemic started.

Despite this discrepancy between infections and deaths in HICs and those in LMICs, the response strategies have been similar across the globe with social distancing, the wearing of masks, sanitizing and vaccination being ubiquitously adopted. Whilst a one-size-fits-all response has been adopted, LMICs are a unique context with unique challenges that need to be acknowledged. The burden suffered by African countries, including those in LMICs, is different when compared to HICs in Europe or China due to demographic, epidemiological, environmental and socio-economic factors (Zandvoort *et al.* 2020: 3). In LMICs, the lockdown strategy was implemented to decrease the rate of the COVID-19 outbreak (Hatefi *et al.* 2020:159). Whilst this strategy might have worked to prevent the spread of the virus, the unintended consequences included the loss of employment, loss of livelihood, hunger and perpetuated poverty. According to a National Income Dynamics Study (NIDS), Coronavirus Rapid Mobile Survey (CRAM), two of every five

adults reported that their household lost its main source of income when lockdown measures were implemented in South Africa (Lawn *et al.* 2020: 1).

South Africa's COVID-19 response comprised multiple overlapping stages implemented as part of the COVID-19 Risk Adjustment strategy. The initial stages made it difficult for people to get tested, with the private sector conducting approximately 80% of the tests (Mbunge, 2020: 1812). Karim (2020: 3) described South Africa's national response to COVID-19 as "sailing a ship while building it". This illustrated that the pandemic caught everyone unaware, and it has been a reactive process since. As a result, HCWs who are at the forefront of dealing with the pandemic were expected to respond under challenging conditions. The country's high burden of disease, as in many other low-and-middle-income countries, is exacerbated by the shortage of workforce, predominantly due to the migration of HCWs from low-and-middle-income countries to developed countries. The nature of the COVID-19 pandemic has implicated critical care nursing, rapidly increasing the need for intensive-care beds and specialists, which is a major concern for resource-limited countries. As a result of these factors, LMICs like South Africa were extremely vulnerable to the current pandemic. The pandemic has invigorated the need for a renewed focus on public health capacities, particularly in LMICs. The self-isolation measures accompanying this pandemic have highlighted significant mental health concerns related to individuals restricting physical contact, social activities, religious services and other traditional methods of emotional connection (Usher *et al.* 2020: 1809; Bender *et al.* 2020: 455).

The Eastern Cape is located on South Africa's eastern coast and accommodates the third largest population in the country (Polity, 2012). In December 2020, the Eastern Cape Province was considered a hot-spot for the COVID-19 pandemic due to its high infection and death rates. According to Bradshaw *et al.* (2022: 6), the Eastern Cape Province had the second-highest number of recorded COVID-19-related deaths between 28 March and 18 July 2020 (Bradshaw, 2020). This undoubtedly strained the healthcare system and HCWs within the province. Due to the nature of rural areas, EMS providers may need to travel farther or navigate difficult terrain when responding to an emergency or transporting a patient to the hospital. Furthermore, adverse weather conditions, when combined with longer distances and geographical obstacles, can significantly affect response or transport times. Additionally, transport time is critical for patients whose illnesses and injuries are so severe that their needs cannot be met in the nearest rural hospital (Minhas *et al.* 2017: 93). This undoubtedly puts much strain on EMS personnel who have to travel unsafe and longer distances to the patient and then transport them to definitive care.

Challenges with access to healthcare centers, scarcity of resources and long travel distances are part of the reason that the Eastern Cape Province was chosen as the study setting.

2.3 Emergency Medical Services in South Africa

Emergency Medical Services (EMS) refers to “a comprehensive system that provides personnel, facilities and equipment arrangements for the practical, coordinated and prompt delivery of health and safety services to victims of sudden illness or injury” (Al-Shaqsi, 2010: 320). The goal of EMS is to provide victims of unexpected and life-threatening injuries or emergencies with care in a timely manner in order to minimize premature deaths and morbidities of a long-term nature. During the pandemic, EMS care and transport posed unique challenges due to the nature of the setting, enclosed space during transport, frequent need for rapid medical decision-making, and interventions with limited information. As a result of the nature of their work, EMS personnel were exposed to traumatic events, long working hours and a hazardous work environment.

According to Mould-Millman (2017: 7), emergency medical services (EMS) systems only exist in one-third of African countries. In South Africa, EMS is regulated by the National Health Act and the health service structure is managed and implemented at the ground level. Pre-hospital emergency care is provided by EMS personnel throughout the country. In South Africa, EMS has evolved over time to reflect a change from a simple system of ambulances providing only basic transportation to those that request it, to a system in which professionally trained medical personnel will treat and stabilize patients on scene and transport them to the appropriate medical facility (Al-Shaqsi, 2010: 321-322).

Despite this development, there remains inequitable service distribution, with many rural areas being under-served. Tiwari *et al.* (2021: 18) stated that emergency care is designed to overcome the factors most commonly implicated with preventable mortality, such as postponements in seeking care, access to a health facility and the provision of adequate care at the facility (Tiwari *et al.* 2021: 8). In South Africa, pre-hospital care is provided through a blended public and privately funded EMS model. However, most of the South African population access public sector services (84%), whilst the private sector serves 16% of the population (Naidoo, 2012: 149). Therefore, a vast majority of South Africans rely only on government EMS as they cannot afford to pay private medical providers.

Prior to 2018, the South African EMS delivery systems were based on a three-tiered system, namely Basic Life Support (BLS), Intermediate Life support (ILS) and Advanced Life Support (ALS) qualifications. However, these were all not aligned with the national qualifications

framework (NQF) of South Africa. With effect from February 2018, all non-NQF aligned courses were discontinued (Sobuwa and Christopher, 2019: 2). At present, the South African EMS system is still based on a three-tiered system. However, the entry-level qualification is a Higher Certificate in Emergency Care Assistant (ECA), followed by a Diploma in Emergency Care Technician (ECT) and finally, the Emergency Care Practitioner (ECP). Each level is licensed for independent practice and governed by a national registration board, yet delivered primarily through provincial state-funded EMS, with several private EMS located in the larger cities across the country servicing medical insurance clients (Howard *et al.* 2020:2).

2.4 Psychological challenges faced by EMS personnel before the COVID-19 pandemic

A systematic review of 27 international studies reported on 30 878 ambulance personnel and found the estimated prevalence rates of 11% for post-traumatic stress (PTS), 15% for depression, 15% for anxiety, and 27% for general psychological distress amongst ambulance personnel (Petrie *et al.* 2018: 892). A broader Canadian study conducted by Carleton *et al.* (2017: 60-62) on emergency response and correctional workers (5813 correctional workers, dispatchers, firefighters, paramedics and police officers) showed that 44.5% screened positive for clinically significant symptoms of one or more diagnosable mental disorders. This is approximately four times higher than diagnosed rates for the general population at 10.1%, and these rates were noted to be higher than earlier studies and suggested the rate of anxiety amongst paramedics to be as high as 22%, with depression and suicidal ideation both at 10% (Lawn *et al.* 2020: 2). Aside from psychological effects, the nature of ambulance work and exposure to occupational hazards have a variety of physical consequences. These include headaches, sleep disruption, muscular skeletal injuries, fatigue, dietary problems, weight gain and, in some cases, exposure to dangerous pathogens (Lawn *et al.* 2020: 2).

Due to the nature of their work, EMS personnel are faced with nervous and worried patients or their relatives. This is a serious occupational health problem that has been suggested to result in psychological, physical, social and organizational consequences (Blando *et al.* 2009: 330; Vento *et al.* 2020: 3; Vagni *et al.* 2020: 1). Studies have shown that EMS providers face even greater psychological issues due to disaster response without receiving the necessary psychological assistance. A longitudinal study conducted after the 2017 Taiwan earthquake amongst 37 EMS providers suggested that 19 EMS providers (51.3%) reported post-traumatic stress disorder (PTSD) symptoms after 1 month, with 13 of those reporting PTSD symptoms at a 6-month follow-

up (Hsiao *et al.* 2016: 4). The authors of the study claim that mental health issues related to disaster response might arise right after a disaster and last for months or even years if not addressed. This was also found in a study by Smith and Burkle (2019: 56) where a group of EMS providers were still experiencing feelings of guilt, anxiety and nightmares 15 years after responding to the 9/11 even, in the United States of America. More significantly, the study reveals that PTSD is linked to a lack of awareness about the potential psychological obstacles of responding to disasters.

EMS personnel in South Africa are exposed to a high number of traumatic incidents. Furthermore, they work long shifts and do not have the social support necessary to promote bio-psychosocial well-being. The Bio-psychosocial model was first conceptualized by George Engel in 1977, suggesting that in order to understand a person's medical condition, it is not simply the biological factors that should be considered, but also the psychological and social factors (Gatchel *et al.* 2007: 582). EMS personnel in South Africa experience high levels of stress since they attend gruesome scenes; experience extreme pressure to save lives; and sometimes attend a scene where a child or a colleague is involved (Zana 2019: 13). A study by Minnie *et al.* (2015: 15) suggested that the nature of their highly stressful work environment often results in PTSD amongst EMS personnel. The high prevalence may be caused by people being exposed to traumatic events, motor vehicle accidents, criminal violence (murders, rape and assaults), suicide cases and illness exacerbated by extreme poverty (Atwoli *et al.* 2013). Furthermore, the occupational stress of EMS personnel may be increased by the lack of job resources. Correlations obtained in a study by Naudé and Rothmann (2006: 75) showed that EMS personnel in the Gauteng Province of South Africa experienced stress because of job demands (e.g., working overtime, assignment of new or unfamiliar duties, dealing with crisis situations and assignment of increased responsibility). Moreover, emotional exhaustion and de-personalization were also found to be prevalent. The possible explanation for the results could have been a severe lack of resources. A few years later and in terms of the impact of the current pandemic, EMS personnel in South Africa may be on the verge of physical and emotional exhaustion. Furthermore, a recent study by Visagie *et al.* (2021: 11) regarding PSTD amongst EMS personnel in the Eastern Cape identified that out of 68 respondents, 41 (60.3%) showed symptoms of PTSD and could possibly be diagnosed with PTSD. Therefore, the current study aimed at investigating the common stressors experienced by EMS personnel during the COVID-19 pandemic may be a necessity to highlight any new or ongoing stressors that may be caused by the pandemic in the acute and prolonged phases.

2.5 Healthcare workers in the wake of COVID-19

The WHO (2020) defined healthcare workers as 'all people engaged in actions whose primary intent is to enhance health' and are currently the most treasured national resource during a disaster/pandemic. Kelly (2011: 540) defined a pandemic as "an epidemic occurring worldwide, or over a very wide area, crossing international boundaries and usually affecting a large number of people". Throughout the course of history, numerous pandemics have been mentioned, for which strategies such as quarantine and cross-border control helped curb the spread, with the last pandemic being in 2009. Nearly a decade later, governments have once again adopted the same restrictive measures to contain the spread of COVID-19. In an effort to minimize the impact of the pandemic on global health systems, world leaders have resorted to forcing people to social distance and isolate themselves (Wells *et al.* 2021; 7504). For this reason, the global outbreak still has important repercussions not only on physical health: but also, psychological well-being, which has been severely impacted considering that during the pandemic period, the risk of the mental disorder onset also increased.

2.5.1 Mental and physical health of HCWs during the pandemic

A crucial consequence of this pandemic has been the effect on HCWs' mental and physical health. Emergencies such as the COVID-19 outbreak can prove riskier for HCWs who work under various difficulties and risks, even in the provision of ordinary health services (Çelmeçe and Menekay, 2020: 2). The WHO (2021) defines health as a state of complete physical, mental and social well-being and not merely the absences of disease or infirmity, creating the phrase "there is no health without mental health". The high mortality rate, high disease transmission capacity, and the shortcomings of health systems have had a significant effect on employees' mental health, and these effects are ongoing (Brooks, 2020: 912). Furthermore, Çelmeçe and Menekay (2020: 2) warn that if the appropriate actions to protect HCWs are not taken, they will exhibit high levels of burnout associated with depressive symptoms, anxiety, suicidal ideation, and substance abuse. In this regard, Sim (2020: 281) argues that a physically healthy, mentally healthy and well-equipped workforce is key to a country's ability to manage COVID-19 cases effectively, and that lessons can be learnt from the pandemic.

In a systemic review of the experiences of HCW support during COVID-19 and previous pandemics, the following themes were prominent (Billings *et al.* 2021: 5-12):

- Physical health, safety and security:
    - Concern for self, concern for others, practical and environmental issues.

- Workload:
    - Issues in the setting they work in.
- Increased working hours and weekend shifts:
    - Additional time taken to wear PPE and increased paperwork.
- Stigma:
    - Highlighted as severe early during the pandemic as little was known about the virus.
- Ethical, moral and professional dilemmas:
    - One of the greatest sources of tension was the competing obligation healthcare workers felt between providing good patient care and protecting their own physical safety.
- Personal and professional growth:
    - Many healthcare workers described aspects of the work as enjoyable and rewarding and appeared to derive job satisfaction from work that they felt was “important” and “meaningful”.
- Family and friends:
    - Families and friends were important sources of support but could place pressure on the healthcare workers as they also feared they might contract the disease from them.

The results of the review highlighted multiple triggers of stress, including protective factors. However, out of 46 studies included in the meta-synthesis, only 12 studies were from Africa (Billings *et al.* 2021: 5-12). All the studies were related to Ebola, and none were related to COVID-19. Therefore, more research needs to be conducted in the African setting in order to fully understand the impact of COVID-19 on HCWs.

Some common themes had also emerged amongst other studies focusing on the psychological influence of COVID-19 on HCWs. These were further supported by a South African study on 159 HCWs, concluding that the prevalence of stress, anxiety and depression were similar amongst all categories of staff (Hoque *et al.* 2021: 4). However, some studies have contrasting sub-factors, including an unrepresented population of HCWs living and working in the rural setting, highlighted as a limitation in two other studies (Ardebili *et al.* 2020: 551; Feroz *et al.* 2020: 11). This emphasised the need for research, not only in a rural setting, but also in HCWs working in a different environment (e.g., pre-hospital setting). The findings of these studies also suggest that the psychological implications for HCWs are variable, as a majority of these studies demonstrate

an increased risk of acquiring trauma or stress-related disorders, depression and anxiety, thus highlighting the urgent need to provide interventions that address and improve the mental health of HCWs. According to Cabarkap (2020: 1-2), coping strategies varied amongst the contrasting socio-cultural settings and appeared to differ amongst doctors, nurses and other HCWs. This was reasonably to be expected as the nature of working in an ambulance versus working inside a hospital may have different psychological influences amongst HCWs. The ability of HCWs to adequately cope with stressors is important, not just for the sake of the patients, but for their families and themselves.

2.5.2 Mental and physical health of EMS personnel during the pandemic

The influence of COVID-19 on healthcare workers has been the focus of recent research, with most studies focusing on the experiences and well-being of HCWs. While Emergency Medical Services (EMS) personnel are usually at the forefront of any national disaster or pandemic, there is limited extant research highlighting their experiences and well-being, especially during the current pandemic. In addition, it is possible that when EMS personnel establish first contact with patients, they (patients) may have not yet been diagnosed, posing a significant risk of transmission to EMS personnel. In the study, Silverman *et al.* (2004: 1689) concluded that the experiences and the psychological influence of EMS personnel are poorly documented and reported on. A study by Ardebili *et al.* (2021: 547-559) on healthcare providers' experiences of working during the COVID-19 pandemic included EMS personnel amongst doctors and nurses. However, saturation was inadequate, with 8 out of 44 participants being EMS personnel. Other similar articles did not include EMS personnel, or the sample size was poor. Most studies that investigated the effect of COVID-19 on HCWs and included EMS personnel in their sample size did not include the effects of the different environmental factors that EMS personnel face when compared to other HCWs. Walton *et al.* (2020: 242) assert that specific stressors that workers are facing during the COVID-19 emergency are related to the organizational context. As highlighted above, EMS personnel are commonly camouflaged with other related HCWs, failing to assess the influence of their specific work-setting, which is different from other allied HCWs. The following sections will highlight the most common themes that emerged amongst studies focusing on the effects of COVID-19 on HCWs.

2.6 Psychological challenges faced by HCWs during the COVID-19 pandemic

Healthcare workers are categorized amongst the vulnerable populations during a pandemic, as they interact with different people while discharging their duties (Rossi *et al.* 2020: 4). These workers provide emergency medical care, placing them at the forefront of any local or national disaster. As the novel virus keeps spreading, HCWs worldwide are faced with an unprecedented situation of having to make difficult decisions and work under extreme pressure (Gunnell, 2020: 470). Numerous studies conducted on Chinese HCWs have highlighted the impact of the pandemic on the psychological health of doctors and nurses. Some studies have found that healthcare workers have high levels of anxiety, depression, insomnia and distress (Lai *et al.* 2020: 4; Li *et al.* 2020: 17).

There are substantial indicators, based on past studies, that emerging virus outbreaks during COVID-19 may exacerbate psychological discomfort amongst frontline workers. Studies from the 2003 SARs outbreak showed that those healthcare workers feared contagion and infection of their family, friends and colleagues; felt uncertainty and stigmatization; reported reluctance to work or contemplating resignation; and reported experiencing high levels of stress, anxiety and depression symptoms, which could have long-term psychological implications (Bai *et al.* 2004: 1056; Lee *et al.* 2007: 233). Concerns about the mental health, psychological adjustment and recovery of healthcare employees who treat and care for COVID-19 patients are now being raised. Moreover, reported risk factors included a lack of perceived psychological preparedness and self-efficacy to help patients, social isolation; and fear of improper use or unavailability of personal protective equipment (PPE) and associated infection risks (Xiao *et al.* 2020: 6; De Kock *et al.* 2021: 9-12; Spoorthy *et al.* 2020: 3).

Research emanating from the COVID-19 pandemic suggested that dramatic changes in the work environment and elevated risk levels in hospital and pre-hospital settings have induced significant pressure, anxiety, depression and burnout in healthcare workers during the COVID-19 pandemic (Lai *et al.* 2020 6; Buselli *et al.* 2020: 2; El-Gindi *et al.* 2021: 3-5). In South Africa, anticipatory anxiety and other heightened emotional states were initially evident amongst healthcare workers at the onset of the pandemic (Thorn, 2020: 716). As COVID-19 caseloads and healthcare worker infections increased, ongoing unremitting stress increased the risk of distress, burnout and moral injury (a reflection of dissonance between clinical practice and personal values), as well as specific psychiatric disorders. A study by Hoque *et al.* (2021: 3) evaluating the psychological

influence of COVID-19 on 159 Primary Healthcare workers in South Africa reported that 59% of HCWs had moderate stress, while 38% reported severe stress. The same study further reported that 80% of HCWs experience severe anxiety and 71% reported mild to moderate depression. According to Gunnell *et al.* (2020: 4), the high-stress roles coupled with the unique demands of the COVID-19 crisis have undoubtedly placed frontline healthcare workers at additional risk of mental health problems, with early reports from around the world indicating elevated rates of depression, anxiety, post-traumatic stress disorder (PTSD) and suicidality.

Measurements of mental health status in recent studies have primarily focused on HCWs in the hospital setting or those in HICs (Banerjee *et al.* 2021; Chow *et al.* 2021; De cock *et al.* 2021). Health impacts on EMS personnel who work in environments that pose a high risk of infection and uncertainty, an area of neglected research, require intervention and greater attention from society and relevant authorities (Awais *et al.* 2021: 75; Buick *et al.* 2020: 427). Furthermore, EMS settings in LMICs do not reflect those in the HICs. The South African EMS system is mainly championed by EMS personnel who have been trained to provide emergency medical care to patients in the pre-hospital setting. Countries like the United Kingdom may employ doctors and nurses who are more equipped to deal with these kinds of cases to work in the pre-hospital setting. The following sub-headings will highlight the common themes found in published studies on the challenges faced by HCWs, mainly those working in the pre-hospital environment.

2.6.1 High prevalence of stress and anxiety

Numerous studies have suggested that stress and anxiety are common concerns amongst HCWs worldwide (Lai *et al.* 2020; Dreher *et al.* 2021, 6; Usul *et al.* 2020: 563). Stress is defined as a process in which environmental demands strain an organism's adaptive capacity, resulting in both psychological demands as well as biological changes that could place one at risk of illness (Salleh 2008: 9). Stress can occur at work in situations when personal and professional demands exceed the ability of an employee, or when that employee is expected to fulfill duties beyond their capabilities (Ilczak *et al.* 2021: 2). The WHO (2020a) has suggested that stressful situations in professional life are often linked to a lack of the relevant competencies required for carrying out allocated tasks, low support and motivation from superiors, or a loss of control over situations related to carrying out professional duties. Processes allowing for full control over professional obligations have been interrupted as a result of occupational stress influencing the working environment during the COVID-19 pandemic. The spread of the virus has introduced a long list of threats and changes. Moreover, personal safety standards during emergency medical

procedures involving direct (face-to-face) contact with patients have taken on a new dimension due to the epidemiological threat (Liang *et al.* 2014: 301-303).

A study by Ilczak *et al.* (2021: 2-3) has suggested that the professional group under the highest level of stress are those working in emergency medical services, namely the nurses, doctors and EMS personnel on the frontline of the fight against this pandemic. De Kock *et al.* (2021: 8-9) concluded that nurses entering into direct contact with COVID-19-infected patients have been the HCWs most at risk of developing these adverse results during the pandemic. This could be easily explained by the fact that nurses spend more time with their patients as compared to doctors or EMS personnel, thereby increasing the likelihood of being infected. Furthermore, Lai *et al.* (2020) suggested that being a woman and possessing an intermediate professional title was associated with higher anxiety, depression and distress. The study by Liang *et al.* (2020: 1) explored the relationship between age and depressive symptoms. Although younger medical personnel (30 years) had higher self-reported depression scores than senior staff (30 years), the difference was not statistically significant.

Usul *et al.* (2020: 565–569) examined the effects of the COVID-19 pandemic on the anxiety level of emergency medical services professionals and reported that anxiety amongst women was 3 times greater than those observed amongst male practitioners. They further suggest that the degree of anxiety was inversely proportional to the years of service/age. HCWs who have greater years of experience may have previously encountered highly infectious patients and therefore have the knowledge and experience to treat them. Skoda *et al.* (2020: 3-4) further suggested that the highest qualified practitioners (Advanced Life Support) demonstrated lower levels of anxiety as opposed to practitioners with lower levels of qualifications (Basic Life Support). Advanced Life Support practitioners may have been exposed to training programs, while Basic Life Support has not had the same exposure. As with other HCWs professional, EMS personnel expressed fears over the risk of suffering from COVID-19; being concerned over infecting family and/or friends; thinking they had no proper personal protective equipment; or feeling more nervous were factors that significantly increased the anxiety levels of out-of-hospital health professionals (Usul *et al.* 2020: 563-569; Vujanovic 2021: 320–335). Dreher, *et al.* (2021, 6-8) found that the symptoms of anxiety were caused by an increase in workload due to the pandemic, thoughts about COVID-19 contraction at the workplace, a shortage of colleagues/staff, the childcare situation, not being able to let patients down, uncertainty about how to act correctly, uncertainty about contact persons, uncertainty about their financial situation, and uncertainty about temporal scope. All these factors were suggested to compound the anxiety levels amongst EMS personnel and affected their

psycho-social wellbeing. Spoorthy (2020: 2) underlined socio-demographic variables, such as age, gender, profession and workplace, whereas psychological variables, such as poor social support and self-efficacy, affect the stress level experienced by health workers, further highlighting the need to explore this research topic amongst EMS practitioners operating in the resource-limited setting of South Africa.

Ardebili *et al.* (2021, 547–554) and Zolnikov and Furio (2020: 375–379) identified other factors including high workloads; the feeling of having lost control of the situation; the feeling of not being useful; isolation and separation from loved ones; lack of support and understanding amongst family members and friends; and the fear of dying. In contrast, a study with a sample size of 1537 EMS personnel in Germany revealed that key related stressors to the COVID-19 pandemic decreased within 5 weeks (Dreher *et al.* 2021: 1). The study was conducted during two different waves of the COVID-19 pandemic, and the conclusion could have been referring to the second wave in which EMS personnel were already "acclimatized" to the new normal.

The ensuing sub-sections will further discuss isolation, fatalism, lack of protocol, stigma and discrimination as triggers for stress and anxiety amongst HCWs during the COVID-19 pandemic.

2.6.1.1 Isolation of HCWs during the pandemic

In an attempt to limit the spread of the virus, the WHO (2020) published guidelines for the clinical management of COVID-19-infected persons and those who were in close contact with an infected person. Those who had contracted the virus, whether symptomatic or asymptomatic, had to self-isolate for 14 days or visit a medical facility if their symptoms were severe (WHO, 2020). Being at risk of infection forces many HCWs to stay away from family members, ultimately isolating themselves from those who support them (Fernandez, 2021: 8). Isolating oneself from family members is not that difficult when there is enough room for everyone. However, HCWs in LMICs may not have the desired number of rooms to isolate themselves from the rest of their family members. This includes not having enough money to book a hotel, meaning that the anxiety levels in LMICs may be even higher amongst HCWs than documented in HICs. Isolation protocol dictated that even if one was not infected or had close contact, the government had implemented the suspension of social activities, restriction of traveling, shopping and outdoor entertainment, being confined to the home for an unknown amount of time, the long-term isolation of family members, the restriction of social interactions, and all these instances have had a significant psychological impact on the general population, including HCWs (Yang *et al.* 2021: 5).

Various publications suggest that these challenges have resulted in increased family tensions and difficulty in leisure time management for families worldwide (Kalil *et al.* 2020: 18; Fegert *et al.* 2020: 3), with some family members even pressuring HCWs to quit their jobs (Cotrin *et al.* 2020: 4). HCWs' duties include direct contact with COVID-19 patients, and their growing concern with infecting their family members rather than themselves being infected has been suggested as compounding their mental stresses (Razu *et al.* 2021: 6). This saw many HCWs staying longer at work without returning home or when they did return to their homes, there were limited interactions and contact with their loved ones. The long duration of quarantine not only had an effect on staff shortages, but there was an also association with the number of days staying in isolation, which ultimately exacerbated staff shortages and put more strain on other HCWs (Duan and Zhu, 2020: 301).

2.6.1.2 Fatalism

Fatalism is another challenge as a result of social prevention strategies and is one of the primary psycho-social concerns related to COVID-19. Fatalism means feeling powerless and helpless to change the direction of events that are occurring (Hayes and Clerk, 2021: 2). Considering the helplessness of people believing in fatalism, some studies cite it as a barrier in a crisis (Alipour *et al.* 2020: 14). According to Hayes and Clerk (2021: 3), fatalism is positively associated with depression but negatively associated with fear and insecurity, thereby causing a direct impact on human resources and resulting in staff shortages due to psychological distress. The power of helplessness is sometimes caused by misinformation circulated on social media, news channels and other sources, which makes people feel overloaded and as a result, an individual may succumb to a form of fatalistic behavior (Jimenez *et al.* 2020).

A study report by Taylor and Asmundson (2021: 10) observed that throughout the COVID-19 pandemic, many people rejected the idea of wearing a mask or taking the necessary precautions due to the negative influence of social media. Jimenez *et al.* (2020) suggested that certain groups of people often associated the coronavirus with death. Moreover, fatalism caused distrust between people and healthcare professionals. It is however not known how this phenomenon influenced HCWs in LMICs, a concept that this study is grounded in exploring. Razu *et al.* (2021; 4) stated that this feeling of helplessness resulted in health professionals experiencing insomnia. In addition to the already overwhelming work environment, HCWs deprived of sleep and adequate rest are a danger not only to the patients but to themselves as well (Gupta and Sahoo 2020: 3). Therefore, studies suggested that health professionals need special attention to avoid fatalism

and minimize their physical and mental adversities (Razu *et al.* 2021: 6; Duan and Zhu, 2020: 302).

2.6.1.3 Stigma and discrimination

Stigma refers to a set of social processes invoked to label, separate and discriminate against others in a way that interferes with that individual's (or group's) life chances and opportunities (Link and Hatzenbuehler, 2016: 653). Considering Goffman's Social Stigma Theory (Goffman, 1963, 3), stigma is defined as an "attribute that is deeply discrediting", and it occurs as a discrepancy between how a person who is characterized by society and the attributes possessed by a person (Ahmedani, 2011: 2). During previous disease outbreaks, HCWs have been stigmatized (e.g., shunned, ostracized) by community members out of fear that they are sources of infection. To illustrate, during the 2003 outbreak of SARS, in studies conducted in Taiwan and Hong Kong, 20–49 % of HCWs involved in the care of SARS patients reported being shunned, avoided or otherwise stigmatized by people in their community for fear that HCWs were infected with the SARS coronavirus (Bai *et al.* 2004:1057; Koh *et al.* 2005: 676). What compounds this is that HCWs even face stigma from family members, which adds an unnecessary burden to their lives.

Considering HCWs, the experiences of stigma by the general population have contributed to psycho-social tensions and social barriers (Simeone *et al.* 2022: 8; Taylor *et al.* 2020: 2; Gupta and Sahoo 2020: 6). According to several studies, neighbors and the community in general perceived that the health workers carry a higher risk of infection from their exposure to patients and as a result, healthcare professionals are being treated harshly and shunned from society which may demotivate them to serve patients (Razu *et al.* 2021: 6; Ramaci *et al.* 2020: 2-3). While misinformation and fear may be the primary drivers for stigma, the lack of information may also be a huge contributing factor in LMICs.

According to Ehrlich *et al.* (2020: 1446) and Ghebreyesus (2020: 129), EMS personnel faced an increased risk of stigma as a result of their direct exposure to COVID-19. Stigma is an unfavorable stereotype that can result in a variety of negative consequences, including anxiety, depression, devaluing, rejection, stress, health problems, risk exposure, and limiting protective factors. Studies by Adams and Walls (2020) as well as Banerjee *et al.* (2020), as cited in Razu *et al.* (2021: 6), suggested that healthcare professionals need social support from their family members, relatives, neighbors and the community at large. Being devoid of that support may result in anxiety and depression for healthcare professionals.

2.6.1.4 Absence of a comprehensive protocol to address COVID-19-related cases

According to Lexipol (2019), EMS protocols are the recognized operating procedures that all emergency medical services professionals, such as paramedics and emergency medical technicians (EMTs), must follow for patient assessment, treatment, transportation and delivery of definitive care. During the current COVID-19 crisis, EMS providers are faced with the challenge of the absence of a comprehensive care protocol with clear instructions on how to deal with COVID-19 patients. The absence of such a protocol could adversely affect the performance of EMS personnel and the quality of care provided by them (Mohammadi *et al.* 2021: 5). The pre-hospital industry is still in its infancy when compared to in-hospital practitioners who base their patient treatment on the latest evidence, as EMS personnel rely heavily on protocols provided by the professional body (Safi-Keykaleh *et al.* 2021: 2). In the absence of such a protocol, EMS personnel cannot practice on evidence-based research as they have a limited scope of practice, which is not the case for in-hospital HCWs. Razu *et al.* (2021: 5) raised concerns that as COVID-19 spread across the globe, the WHO guidelines were changing continuously given the novelty of the virus and previous knowledge about it being little. Consequently, health professionals remained uncertain about the line of treatment and these uncertainties created additional mental stress for medical professionals. There is therefore a need for proper coordination and access to information during a public health emergency like COVID-19 in order to ensure quality healthcare services.

Mohammadi *et al.* (2021: 1) argued that emergency care administrators and policymakers should provide EMS personnel with a comprehensive and systematic protocol to provide care to COVID-19 patients. A comprehensive and systematic protocol should consist of clinical instructions on the provision and evaluation of care provided to COVID-19 patients; promotion of public education on how to handle pre-hospital emergency care; and development of protocols for supervising EMS personnel's provision of care to COVID-19 patients at home (Mohammadi *et al.* 2021: 3). Furthermore, in uncontrollable situations such as a pandemic, when specific action protocols are absent, EMS personnel must make individual decisions with a heavy burden of responsibility that may be contrary to their moral principles. In this regard, Cai *et al.* (2020: 6-7) showed that for a sample of 534 HCWs who worked closely with COVID-19 patients in Hubei, one of the most stressful factors was the lack of protocols for the treatment of COVID-19. The Africa Health Strategy (AHS) 2016-2030 therefore advocated stronger collaboration amongst various stakeholders, including government, civil society and the private sector, to better leverage knowledge and expertise and mobilize resources to fight health challenges like the COVID-19

pandemic (OCHA, 2020). This will allow for inter-country and intra-country protocols that speak to one another and allow for a coordinated approach to addressing a global crisis like COVID-19.

2.6.2 Fear of infection

The transmission of the COVID-19 virus can be easily spread by air through small liquid particles from an infected person's mouth or nose when they cough, sneeze, speak, sing or breathe heavily (Ningthoujam 2020: 132). Fear of contracting the disease was a primary concern for most HCWs. In the early stages of the pandemic, Europe had one of the highest numbers of reported infections and deaths. In March, Italy reported the highest number of deaths of HCWs than any other country, attributed to 57% of total HCWs' deaths (Lapolla *et al.* 2020: 364). Despite the low mortality rate of 2 %, the COVID-19 virus has a high transmission rate, and the mortality is higher than that caused by severe acute respiratory syndrome (SARS) and middle east respiratory syndrome (MERS) combined (Mahase, 2020: 1). According to Magnativa *et al.* (2021: 2), the virus has caused more than 326 deaths amongst Italian doctors and 81 deaths amongst nurses. It is further reported that in the first 12 months of the pandemic, approximately 3600 HCWs died in America (Spencer *et al.* 2021). Data collected by the Daily Maverick (2021) suggested that there had been more than 1300 who have died of COVID-19 since the beginning of the pandemic. While some studies have emerged regarding the prevalence of infection amongst different hospitals, no data is available on the prevalence of EMS personnel infections. A study by Buselli (2020: 2) suggested that those HCWs who feared infection of their close ones reported experiencing high levels of stress, anxiety and depression symptoms, which could have long-term psychological implications. Brooks (2020: 53) argued that the COVID-19 high mortality rate, high transmission capacity, and the shortcomings of health systems have impacted the mental health of HCWs. Moreover, the current COVID-19 outbreak has shown high infection rates amongst HCWs. A systemic review of infection and mortality of HCWs reported a total of 152 888 infections and 1413 deaths (Bandyopadhyay, 2020: 1). The high rate of the spread of infections of the COVID-19 pandemic resulted in a large number of patients that needed intensive care. This caused a significant effect on the psycho-physical wellbeing of HCWs. Mache *et al.* (2013) also indicated that healthcare workers are more likely to develop post-traumatic stress disorder, anxiety, depression and other symptoms of distress. Considering that health facilities are under-staffed and HCWs already work long hours, doing so within a pandemic like COVID-19 exacerbates the psycho-physical challenges.

Nabe-Nielsen (2020: 1-7) investigated the fear of infection and fear of transmission of infection amongst HCWs working within eldercare, hospital/rehabilitation, psychiatry, childcare and pre-

hospital services. She concluded that fear of infection and fear of transmitting the disease to the private sphere (i.e., from work to family members) was most frequent amongst EMS personnel. Unlike the in-hospital environment, ambulances are tiny, enclosed spaces that do not circulate air very well and airborne diseases are trapped for longer. Lindsley *et al.* (2019: 7-8) found that aerosols resulting from patient coughs spread homogenously across the entire ambulance due to ventilation systems, and that there are no spots with a lower risk of infection within a vehicle. While the fear of infection maybe due to the environment that EMS personnel work in, Nabe-Nielsen (2020: 1) argues that the feeling of insecurity amongst employees and the fear of becoming infected or transmitting infection is aggravated by insufficient information; lacking access to personal protective equipment (PPE); and sub-optimal management of the workplace's response to the crisis. However, some studies have alluded to the lack of training as also being a cause in increasing fear and infection rates. The results of the study by Cash *et al.* (2020: 780) in the US showed that despite their education, 40% of the EMS personnel still need to be educated on N95 respirator fit testing and the use of PPE at the time of chemical, biological and nuclear threats.

Furthermore, in the study by Martin-Delgado *et al.* (2020: 1) conducted in three Latin American countries, nearly 70% of the included participants (doctors, nurses and other healthcare professionals) did not have access to enough PPE, especially gowns, N95 respirators and face shields, and 51.4% did not even have enough knowledge on how to use PPE, both of which had some adverse effects on the quality of healthcare during the pandemic. The study noted that most healthcare professionals felt less prepared and scared as they did not receive sufficient training. Most governments did not have enough time to prepare and train HCWs as the onset of the pandemic was rapid. Usul *et al.* (2020: 564), found that a total of 35.8% (n=144) of the participants lived with family members at risk of COVID-19. However, 23.1% of the participants were worried about their family members getting infected, while 62.2% (n=250) were concerned about infecting their family members. The study surveyed 402 participants, including physicians, nurses, EMS personnel and drivers, but did not differentiate which profession was more concerned about infecting their family members. Much like many other studies, EMS personnel are grouped with other allied healthcare workers, therefore making it difficult to understand and manage the industry as a profession on its own. This study is grounded in the notion of the investigation and understanding of EMS personnel's challenges during the COVID-19 pandemic, thus adding to the body of research for managers and policymakers to use for future planning.

2.6.3 Lack of Personal Protective Equipment

The rapidly expanding pandemic has put a strain on the global healthcare system, outstripping hospital capacity to satisfy the demand for critical medical equipment such as intensive-care unit beds, ventilators and personal protective equipment. Personal Protective Equipment is the equipment used to prevent or minimize exposure to hazards such as biological, chemical, radiological, electrical and mechanical hazards (WHO, 2022). PPE protects HCWs from the potential transmission of main radiation (enhancing radiation safety in healthcare) and biological agents (viruses, bacteria, etc.). As the pandemic spread and continued to cause havoc, one of the concerns has been the increasing cost and scarcity of personal protective equipment and other necessities. In China, Xiang (2020: 228) reported shortages of masks and sanitary equipment in public emergencies. The protective equipment or disinfectants which were expected to act as a shield against COVID-19 and lessen the people's concerns now became a main social concern due to the scarcity and cost (Xiang, 2020: 228). This is consistent with prior research on issues related to the scarcity of key supplies during pandemics. During an exploratory study of burnout, Fernandez (2021: 26) found that the most common source of anxiety amongst HCWs during the COVID-19 pandemic was access to PPE. Several other studies have highlighted the lack of PPE as an important predictor of stress for HCWs in large-scale emergencies (Du *et al.* 2020: 144; El-Hage *et al.* 2020: 74; Walton *et al.* 2020: 242). Ranney *et al.* (2020: 2) noted that before the pandemic, China produced approximately half the world's face masks and as the infection spread across China, their exports came to a halt. Other countries, including several in Europe, would subsequently report dangerously low supplies of PPE (Burki 2020: 786). This caused a huge supply chain problem worldwide as many countries relied on China for PPE imports.

At the start of the outbreak, many countries across the continent struggled with an acute shortage of PPE due to global supply disruptions, exacerbated by Africa's heavy reliance on imports for essential medical equipment (The Guardian, 2020). The shortage of PPE increased the fear of contracting the infection, which in turn led to some psychological disorders and occupational depression (Mohammadi *et al.* 2021: 7). At the same time, the lockdowns and reduced purchasing power hampered demand for many traditional manufactured products. LMICs like Ghana, Ethiopia and Kenya, with the help of the private sector, had to pivot to re-purpose manufacturing capability to produce essential medical supplies such as sanitizing products and PPE (Mamo, 2020).

In South Africa (SA), where the COVID-19 epidemic was still developing, healthcare facilities had a short window of opportunity to improve PPE supply chains, train staff on prudent PPE use, and devise plans to track and manage the inevitable increases in PPE demand. SA healthcare facilities developed contingency plans for expected PPE shortages, and the following tiered PPE preservation strategies were considered:

- Restricted use: use PPE as recommended in the national infection prevention guidelines, minimise the access of visitors to healthcare facilities, cohort staff to COVID high- v. low-risk areas and limit the number of staff performing aerosol-generating procedures, e.g., one staff member performs COVID-19 testing;
- Extended use: use PPE for longer periods of time than normally recommended and/or while caring for several different patients without removal, e.g., visors and surgical masks;
- Procurement of alternative or emergency replacement PPE: e.g., 3D printed face shields and plastic rain ponchos or refuse bags to replace aprons;
- Use of PPE after the manufacturer-designated shelf-life: e.g., use of masks after the expiry date;
- Procurement of re-usable PPE: e.g., goggles or re-usable plastic visors instead of disposable visors; and
- Re-use of PPE: this involves the decontamination of PPE items that would normally be disposed of after use (single-use items), e.g., N95 respirators. Re-use should only be considered as a last resort when PPE supplies are about to run out and there are no alternatives available. Re-use of PPE in COVID-19 critical care settings was avoided owing to the increased risk of HCWs infection.

2.6.4 Burnout and suicide risk

Burnout is a psychological syndrome emerging as a prolonged response to chronic interpersonal stressors on the job (Maslach and Leiter, 2016: 103), while suicide is a highly complex and multifaceted phenomenon with many contributing and facilitating variables (Levi-Belz, 2019). There is growing evidence involving HCWs in the incidence of burnout and suicide across all groups of health professionals in many countries. Most of the time, there is no hint of mental illness detected by colleagues, friends or even family. According to Maslach and Leiter (2016: 103), the three key dimensions of this response are overwhelming exhaustion, feelings of cynicism and detachment from the job, as well as a sense of ineffectiveness and lack of accomplishment. Timothea (2020: 636) reported the news of the Emergency Director Medical Director who committed suicide. The cause of suicide was unknown. However, El-Hage (2019:

74) stated that the reality of witnessing suffering and death consistently and communicating complex information to patients and families with poor coping skills increases the risk of developing burnout. Maslach and Leiter (2016: 104) argue that there is a reciprocal relationship between burnout and depression, with each predicting subsequent developments in the other. Another similar case was in Italy where 2 nurses were reported to have committed suicide due to unsustainable pressure at work (Lapolla *et al.* 2020: 365). These are just some of the suicide incidents reported. One must wonder how many more such incidents go unreported.

A study of 1257 HCWs in Italy by Lai *et al.* (2020) discovered that HCWs who assisted patients in COVID-19 wards experienced high levels of mental health issues, and this was prevalent in young female frontline workers. Galbraith *et al.* (2020: 2) argued that most evidence suggests that doctors and nurses feel a strong professional obligation to continue working despite the danger. Moreover, Litz *et al.* (2009) suggested that having to balance their safety with the needs of patients, family and employers in the face of limited resources can lead to distressing ethical dilemmas for doctors and, potentially, to moral injury. Moral injury can arise when one feels compelled to make decisions that conflict with one's ethical or moral values (Galbraith *et al.* 2020: 2). Several studies have pointed out that women are particularly more vulnerable to experiencing anxiety, depression and distress when compared to their male counterparts (Lai *et al.* 2020; Zanardo *et al.* 2020). However, a longitudinal study in Japan (over 5 years) found that there were twice as many cases of mental disorders and incidences of suicide in men than in women (Yamauchi, 2018: 375). The above-mentioned studies highlighted the age of 29 and 30 to be ages with the highest cases (Yamauchi, 2018: 37; Lai *et al.* 2020; Zanardo *et al.* 2020; Liang *et al.* 2020). While studies may not offer a definitive answer about which gender, age group or working group is more vulnerable/susceptible to burnout and suicide risk, they all have common predictive factors. Physical illness, solitude, the sensation of having no one to talk to, a refusal to seek assistance because of the stigma associated with mental health, substance misuse issues, suicidal thoughts, and emotions of hopelessness are all factors that contribute to suicide.

Cai *et al.* (2020: 14) conducted a study on 534 frontline medical staff at the National Clinical Research Center for Infectious Diseases in Shenzhen, China and discovered that nurses were more nervous as compared to doctors. The triggers of stress amongst the engaged staff included loss of control and vulnerability to infection, fear for personal health, and the spread of the novel virus (Cai *et al.* 2020: 14). Multiple studies have found evidence that the young and female HCWs are more vulnerable and susceptible to burnout and stress due to COVID-19 when compared to their much older and male colleagues (Timothea, 2020; Lapolla *et al.* 2020; Lai *et al.* 2020; Liang

et al. 2020). This therefore suggests that response strategies and support mechanisms for HCWs should factor in these dynamics of gender, age and work experience so that each sector has its needs attended to in an appropriate way. In the study of Matsuo *et al.* (2020: 3), which investigated the prevalence of burnout in healthcare professionals during the COVID-19 outbreak in Japan with the participation of 488 healthcare professionals, the overall burnout prevalence was found to be 31.4% (98 out of 312). Moreover, 59 (46.8%) of 126 nurses, 8 (36.4%) of 22 radiology technologists, and 7 (36.8%) of 19 pharmacists were experiencing burnout. They found that the prevalence of burnout was high in women. However, the study had a significantly higher percentage of women (71%) as part of the research group.

According to San *et al.* (2020: 2), EMS utilization rates have increased during the COVID-19 pandemic. The out-of-hospital health workers at greater risk of presenting depressive-type symptoms were those who were suffering any illness that increased the risk of being infected with COVID-19; those who did not feel protected by personal protective equipment; and those with less work experience (Dreher *et al.* 2021; Vujanovic *et al.* 2021). EMS personnel work a 12-hour shift (4 days in and 4 days out) cycle, which adds up to 196 hours a month, excluding overtime due to late calls. Increase workload, the nature of the work, organizational and occupational factors such as workload, work demands, shift work, limited time for debriefing or downtime, the hierarchical nature of supervision, and the lack of recognition are clearly shown to have effects on the well-being of ambulance personnel that are as significant as, if not greater than, the nature of the work itself (Lawn *et al.* 2020: 2). Although EMS personnel are paid for overtime work, Celmeçe and Menekay (2020: 2) argued that stress, fatigue and increased workload can have various consequences such as musculoskeletal disorders, and one of the most likely negative consequences of these conditions is increased burnout in healthcare (Çelmçe and Menekay, 2020: 2). During COVID-19, where staff shortage was already at an all-time high, the increase in overtime may not be a suitable solution as it increases burnout on other HCWs.

2.7 Coping mechanisms

Coping is defined by cognitive and behavioral efforts employed in response to external or internal demands that the individual deems to be threats to their well-being (Freire *et al.* 2020: 2). Past studies have shown that HCWs who were at high risk of exposure to infectious disease outbreaks exhibited extreme stress, were emotionally influenced and traumatized, and had extreme levels of symptoms of depression and anxiety (McAlonan *et al.* 2007: 241). In addition to self-distraction and active coping strategies, numerous other strategies have been identified such as denial and

substance abuse, use of emotional support, use of informational support, and behavioural changes. These various coping strategies are frequently classified into different groups: problem-focused and emotion-focused. According to Fluharty and Fancourt (2021: 3), these strategies typically focus on the stressor and one's actions towards it (e.g., seeking emotional support or planning to resolve and reduce stressors), while by contrast, 'avoidant' strategies seek to avoid the stressor and one's reaction to it (e.g., withdrawing from others, substance use, and denying the reality of the stressor). According to Frijda (1994), as noted by Huang *et al.* (2020: 2), specific coping strategies are triggered by specific emotions and vice-versa. Certain behaviors are thought to be motivated by certain characteristics of emotions, according to some theories. For example, fear is associated with the desire to avoid and protect oneself from incidents, anger is associated with the desire to attack, disgust is associated with the desire to expel, and happiness is associated with the desire to entertain oneself (Huang *et al.* 2020: 2).

HCWs have frequently reported feeling cut off from their effective networks during the COVID-19 emergency, either due to the restrictions on social contact imposed by the lockdown, or as a result of the fear of spreading the infection to their family members. Due to the psychological emergency of the COVID-19 outbreak, from the beginning of the outbreak, over 500 mental health professionals have volunteered to support healthcare workers through multiple Organisations (i.e., HWCN, a collaboration between the SA Society of Psychiatrists (Sasop), SA Medical Association (SAMA), Psychological Society of SA (PsySSA), SA Depression and Anxiety Group (Sadag) and SASA). These are all free services. However, no research has been conducted to investigate if HCWs are using them and how effective they have been in the context of South Africa. Stress can be alleviated most effectively by identifying and eliminating its sources, but this is not always feasible. Nonetheless, to get through the challenges and the associated factors affecting the mental health and wellbeing of HCWs, different coping strategies have been noted in the literature. The following sub-section will discuss coping strategies employed by HWCs during the COVID-19 pandemic.

2.7.1 Religious/spiritual coping

HCWs used meaning-focused coping like religious/spiritual coping. Pargament *et al.* (2011) as cited in Chow *et al.* (2021) described religious coping as a form of coping skill that utilizes religion in dealing with life's adversities. Religious coping consists of positive and negative religious coping skills. Positive religious coping involves benefitting from a favorable bond with God by praying or connecting to God during crises, while on the other hand, negative religious coping refers to blaming God for one's hardship (Chow *et al.* 2021). The use of religious and spiritual

approaches, such as prayers and attendance at places of worship, was also common in several studies (George 2020: 10; Htay *et al.* 2021: 5; Chow *et al.* 2021: 7-8). Existing research indicates a stronger link between negative religious coping and psychological distress than previously thought. A study on medical students showed significant correlations between negative coping with anxiety and depression, but not with positive coping (Francis *et al.* 2019: 9-10). Although there were recent studies amidst the COVID-19 pandemic which revealed the association of positive religious coping with a reduction in psychological morbidities, existing evidence showed a stronger association between negative religious coping and mental health outcomes (Chow *et al.* 2021: 2).

Religious coping has become increasingly common, not only in religiously based communities but also in communities all over the world. Prayers and meditation may reduce anxiety and stress through distraction. The actions of the religious community may also reduce stress by fostering close family ties and strong support. In a qualitative study developed by Munawar *et al.* (2021: 24), the 15 EMS personnel interviewed affirmed that they turned with greater frequency to the following coping strategies to face the situation of uncertainty derived from the COVID-19 pandemic: religion, passion for serving their community and country, the feeling of having complied with their commitment, altruism, empathy, non-exposure to the communications media, and thinking that it is just another emergency.

2.7.2 Social/organizational support

In a review of the literature, Spoorthy (2020: 2) underlined that socio-demographic variables such as age, gender, profession and workplace, and psychological variables such as poor social support and self-efficacy, affect the stress level experienced by health workers. In addition, COVID-19 emerged as an independent factor for stress risk. More studies found that social support plays a role in reducing the anxiety levels in medical staff and increasing their sense of self-efficacy (Xiao 2020: 5; Chang and Hu 2022: 8). The loss of a social support network, which can be important to resilience, is another risk factor (Ozbay *et al.* 2007). People who are in a social relationship are better able to manage their stress because they can listen to and encourage one another, regulate their emotions, and remain resilient. During the COVID-19 emergency, HCWs have often experienced a separation from their social support, either because of the restrictions imposed by the lockdown or the fear of spreading the infection to family members. Additionally, although at first health workers received unanimous encouragement from the population, later they also experienced stigma and isolation. Some studies have shown that being able to resort to their own social support network is a significant protective factor for health

workers dealing with this emergency (Cai *et al.* 2020: 13). Support from friends and family has been imperative for HCWs, but social distancing may have hampered physical interaction, confining some HCWs to social media and online platforms. This could be a double-edged sword as some reports have suggested media exposure to be a stressor for some HCWs. Cia *et al.* (2020: 14) found that the support of superiors proved to be one of the most important motivational factors for medical staff, and the presence of clear guidelines and effective safety protocols were protective factors against the development of stress. In a hospital, HWCs have much more resources and support when compared to EMS personnel working in the pre-hospital setting. This was expressed in a study by Parvaresh-Masoud *et al.* (2021: 1120), whereby most of the participants were dissatisfied with the lack of support they received from managers and authorities, while most HCWs complained about stigma and discrimination in the community.

2.7.3 Positive re-framing

According to Robbin and Wright (2019: 162), positive re-framing is defined as "construing a stressful transaction in positive terms" and involves thinking about a negative or challenging situation in a more positive way. This could entail considering a benefit or upside to a negative situation that one had not previously taken into consideration. In a study of 2166 participants (mostly from LIMCs), about 70% of the respondents answered that "getting family support" and "positive thinking" were coping methods for them during the COVID-19 pandemic (Htay *et al.* 2021: 3). The study only mentions doctors and nurses, while all other professions were labeled as 'other HCWs'. HCWs employed a variety of adaptive interventions and coping strategies to increase perceptions of self-efficacy. Amongst them, "stop unpleasant emotions and thoughts" was the strategy acting as a predictive factor of less organizational–relational stress, physical stress, emotional stress, cognitive stress and COVID-19 stress, as well as less physiological and psychological activation and obsessive thoughts as symptoms of secondary trauma (Vagni *et al.* 2020: 5). The Health Group appeared to have greater success with this strategy in terms of lowering Arousal levels than the other groups. They were able to normalize their stress by recalling the nature of their responsibilities and reminding themselves that this is not the first time that they have faced potentially dangerous situations. Most medical professionals now recite the Hippocratic Oath, which states that: "I will apply, for the benefit of the sick, all measures [that] are required", though nowhere does it state that they must work in settings that could put their health at risk (Nelson, 2020: 1). Some HCWs may not feel that way, but due to fear of discrimination from colleagues, they continue treating patients reluctantly. HCWs continue to do their work

knowing the dangers involved. This has seen HCWs being applauded all over the world for being brave and for their heroism in putting their lives on the line to save others.

Cai *et al.* (2020: 8) found that the support of superiors proved to be one of the most important motivational factors for medical staff, and the presence of clear guidelines and effective safety protocols were protective factors against the development of stress, more so for females. Furthermore, Walton *et al.* (2020) identified organizational stressors as the changes in work shifts, the prevalence of night shifts, an excessive workload, staff roles, autonomy, the lack of support from superiors, and the absence of adequate information and clear instructions. Based on these stressors, they estimated that 10% of the medical staff working on the front-line of this pandemic are at risk of developing post-traumatic stress disorder (PTSD). A few studies have also investigated the coping strategies that emergency workers can employ in the event of a health emergency similar to COVID-19. According to Maunder *et al.* (2006) as cited by Vagni *et al.* (2020: 4), healthcare professionals who tended to apply dysfunctional coping strategies based on avoidance, hostile comparison or self-blame tended to develop higher stress levels. One example would be when HCWs are reminded of the oath they took in order to make them feel guilty for not wanting to work due to a lack of resources and protocol. This would lead HCWs to tend to apply dysfunctional coping strategies to cope. In conventional methods like seeking psychological/psychiatric help, most HCWs find it difficult to share their problems. According to Hassan *et al.* (2013) as cited by Galbraith (2020: 1), many doctors would rather seek help from friends and family than look for a psychological/psychiatric consultation. This may be because other allied HCWs may see them as weak and not able the handle the profession. For this reason, more research is needed to understand the challenges faced by the profession in order to better tailor personalized coping strategies.

2.8 Chapter Summary

There is a steadily growing body of knowledge on the global influences of the COVID-19 pandemic. Research that reviews the psychological influence of COVID-19 on pre-hospital HCWs, their work environment and their livelihood is however limited. There is relatively little data on the direct psycho-social experiences of affected people, specifically HCWs, during the COVID-19 outbreak, especially in African countries. Sim (2020: 281) argued that a physically, mentally healthy and well-equipped workforce is key to a country's ability to manage COVID-19 cases effectively, and that lessons can be learned from the epidemic. Furthermore, Çelmeçe and Menekay (2020: 2) warned that if the appropriate actions to protect HCWs are not taken, they will

exhibit high levels of burnout associated with depressive symptoms, anxiety, suicidal ideation, and develop substance abuse. This research sought to identify the challenges that pre-hospital personnel deal with and assist healthcare leaders to tailor a support system to mitigate the long-term effects of burnout and support mental health of HWCs. Identifying the psycho-social influences of COVID-19 can help ensure that the proper psycho-social interventions are employed in different stages of managing public health emergencies to prevent mental and social problems and ultimately control the public health emergency as quickly as possible. Moreover, it can help society return to a normal life with the fewest losses.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

The focus of this chapter is the research design and methodology used to guide this study. This chapter provides insight into the research design and then goes on to discuss the research procedure, data collection and analysis procedures. The study further employed a cross-sectional descriptive survey design with the aim of obtaining reliable data that can generate robust conclusions and create new hypotheses by assessing the exposure, perception, work load, stress and coping strategies amongst EMS personnel during the COVID-19 pandemic.

3.2 Research design

A research design is described as a plan for obtaining answers to the questions being studied and for handling some of the difficulties encountered during the research process (Polit & Beck 2004: 49). According to Morvaridi (2005), the most prevalent methodologies in social sciences and humanities' research methodology are quantitative and qualitative research (El-Gohary, 2008: 4-3). To achieve the objectives of this study and address the research problem, the researcher used quantitative research methodology and adopted a cross-sectional descriptive survey design.

According to Maree (2016: 162) and Sharique *et al.* (2019: 2828), quantitative research is a process that is systematic and objective in its use of numerical data from only a selected sub-group of a universe (or population) to generalize findings to the universe that is being studied. It entails the use of statistical tools to analyse numerical data to answer questions such as who, how much, what, where, when, how many, and how. The quantitative research methodology was employed in this study based on the following reasons:

- Quantitative research is replicable and thus allows for other researchers to carry out further research into the subject being researched;
- The method allows for the use of closed-ended questions rather than open-ended questions. If open-ended questions were to be used, there would be different responses from participants due to the narrative nature of the answers. This would make the data analysis a daunting task to execute and thus time-consuming as there would be different

responses to a particular question. It would eventually make the interpretation of the answers relatively difficult, which may cause the desired results to not be achieved;

- Quantitative research designs allow for the use of self-administered questionnaires as compared to the qualitative method. This research will make use of a survey questionnaire to collect data from participants; and
- It is time-saving and cost-effective and will not require a lot of funds to execute.

According to Check and Schutt (2012: 160), survey research is defined as "the collection of information from a sample of individuals through their responses to questions". This type of research allows for a variety of methods to recruit participants, collect data and utilize various methods of instrumentation (Ponto 2015: 16). Quantitative and qualitative research methods can both be used in survey research. Some examples of quantitative research methods include using questionnaires with numerically rated item strategies (e.g., using open-ended questions), or both strategies (e.g., mixed methods). According to Lau and Kuziemsky (2017: 228), there are three broad types of survey studies reported in the e-Health literature: exploratory, descriptive and explanatory surveys. They are described below.

- **Exploratory Surveys** – These studies are used to investigate and understand a particular issue or topic area without predetermined notions of the expected responses. The design is mostly qualitative in nature, seeking input from respondents with open-ended questions focused on why and/or how they perceive certain aspects (Decarlo, 2019: 164); and
- **Descriptive Surveys** – These studies are used to describe the perception of respondents and the association of their characteristics with an eHealth system. Perception can be the attitudes, behaviours and reported interactions of respondents. Association refers to an observed correlation between certain respondent characteristics and the system (Lau, 2017: 228). The design is mostly quantitative and involves the use of descriptive statistics such as frequency distributions of Likert scale responses from participants.

The current study will use descriptive surveys as the study wants to explain the hypothesized relationships between some respondent characteristics. The design is quantitative, involving the use of inferential statistics such as regression and factor analysis to quantify the extent to which certain respondent characteristics lead to or are associated with specific outcomes (Decarlo, 2019: 166).

A cross-sectional study is defined as a type of observational research that analyses data of variables collected at one given point in time across a sample population or a pre-defined subset

(Setia 2016). In a cross-sectional study, the investigator measures the outcome and the exposures in the study participants at the same time (Zangirolami-Raimundo *et al.* 2018: 356; Lau and Kuziemsky, 2017: 221). According to Zangirolami-Raimundo *et al.* (2018: 256-257), some of the critical characteristics of a cross-sectional study include:

- Researchers can conduct a cross-sectional study with the same set of variables over a set period;
- Similar research may look at the same variable of interest, but each study observes a new set of subjects;
- The cross-sectional analysis assesses topics during a single instance with a defined start and stopping point, unlike longitudinal studies, where variables can change during extensive research; and
- Cross-sectional studies allow the researcher to look at one independent variable as the focus of the cross-sectional study and one or more dependent variables.

Hence, this study employed a cross-sectional descriptive survey design as the researcher wanted to create a hypothesis by identifying the stressors, perception, exposure, and coping methods amongst EMS personnel working during the COVID-19 pandemic period. The design used descriptive statistics such as frequency distributions of Likert scale responses from the participants, specifically the 4-point Likert scale. Furthermore, the researcher had to take into account that survey designs have multiple options, including time, respondent group, variable choice, or data collection. This study used the data collection option as they can be conducted by questionnaire or by an interview with structured, semi-structured or non-structured questions.

3.3 Research paradigm

Brink *et al*. (2012) defined a paradigm as a set of ideas about basic phenomena, how they interact and how they may be projected as reality. Lather (1986) argued that a research paradigm inherently reflects the researcher's beliefs about the world that s/he lives in and wants to live in (Kivunja and Kuyini 2017: 26). A post-positivist paradigm using a deductive approach was the design adopted for this study. Post-positivists accept that one cannot observe the world one is part of as totally objective and disinterested outsiders and accept that the natural sciences do not provide the model for all social research (Schwandt, 2007: 225). This can be misinterpreted as a positivist paradigm, which maintains the belief that reality is out there to be studied, captured and understood. However, the post-positivist paradigm accepts that reality can never be fully understood, but at best, only approximated (Guba, 1990: 20).

3.4 Researcher's role and reflexivity

Shaw (2010: 235) defined reflexivity as the act of examining one's assumptions, beliefs and judgments, and thinking carefully and critically about how this influences the research process. The act of reflexivity forces one to confront and question who one is as a researcher, as well as how these influences one's work. It is at the heart of arguments about objectivity, subjectivity and the basic underpinnings of social scientific research and knowledge creation (Dodgson, 2019: 220). The researcher plays various roles as outlined below:

- To draft the research concept or proposal for approval of the research undertaking;
- To compile and review literature from previous articles and reports written on the subject matter;
- To organise the study instruments for the purpose of collecting primary data from the sample of respondents;
- To distribute the research instruments, which were sent to the gatekeeper electronically;
- To gather completed questionnaires from the respondents (survey, electronically) and to ensure completeness;
- To carry out data analysis, interpret the results and make conclusions and recommendations pertaining to the study; and
- To present the final research report to the supervisor for review.

It is worth noting that the researcher was previously employed by the Eastern Cape Department of Health as an EMS personnel. Although it was only for a period of 12 months, the researcher built strong professional and personal relationships with colleagues working in the public and private EMS sectors. Therefore, the researcher understood the role of being objective and not getting personally involved in the research study. Understandably, bias could happen at any stage of research and there is a need to be cognisant of these to avoid them (Pannucci & Wilkins, 2010: 621). Some of the considerations for this study were to acknowledge and avoid bias as follows.

a. Selection Bias - To avoid selection bias in the study, the entire population was invited to participate (2776 EMS personnel). Therefore, higher quality feedback and decreased selection bias was expected. The study results were also not generalized for the entire South African population, rather the detail was contextualized to the findings of the particular geographical area of study;
b. Confirmation Bias – When a Hypothesis or Idea of the study is formed, the researcher makes all efforts to consolidate that viewpoint while neglecting other evidence that may

be contrary to the particular view taken. In this study, there was no hypothesis to be proven. Furthermore, there were no viewpoints that are taken at the onset, rather it was explorative and descriptive. There were questions and objectives to be met, but the study was expected to reveal the answers to the questions without researcher manipulation. All study feedback and analysis were preserved as evidence of the study;

c. Data Collection Bias – Data was collected using the Questionnaire Survey method. The tools used were subjected to DUT IREC approval. The results and discussion are evidence-based, with raw data retained as evidence. A Statistician was also employed to guide the process and reduce bias. Factors such as Question Order Bias, Wording Bias and Leading Questions were considered in the construction of the survey tool;
d. Sponsor Bias – This did not apply in this study. It must also be stated that the researcher had no financial disclosures other than part-requirement for the qualification. The study's emphasis was on the research process as opposed to results or outcomes, although this was given equal importance. Therefore, there were no researcher gains from the study outcome, financially or otherwise; and
e. Citation Bias – Reporting on only selected articles supporting the hypothesis or ideology has already been alluded to in 'Confirmation Bias' and was controlled by consulting a comprehensive database of research articles/information on the study. Moreover, subject matter experts were involved in supervising the study to limit skewed reporting. This type of bias was also related to researcher ethics, which was guarded against.

3.5 Study setting

Burns and Grove (2005: 359) stated that the study setting is the location where a study is conducted. The study intended to report on EMS personnel working and living in the Eastern Cape Province. South Africa is divided into nine Provinces, namely Northwest, Gauteng, Free State, Kwa-Zulu Natal, Mpumalanga, Eastern Cape, Western Cape, Limpopo, and Northern Cape. The Eastern Cape Province is situated along the south-east coast of South Africa. It is made up of 8 districts and represents 16% (third largest) of the South African population (Polity, 2012). The province is described as having a non-urban population that amounts to nearly 4 100 000 and has a dense concentration of rural and peri-urban settlements (Polity 2012). According to the 2016 results from Statistics South Africa (2016), that number has risen to 7 million, making it the third most populated province in the country, behind Gauteng (13, 4 million) and KwaZulu-Natal (11,1 million).

Rural areas in the Eastern Cape are, by definition, those areas that are without access to ordinary public services such as water and sanitation and are without formal local authority (SAHRC, 2015). These areas are characterized by inferior infrastructure, low income, poor site conditions, unreliable water availability, and poor access to health facilities (Polity, 2012). There are an estimated 91 EMS bases and 447 ambulances across the entire Eastern Cape Province. Considering the estimated population size, the ratio of the population to the ambulance is fifteen thousand people per ambulance in the Eastern Cape. This falls well short of the recommended one ambulance per ten thousand people (SAHRC, 2015).

3.6 Study population

According to Polit and Hungler (1999: 37), a population is an aggregate of all the objects or members that conform to a set of specifications. Banerjee *et al.* (2007: 151) further argued that a study population may be defined by geographic location, age and sex, with additional definitions of attributes and variables such as occupation, religion and ethnic group. Furthermore, the target population must also be exclusive enough to avoid having participants who do not represent the study's needs, which will misrepresent the population of interest. Just like the population of interest, the boundaries of the target population must be defined such that the researcher and other stakeholders understand the nature and extent of the group to be studied (LoBiondo-Wood and Haber, 2002: 242). This study considered EMS personnel working in the Eastern Cape as the target respondents. The total population of registered EMS personnel working in the Eastern Cape Province (South Africa) was estimated to be 2776.

3.7 Study sample

LoBiondo-Wood and Haber (1990: 250) described a sample as a portion or a subset of the research population selected to participate in a study, representing the research population. Given that the sample may represent only a portion of the target population, the researcher needs to carefully examine whether the selected sample size fits the study objectives or hypotheses (Martínez-Mesa *et al.* 2016: 327). Since small samples may produce less accurate results, the researcher employed the Aaker and Day (1859) sample size equation, which social sciences researchers universally accept as it considers the degree of required confidence, the sample error ratio of population characteristics available in the sample (50% in social sciences) and the population size (Burmeister and Aitken 2012: 6-8).

The sample size can be determined using the following equation: $S=Z\sqrt{p(1-p)/n}\sqrt{(N-n)/N-1}$

Z= Degree of required confidence (95%)

S= Sample size error (5%)

p= ratio of population characteristics available in the sample (50%)

N= Population size

n= Sample size

Using the above formula, the researcher determined that a population size of 338 would be an acceptable sample size.

3.8 Sampling strategy

Before going into the several types of sampling methods, it is important to understand what sampling is and why researchers choose a sample. According to Martínez-Mesa *et al.* (2016: 327), sampling can be defined as the process through which individuals or sampling units are selected from the sample frame. Furthermore, it can be used to make inferences about a population or to make generalizations in relation to existing theory. In essence, this depends on the choice of sampling technique (Martínez-Mesa *et al.* 2016: 327; Delice, 2013: 6). According to Banerjee and Chaudhry (2010: 63), a sample is defined as random if every individual in the population sampled has an equal likelihood of being included. There are two main types of sampling:

- Probabilistic/probability – or random sampling: random sampling is the basis of all good sampling techniques and disallows any method of selection based on volunteering or the choice of groups of people known to be cooperative (Banerjee and Chaudhry, 2010: 63); and
- Non-probability – a non-random sampling: non-probability sampling is often associated with a case study research design and qualitative research. With regard to the latter, case studies tend to focus on small samples and are intended to examine a real-life phenomenon, not to make statistical inferences in relation to the wider population (Yin, 2003: 48).

It is necessary to decide on a broad sampling approach before deciding on a specific sort of sample technique. The several types of sampling strategies are depicted in the figure below (Figure 3.1).

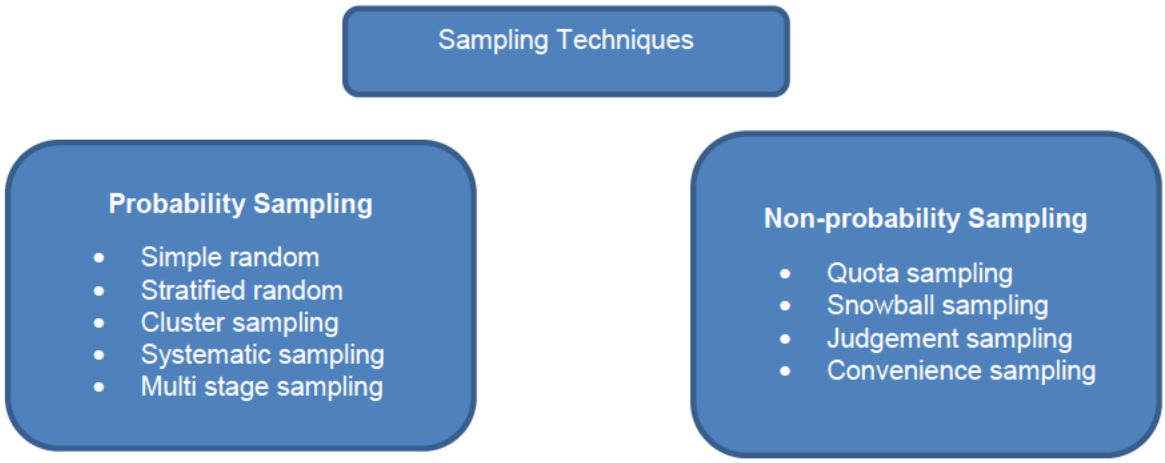

Figure 3.1: Sampling techniques

The researcher employed the probability sampling method, more precisely the simple random sampling technique. Probability methods are based on the principle of randomness and probability theory, and probability samples satisfy the requirements for the use of probability theory to accurately generalise the population (Maree, 2016: 192). Furthermore, if the sample is chosen at random, it is quite likely to be representative of the entire population.

The simple random sample means that every case of the population has an equal probability of inclusion in the sample (Taherdoost, 2017: 238). To ensure that everyone from the study population had an equal chance of being selected, the researcher worked with the assumptions that:

- All EMS personnel in the Eastern Cape received the request to participate in the study through WhatsApp, email and the DOH portal.
- All EMS personnel in the Eastern Cape have internet access and a devise (smart phone, tablet, laptop, desktop computer) that they can use to connect online to complete the questionnaire.
- All EMS personnel are digitally literate as their day-to-day job requires the electronic capturing of patient data.

The researcher used simple random sampling because it is aligned with the quantitative method being used in the study and has the following advantages:

- It can be concluded in a short duration of time;

- It involves a lesser degree of judgment, therefore less chance of sampling bias (Maree 2016: 193); and
- It is a comparatively easier way of sampling.

3.9 Sampling process

The size was based on the formula outlined in the previous section (sub-section 3.6). Based on the formula, a sample size of 357 participants was seen as sufficient. Gatekeeper permission was secured from the Department of Health (see Appendix A). Once approved, a research information letter (Appendix B) was electronically shared (via WhatsApp, email, and DOH portal) with the district/base managers to be disseminated to all EMS personnel working within their region. The researcher's contact details were provided to all the participants, and they were able to contact the researcher regarding the study, and regarding any questions they may have had. Finally, participants who met the criteria and were willing to participate proceeded with the research study after signing the consent letter (Appendix C).

3.10 Inclusion and Exclusion criteria

Polit and Beck (2004: 290) define eligibility criteria as the criteria that specify the characteristics that people in the population must possess in order to be considered for inclusion in a study. Comparably, exclusion criteria are characteristics that disqualify a person from being included in a sample (Decarlo, 2019: 266). The eligibility criteria for inclusion in the study under discussion were:

a. EMS personnel employed by the Eastern Cape Department of Health;
b. EMS personnel registered with the Health Professions Council of South Africa (HPCSA); and
c. EMS personnel employed within the Eastern Cape as EMS personnel during the COVID-19 pandemic.

The exclusion criteria are as follows:

a. EMS personnel who are volunteers;
b. EMS personnel not registered with the HPCSA; and
c. Participants not working during the last 2 years of the pandemic.

3.11 Data collection process

Data collection is the process of gathering the information needed to address a research problem (Polit and Beck, 2004). It involves adhering to the use of research methods and instruments by the researcher in the process of conducting research. The data was collected through an online survey using a self-administered questionnaire to the respondents. According to Kumar (2011: 138), a questionnaire is a written list of questions, the answers to which are recorded by respondents. In a questionnaire, respondents read the questions, interpret what is expected and then write down the answers. The questionnaire contained well-structured and closed-ended questions to ensure objectivity and unbiased results. The researcher used a questionnaire based on the following advantages:

- They cover a large number of people and organizations;
- Wide geographical cover;
- Are relatively cheap to generate and distribute;
- No prior arrangement or engagement with the participants is needed; and
- No interview biases.

The researcher also recognized the disadvantages associated with questionnaires. They are a design challenge; may sometimes delay while waiting for responses; assume there are no literacy issues; there is no control over who completes the questionnaire; and there are problems with incomplete questionnaires. A pilot study was employed prior to the commencement of the actual data collection process in order to reduce/eliminate some of these disadvantages.

The questions used in the questionnaire were adapted from an article by Cai *et al.* (2020: 4-13), and which were used to evaluate the psychological influence and coping strategies of frontline medical staff in Hunan, China between January and March 2020 during the outbreak of COVID-19. The adopted questionnaire (Appendix D) for this study was modified to reflect the concepts and variables of interest embedded in the conceptual framework developed for this study, as informed by the literature review on the factors intended to be investigated (Grant and Osanloo, 2015:12). Permission to adopt and modify questions from the study by Cai *et al.* (2020) was sought and granted by the authors (Appendix E). The questionnaires were pilot tested with a similar sample. A total of 15 participants were invited to participate in the pilot study. The results of the pilot study were not included in the final data analysis of the actual study.

3.12 Study Tool

This study used a self-administered and structured questionnaire for data collection. According to research by Barbie (2007: 251) and Beck (2004: 729), questionnaires are used in connection with many modes of observation in society. Structured questionnaires are essential and most directly associated with survey research. The questionnaire for this present study contained pre-developed closed-ended questions and a rating scale with response options. A closed or pre-coded questionnaire is one which offers the respondent a range of answers to choose from, either verbally or from a show card (Wellman *et al.* 2005: 174). The participants were required to complete the survey in their own time in order not to put them under pressure and to allow for privacy.

The survey questionnaire applied the Likert scale for participants to show their level of frequency and importance with the given statement on the metric scale. According to Joshi and Pal (2015: 397), the Likert scale is applied as one of the most fundamental and frequently used psychometric tools in educational and social sciences research. The Likert scale uses a variety of point scales ranging from a 2-point scale to a 10-point scale. Based on a recent empirical study by Dawes (2008), as stated by Pimentel (2010: 109), a 5- or 7- point scale may produce slightly higher mean scores relative to the highest possible attainable score, compared to those produced from a 10-point scale. However, Pimentel (2019: 184) argues that data characteristics on the use of Likert scales show very little difference amongst scale formats in terms of variations about the mean, skewness and kurtosis. Moreover, the Likert scale is a convenient instrument when the researcher wants to measure a construct, accomplished by asking a series of Likert scale questions and then calculating a total score for each respondent (Maree, 2016: 175).

The first section of the questionnaire included 10 demographic questions. The second section consisted of 14 questions that aimed to investigate the emotions experienced by the EMS personnel throughout the COVID-19 outbreak. Each question had four options on a four-point scale: 0 = not at all, 1= slightly, 2 = moderately, and 3 = very much. Within the third section, research was conducted to explore 19 potential sources of stress for the EMS personnel: 0 = not at all, 1 = slightly, 2 = moderately, and 3 = very much. The fourth section included 14 questions to identify factors that might reduce their stress: 0 = never, 1 = sometimes; 2 = often, 3 = always. In the fifth part of the survey, respondents were given 11 questions designed to elicit personal coping mechanisms in reaction to the strain caused by the outbreak. They were given four options for responses, ranging from "not significant at all" to "most important of all" (scores, 0-3). The fifth segment featured questions on what would inspire medical professionals to be more confident in

the face of future outbreaks. There was a total of nine questions in this section, each of which offered an option between four possible replies ranging from "not significant" to "very important" (score, 0-3).

The disadvantage of a structured questionnaire is that respondents are unable to express themselves fully and are constrained to answer questions in the manner specified by the questionnaire. However, Best and Kahn (1998: 115) argue that a structured questionnaire has the advantage of keeping respondents on topic, being less time-consuming, somewhat objective, and easy to tabulate and evaluate. The pilot study solidified the use of the questionnaire as a study tool to meet this study's objectives. Furthermore, it helped to make the questions less ambiguous and more simplified (Appendix D). The results of the pilot study were not included in this study.

3.13 Data Analysis and Presentation

According to Gay (1996: 96), the research plan must include a description of the statistical technique or techniques that will be used to analyse data. After receiving all the surveys, the researcher used a descriptive statistical method to examine the data. The data was extracted from the questionnaire into a Microsoft Excel spreadsheet and was thereafter imported to the Statistical Package for the Social Sciences (SPSS) programme for analysis (version 28.0, SPSS Science, Chicago, USA). Babbie (2007: 450) describes descriptive analysis as statistical computations describing either the characteristics of a sample or the relationships amongst variables in a sample.

The analysis used a descriptive statistical analysis such as means and standard deviations for continuous variables, and frequency distributions for categorical variables. This will constitute a univariate analysis of the data, particularly the demographics of participants. Bivariate analysis was also conducted to assess the relationships between variables. This included the use of the Pearson correlation test to assess the relationships between, for example, identified causes of stress and marital status, pre-existing medical conditions, and/or duration working as an EMS personnel. Regression analysis was also employed to understand the influence of COVID-19 on the psychosocial well-being of EMS personnel. Regression analysis is a statistical process for estimating the relationships amongst variables (Maree. It includes many techniques for modelling and analysing several variables when the focus is on the relationship between a dependent variable and one or more independent variables (Singh and Ramdeo, 2020: 236).

A 95% confidence interval and corresponding p-value of < 0.05 was to be considered statically significant for standard inferential statistics. Furthermore, trends and frequencies were displayed by tables and bar charts. Most of the statistical methods such as correlation analysis, linear regression, t-tests, and analysis of variance (ANOVA) assume that the data follows a normal distribution. Non-parametric tests (sometimes referred to as 'distribution-free tests') are used when you assume the data in your populations of interest do not have a normal distribution.

3.14 Validity and Reliability

Validity explicates how well the collection of data covers the actual area of investigation (Taherdoost, 2016: 28). In simple terms, validity basically entails measuring what is intended to be measured. For this study, the questionnaires were subjected to a content validity test by experts in the field who examined, evaluated and improved them. The experts scrutinised the questions one by one and indicated those relevant to the study (R) and those considered irrelevant (IR). This was assessed, and a Content Validity Index (CVI) was determined by applying the following formula:

CVI = R/(R+IR): CVI is the content validity index; R is the number of relevant items, and IR is the number of irrelevant items. The CVI was compared to the minimum threshold.

Reliability examines the extent to which the measurement of the concept or phenomenon provides stable and consistent results (Taherdoost, 2016: 29-30; Creswell, 2014). Questionnaires were pilot tested to gauge the consistency of the scale that will be used to measure each variable. This was done after the questionnaire had achieved validity. The reliability coefficient of the questionnaire was calculated using the Cronbach Alpha Coefficient of internal reliability. The reliability coefficient is important as it is a measure of the accuracy of a test or measuring instrument obtained by measuring the same individuals twice and computing the correlation of the two sets of measures (Maree, 2016: 123; Heale and Twycross, 2015: 66). Furthermore, the chi-squared X2 test was used to compare the responses between age groups and gender. As such, for the test to be reliable, it also needs to be valid. Hence, the study's validity and reliability are of utmost importance.

Construct validity was also determined in the study. Construct validity refers to how well an assessment measures the construct that it is intended to measure. Given that this study made use of a preexisting data collection instrument that was used in a similar study, construct validity

was noted in how the findings from both studies are correlated or similar (see chapter 5 for the discussion of the results) Furthermore, convergent validity was also determined by establishing the theory-based measure of psychosocial stress which was positively correlated with self-reported stress causing factors amongst EMS personnel (see chapter 5 on discussion of results).

3.15 Ethical considerations

This study conformed to the 2013 Declaration of Helsinki. Approval for this specific study was sought from the DUT IREC. Furthermore, it can be classified as low-risk research as it involves the description and analysis of de-identified data (Creswell, 2014).

In conducting data collection, the following measures were considered:

a. Informed consent: all the participants were given a letter of information to help them decide whether to participate and be allowed to provide written permission for their participation;
b. Voluntary participation: in this study, participants were encouraged to participate out of their own free will. A significant tenet of social research ethics is that participation should be voluntary (Barbie, 2010: 121);
c. Avoidance of harm: in this study, dangers such as physical, emotional or psychological harm were closely guarded against and thoroughly examined. The researcher provided contact details for participants who may be psychologically affected by the study as it may trigger unpleasant memories;
d. Anonymity and confidentiality: the researcher-maintained confidentiality by reaching a consensus that no one, including the researcher, can link the names of the participants with the data provided; and
e. Protection from sensitivity: the study did not have any sensitive issues. However, participants were given an opportunity to refuse to answer any question they would see as sensitive.

3.16 Chapter Summary

This chapter was simply a description of the research methods, tools and procedures applied in the process of gathering data from the respondents. A quantitative approach is selected as the best way to examine and analyse the views of EMS personnel regarding individual and collective experiences since the outbreak of the COVID-19 pandemic. The ethical principles that were upheld were also highlighted in this chapter.

The following chapter provides an analysis of the data.

CHAPTER 4

DATA ANALYSIS

4.1 Introduction

In this chapter, the results obtained after the statistical analyses are presented. Data were collected using online survey questionnaires and those distributed in person. The analysis of quantitative data was done using the Statistical Package for the Social Sciences (SPSS) version 29. As with all social science research studies, analysis was conducted at a 95% confidence interval (CI) and a 95% significance level. SPSS was used to compute the data obtained during this study, from which the key findings related to the research objectives were derived. The intention was to assess data efficiently and to link the conceptual framework of the study to the objectives. The reliability test, skewness, measures of central tendencies, and measures of dispersion played an essential role throughout the process of statistical data analysis.

According to Leedy and Ormrod (2015: 229), statistics should be considered a collection of computational techniques that allows researchers to identify patterns and significance in numerical data. They also note that spreadsheets, such as Microsoft Excel, are one of the software tools that allows researchers to access and edit information in two- and three-dimensional tables. The following objectives guided the data analysis:

I. to identify the working conditions of EMS personnel that exacerbated the stress of working within the context of the COVID-19 pandemic;
II. to identify the factors that reduced stress amongst EMS personnel;
III. to identify the psychological stressors found amongst EMS personnel during the COVID-19 pandemic in Eastern Cape;
IV. to identify the coping mechanisms/strategies used by EMS personnel in the Eastern Cape during the COVID-19 pandemic; and
V. to make recommendations on providing support to and improving the working conditions of EMS personnel in the Eastern Cape.

The research findings presented were from 368 EMS personnel who completed an online questionnaire. The results reflect participants' opinions regarding their experiences during the COVID-19 pandemic. The results obtained from participants were divided into five (5) sections, namely demographic details, factors that caused stress, factors that reduced stress, personal

coping strategies, and motivational factors to work in future pandemics. This chapter also includes descriptive statistics, sub-scales, pairwise correlations, and multivariate regression.

4.2 Section A: Demographic details

The study survey was completed by a total of 368 EMS personnel in the Eastern Cape. Table 4.1 depicts the demographic status of all the participants in the survey. Most of the participants working in the Eastern Cape during the COVID-19 pandemic were males (70%; n=257), while females accounted for the remaining 30% (n=112). This finding coincides with previous EMS-related studies that depict EMS as a male-dominated profession (Mason, 2017: 2). Most participants were in the economically active age group of 35–44 years and socially active participants between the ages of 25 and 34 years, accounting for 41.0% (n=151) and 28.3% (n=104) respectively. The age group 65+ years had the fewest participants (0.5%; n=2). In relation to marital status, 34.2% (n=126) of the participants were married and living with their partners, while 38.3% (n=141) were not married but living with their partners. The results also showed that 27.4% (n=101) of the participants were single. Furthermore, the demographic statistics showed that most participants were non-smokers, had no known medical condition, and had been working within the EMS for approximately 8 to 11 years.

Table 4.1: Demographic of participants

Variables		Frequency (%)
Gender	Male	256 (70)
	Female	112 (30)
Age group	18-24	17 (4.6)
	25-34	104 (28.3)
	35-44	151 (41.0)
	45-54	74 (20.2)
	55-64	20 (5.4)

	65+	2 (0.5)
Marital Status	Married and living with my partner	126 (34.2)
	Not married but living with my partner/spouse	141 (38.3)
	Single	101 (27.4)
Children	Yes, and they live with me	174 (47.2)
	Yes, but they do not live with me	122 (33.2)
	No	72 (19.6)
Smoking Status	Current smoker	104 (28.3)
	Non-smoker	224 (60.9)
	Ex-smoker	40 (10.9)
Known medical condition	Non	154 (41.8)
	Asthma/COPD	53 (14.4)
	Heart disease (i.e., coronary artery disease/hypertension)	51 (13.9)
	Diabetes mellitus	47 (12.8)
	Other	63 (17.1)
Number of years within EMS	0-3 Years	35 (9.5)
	4-7 years	111 (30.2)
	8-11 years	120 (32.6)
	12-15 years	66 (17.9)
	16 years	36 (9.8)
Which district / Metropolitan do you work in	Afred Nzo	8 (2.2)
	Amathole	9 (2.4)

	Buffalo City	89 (24.2)
	Chris Hani	57 (15.5)
	Joe Gqabi	23 (6.3)
	Nelson Mandela Bay	114 (31.0)
	OR Tambo	13 (3.5)
	Sarah Baartman	55 (14.9)
Nature of organization	Public sector (Government)	306 (83.2)
	Private sector	62 (16.8)
Current area of specialty	Operational	353 (95.9)
	Academic	9 (2.4)
	Management	6 (1.6)

4.3 Presentation of results

Sub-section 4.3.1 presents the results linked to the objectives of the study. The results are presented in a bar chart (Figures 4.1-4.5) with percentages reflecting the opinions of participants.

4.3.1 Section B: Attitudes amongst EMS personnel during the COVID-19 pandemic

The objective of the following sub-sections was to reflect the attitudes amongst EMS personnel working in the Eastern Cape during COVID-19. This section reports on the different factors and viewpoints of workers about their compensation, recognition and expectations from the institutional administration during the pandemic.

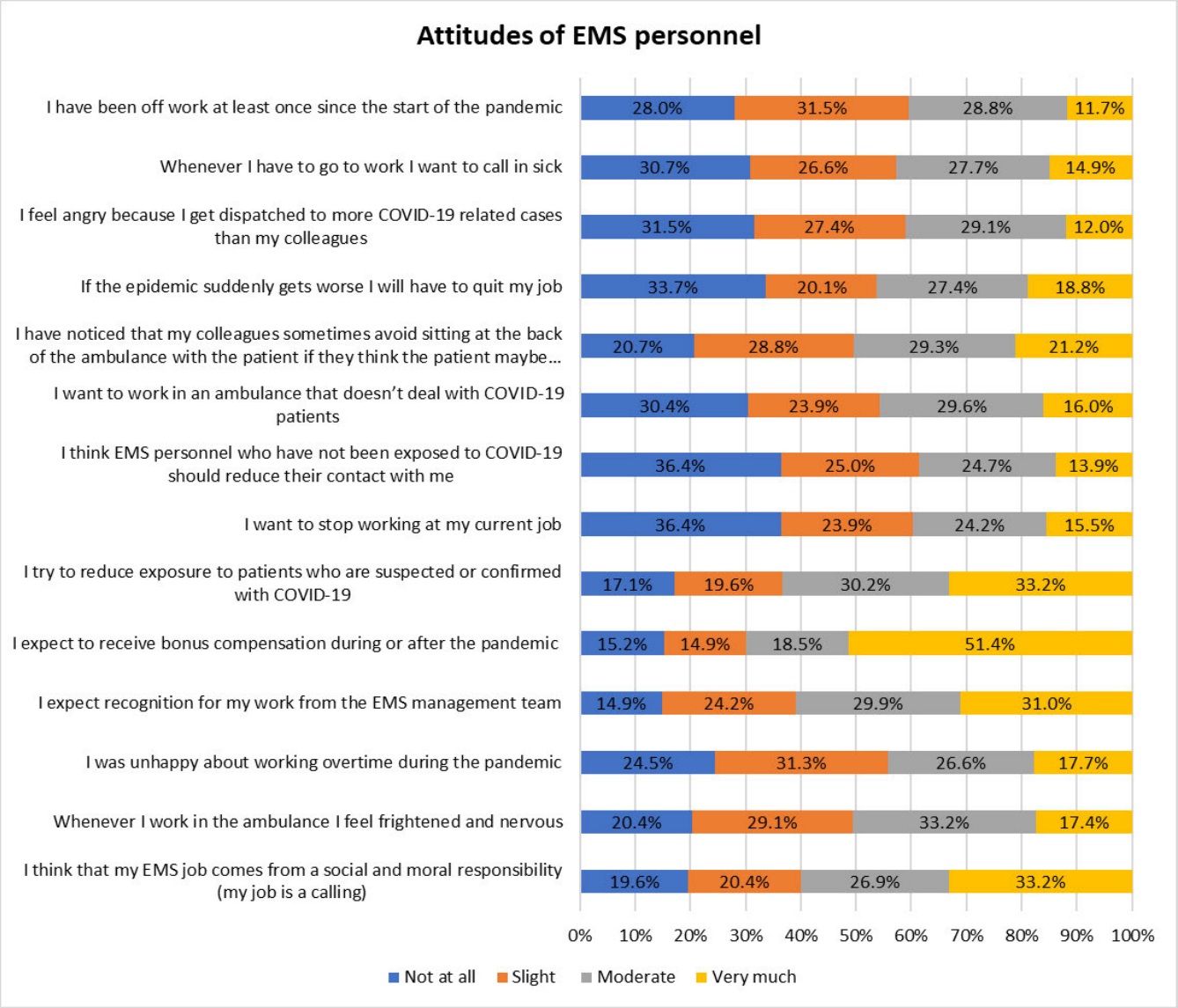

Figure 4.1: Attitudes amongst EMS personnel working during the COVID-19 outbreak

According to the primary data (Figure 4.1), 84.8% (n=312) of the participants were expecting compensation during or after the pandemic. In particular, more than half of the participants (51.4%; n=189) strongly anticipated receiving bonuses, while 18.5% (n=68) had moderate expectations, and 14.9% (n=55) were also slightly optimistic. In contrast, 15.2% (n=56) of the participants were not at all optimistic.

A large number of participants (83.0%; n=304) expressed that they had tried to reduce personal exposure to patients suspected or confirmed of having COVID-19, while the rest did not. In particular, the results showed that a third (33.2%; n=122) of participants had firmly tried to reduce exposure to these patients, while 30.2% (n=111) had moderately attempted to do the same. A further 19.6% (n=72) had also slightly tried to reduce exposure to patients with COVID-19. However, 15.3% (n=56) expressed that they had not attempted to minimize personal exposure to these patients.

Of the participants, 85.1% (n=313) anticipated some recognition for their work from the EMS management. Specifically, 31.0% (n=114) had high expectations, while a similar proportion (29.9%; n=110) had moderate expectations, and a further 24.2% (n=89) had few expectations. In contrast, 14.9% (n=55) of participants had no such expectations

Most participants (80.4%; n=296) were generally confident that their EMS job resulted from a social and moral responsibility (their job is a calling). A third (33.2%; n=122) of the participants strongly believed that their job was a calling, while 26.9% (n=99) moderately agreed, and a further 20.4% (n=75) slightly agreed. However, 19.6% (n=72) did not believe their job was a calling.

According to the primary data (Figure 4.1), 84.8% (n=312) of the participants expected compensation during or after the pandemic. In particular, more than half of the participants (51.4%; n=189) strongly anticipated receiving bonuses, while 18.5% (n=68) had moderate expectations, and 14.9% (n=55) were also slightly optimistic. In contrast, 15.2% (n=56) of the participants were not at all optimistic.

The majority of the participants had personal, occupational expectations from their employers regarding working during the COVID-19 pandemic, as shown by the conclusive findings.

A large number of participants (83.0%; n=304) expressed that they had tried to reduce personal exposure to patients suspected or confirmed of having COVID-19, while the rest did not. In particular, the results showed that a third (33.2%; n=122) of participants had firmly tried to reduce exposure to these patients, while 30.2% (n=111) had moderately attempted to do the same. A

further 19.6% (n=72) had also slightly tried to reduce exposure to patients with COVID-19. However, 15.3% (n=56) expressed that they had not attempted to minimize personal exposure to these patients.

These findings suggest that this group of EMS personnel were scared of exposure to the virus and did not have adequate personal protective equipment (PPE). While the nature of their work involves personal exposure to the sick and injured, it is the responsibility of the health authorities to ensure that EMS personnel have access to appropriate and adequate PPE to lessen the burden of fear.

Most participants (80.4%; n=296) were generally confident that their EMS job resulted from a social and moral responsibility (their job is a calling). A third (33.2%; n=122) of the participants strongly believed that their job was a calling, while 26.9% (n=99) moderately agreed, and a further 20.4% (n=75) slightly agreed. However, 19.6% (n=72) did not believe that their job was a calling. It is reassuring to see that the majority of EMS personnel believe that their work is satisfying and offers them a sense of accomplishment. This commitment creates an ethical and moral dilemma since many EMS personnel have to choose between exposing themselves to patients or their families.

A large number of participants (79.6%; n=293) felt afraid and nervous whenever they worked in the ambulance. Specifically, 17.4% (n=64) felt extremely afraid and anxious while doing their jobs, while a third (33.2%; n=122) moderately agreed, and 29.1% (n=107) slightly agreed. However, 20.4% (n=75) of the participants believed that working in the ambulance had no negative effect on their stress levels.

A large number of participants (69.5%; n=256) wanted to work in an ambulance that did not transport or treat COVID-19-related patients. In particular, 16.0% (n=59) of the participants firmly desired to work in an ambulance that did not treat or transport COVID-19-related patients, while 29.6% (n=109) moderately shared this sentiment. A further 23.9% (n=88) expressed a slight desire to work in an ambulance that did not transport or treat COVID-19-related patients. In contrast, 30.4% (n=112) did not at all have a preference between working in COVID-19 related ambulances or a non-COVID-19-related ambulance.

A large number of participants (79.3; n=292) had noticed how colleagues avoided sitting in the back of the ambulance with a patient if they thought the patient might be infected with COVID-19. Specifically, the results showed that 21.2% (n=78) firmly expressed that they had seen some

colleagues avoid sitting with a patient suspected of being infected with COVID-19, while 29.3% (n=108) moderately agreed with this statement. A further 28.8% (n=106) slightly agreed that they had witnessed this behaviour. In contrast, 20.7% (n=76) of participants expressed that they had not noticed such behaviour.

In light of the study's findings, the researcher noted that similar themes were found in other literary works (Lai *et al.* 2020: 2; Galbraith *et al.* 2020: 1). Ilczak *et al.* (2021: 146) and Chang *et al.* (2020: 13) concluded that prolonged exposure to patients with COVID-19 increases the risk of becoming infected. Therefore, EMS personnel avoid sitting near an infected patient. Furthermore, EMS personnel work in a confined space (ambulance) with limited ventilation (lack of an efficient ventilation system). The lack of a sufficient ventilation system causes air and airborne disease circulation within the ambulance, a source of concern when working with COVID-19-related patients.

The results showed that many participants (66.3%; n=244) believed that they would quit their jobs if the pandemic suddenly worsened. Specifically, the results showed that 18.8% (n=69) strongly felt they would have to leave their jobs should the pandemic suddenly worsen, while 27.4% (n=101) moderately agreed. A further 20.1% (n=74) slightly agreed that they would have to leave their jobs should the pandemic suddenly worsen. In contrast, 33.7% (n=124) believed that a worsening in the pandemic would not influence them to quit their jobs.

The pandemic caused an increase in patient volumes for EMS personnel, creating a need for increased working hours due to increased workload and insufficient resources. EMS personnel were already overworked and worrying about being infected and transmitting the infection to their loved ones caused excessive stress.

Most participants (75.5%; n=278) were unhappy about working overtime during the pandemic, as opposed to the 24.5% (n=90) who had no objection to working overtime. Of the participants, 17.7% (n=65) were firmly against working overtime during the pandemic, while 26.6% (n=98) were moderately against overtime. Furthermore, 31.3% (n=115) expressed slight dissatisfaction about working overtime.

A large number of participants (69.3%; n=255) felt that whenever they had to go to work, they wanted to call in sick. In particular, 14.9% (n=55) of the participants strongly felt like calling in sick when they had to go to work, while 27.7% (n=102) moderately wanted to call in sick. A further 26.6% (n=98) also felt like calling in sick whenever they had to go to work. However, 30.7%

(n=113) did not at all feel like calling in sick whenever they had to go to work. This study is in line with a study by Caviglia *et al.* (2020: 4), which noted a high level of absenteeism from EMS personnel due to fear of contagion, similar to what happened during the Ebola epidemic.

The results showed that 72.0% (n=265) of the participants thought that they had been off work at least once since the pandemic began. Specifically, 11.7% (n=43) strongly thought that they had been off work at least once since the start of the pandemic. Another 28.8% (n=106) moderately agreed that they had been off work at least once since the pandemic began, while 31.5% (n=116) slightly agreed. In contrast, only 28.0% (n=103) did not think that they had ever been off sick since the pandemic started.

The results showed that 68.5% (n=252) of the participants felt angry whenever they were dispatched to more COVID-19-related cases than their colleagues, while 31.5% (n=116) did not seem to mind all. In particular, 12% (n=44) of the participants expressed being intensely angry when dispatched to more COVID-19-related calls than their colleagues, while 29.1% (n=107) moderately agreed that they felt angry. A further 27.4% (n=101) slightly agreed that they were feeling angry when faced with a similar situation.

A large number of participants (63.6%; n=234) felt that they wanted to leave their current jobs, while only 36.4% (n=134) did not feel that way. In particular, 15.5% (n=57) of the participants strongly felt that they wanted to leave their current jobs, while another 24.2% (n=89) moderately felt so. A further 23.9% (n=88) were slightly sure they wanted to leave their current jobs.

The results showed that 63.6% (n=234) of the participants thought that colleagues who had not been exposed should keep their distance. In particular, 13.9% (n=51) were decisive that colleagues who had not yet been exposed should keep far from them, while another 24.7% (n=91) moderately wanted their colleagues to stay away. A further 25.0% (n=92) slightly felt that colleagues who had not been exposed to the virus should keep their distance. In contrast, 36.4% (n=134) did not at all share the same sentiment.

According to the results, participants felt upset whenever they were assigned to more COVID-19-related cases than their colleagues, and if they were required to report to work, they wanted to call in sick or quit. This occurs as a result of participants' perceptions that risk was unfairly distributed to the front-line, making them feel particularly exposed and considering quitting their job.

4.3.2 Section C: Factors that caused stress during the COVID-19 pandemic

The objective of this section is to ascertain stress-related factors amongst EMS personnel while working within the context of the COVID-19 pandemic. Different psychological factors were assessed amongst EMS personnel.

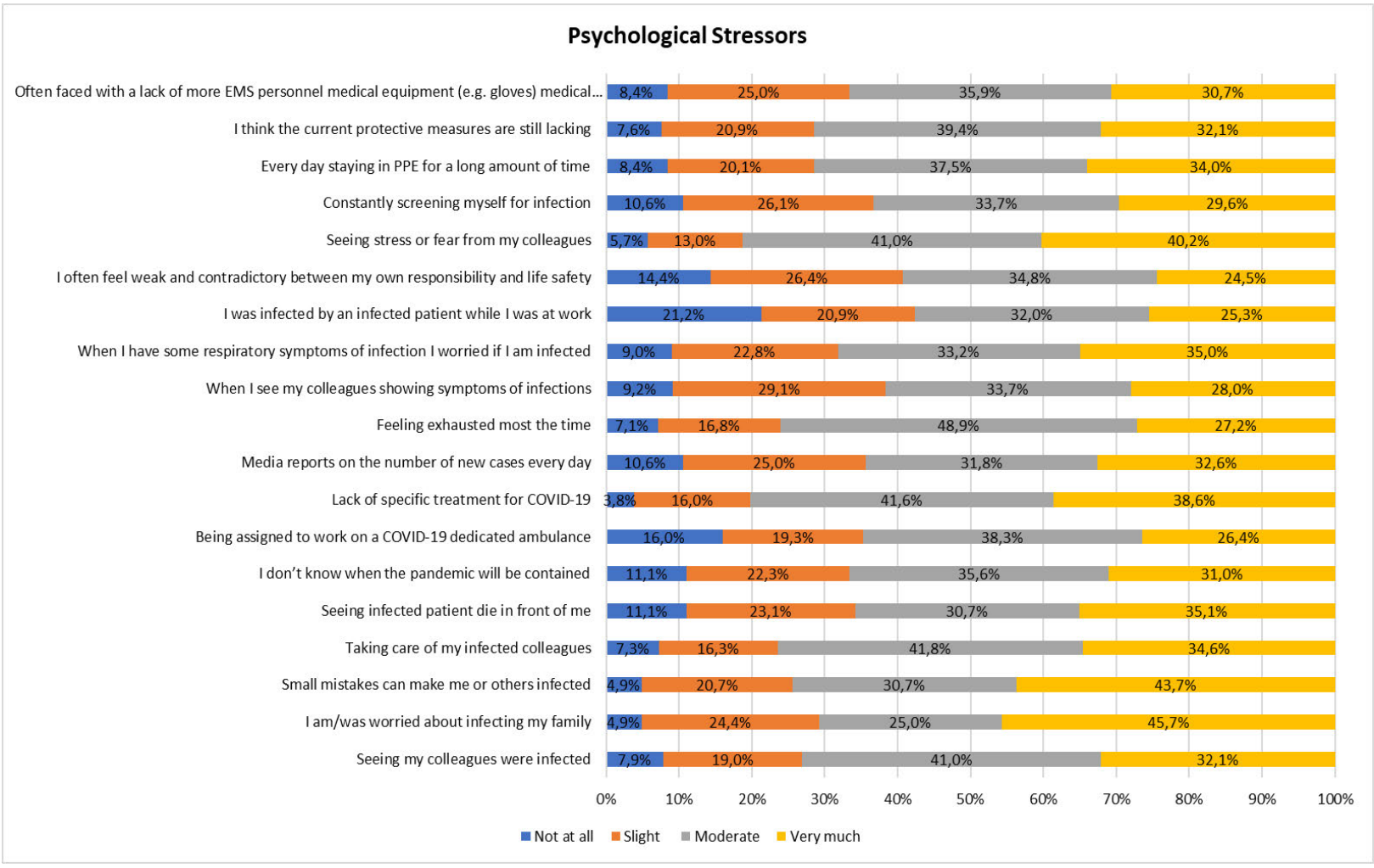

Figure 4.2: Factors that caused stress amongst EMS personnel during the COVID-19 pandemic

According to the results (Figure 4.2), most participants (94.3%; n=347) had observed stress or fear in their colleagues. The findings showed that 40.2% (n=148) firmly believed that they had seen their colleagues being stressed or fearful, while another 41.0% (n=151) were moderately confident that they had seen colleagues being stressed or fearful. Another 13.0% (n=48) believed that they had slightly witnessed colleagues being stressed or fearful. In contrast, 18.8% (n=69) stated that they had not seen any fear. In addition, other stress factors noted had to do with lack

of resources whereby, 30.7% (n=113) strongly felt that resources within the EMS department were inadequate, while 35.9% (n=132) moderately agreed, and another 25.0% (n=92) agreed slightly. However, 8.4% (n=31) of the participants believed that their department had sufficient resources.

The results showed that most participants (96.2%; n=354) believed that the lack of a COVID-19 cure, or treatment, was a stress-causing factor, while only 3.4% (n=14) did not share this sentiment. Of the participants, 38.6% (n=142) strongly believed that the lack of a cure or treatment for the virus was the cause of their stress, while another 41.6% (n=153) moderately believed so. Another 16% (n=59) of the participants slightly agreed that the lack of a cure or treatment was the source of their stress.

Most participants (92.9%; n=342) believed that taking care of their infected colleagues caused them stress. Of the participants, 34.5% (n=127) strongly felt that taking care of their colleagues caused them stress, while 41.8% (n=154) moderately agreed. A further 16.3% (n=60) slightly agreed that taking care of their infected colleagues was a source of stress. Only 7.3% (n=27) disagreed with the statement.

The results showed that 92.9% (n=342) of the participants felt exhausted most of the time. Of the participants, 27.2% (n=100) firmly felt exhausted most of the time, with 48.9% (n=180) moderately shared the same sentiment. A further 16.8% (n=62) slightly agreed with the statement. In contrast, 7.1% (n=26) did not at all feel exhausted.

Several studies have reported exhaustion (physical and emotional) of HCWs as one of the main stress-provoking topics (George *et al.* 2020:1; Morgantini *et al.* 2020:3; Fernandez, 2021: 20; Goh *et al.* 2021:3; Vagni *et al.* 2020: 17) The surge in patient numbers and limited resources (equipment, staff, etc.) resulting in extended working hours has caused a substantial amount of workload for HCWs, in particular EMS personnel. Increased workload and attending to patients fully clad in PPEs was physically exhausting for HWCs in an urban slum in India (George *et al.* 2020: 6). Another study by Lui *et al.* (2020: 794) concluded that HCWs in China were exhausted owing to the intensive care they provided during long shifts in protective suits without toilet breaks.

The majority of participants (95.1%; n=350) felt that small mistakes could leave them, or others infected, while only a few (4.9%; n=18) did not think this was the case. Of the participants, 43.8%

(n=161) of the participants strongly believed that small mistakes could lead to the infection of others and themselves, compared to 30.7% (n=113) who moderately thought so. Furthermore, 20.7% (n=76) slightly felt that contracting the virus from making small mistakes was possible.

Most participants (92.1%; n=339) felt stressed when they saw their colleagues become infected. Specifically, 32.1% (n=118) strongly felt stress as a result of seeing infected colleagues, while another 41.0% (n=151) moderately felt that way. Furthermore, 19.0% (n=70) felt slightly stressed by their colleagues' infection. In contrast, for a small number of participants (7.9%; n=29), this did not cause any stress.

The results showed that 92.4% (n=340) of participants thought that the protective measures were still inadequate. In particular, 32.1% (n=118) strongly felt that the protective measures were still inadequate, while another 39.4% (n=145) moderately agreed. Furthermore, 20.9% (n=77) slightly agreed with the inadequate protective measures. In contrast, 7.6% (n=28) did not believe these measures were inadequate at all.

A large number of participants (91.6%; n=337) felt that staying in personal protective equipment (PPE) for a long duration of time every day was causing them stress. In particular, 34.0% (n=125) strongly felt that staying in PPE for a long-time induced stress, 37.5% (n=138) felt that it moderately caused them stress and 20.1% (n=74) felt that it slightly caused them stress. In contrast, 8.4% (n=31) felt that staying in PPE for long periods of time did not at all cause them stress.

Most participants (91.5%; n=335) felt that they were staying in personal protective equipment for a long time every day, while a small number disagreed (8.5%; n=106). Specifically, 33.9% (n=124) strongly believed that they were spending excessive time in PPE, while another 37.4% (n=137) moderately agreed. A further 20.2% (n=74) also slightly agreed with the statement.

The results showed that 95.1% (n=350) of the participants were worried about infecting their families. In particular, 45.7% (n=168) were apprehensive, 25.0% (n=92) expressed moderate concern, and 24.5% (n=90) were slightly concerned. Only 4.9% (n=18) were not at all concerned about infecting their families.

Most participants (91.0%; n=335) were concerned about being infected whenever they had any respiratory symptoms. Specifically, 35.1% (n=129) of the participants were highly concerned, while 33.2% (n=122) were moderately concerned, and 22.8% (n=84) were slightly concerned. A small group of participants (9.0%; n=33) were not at all concerned.

In a systemic review of the mental health impact of the COVID-19 pandemic on HCWs, Muller *et al.* (2020: 7) noted that an interconnected theme across three studies was distress stemming from concern for infecting family members. EMS personnel have to go back to their loved ones after working with or near COVID-19-related patients, which could make them carriers of the virus, whether it may be via the clothes they wore or as a host for the virus. Several other studies confirm the fear and concern of HCWs infecting their friends and family (Blake, 2020:2; Cui, 2021:591; Saleem, 2020:3; Soto-Cámara *et al.* 2021:2).

A large number of participants (91.6%; n=337) believed that there was a lack of resources (PPE, ambulances, EMS personnel). In particular, 30.7% (n=113) strongly felt that resources within the EMS department were inadequate, while 35.9% (n=132) moderately agreed, and another 25.0% (n=92) agreed slightly. However, 8.4% (n=31) of the participants believed that their department had sufficient resources. Studies by Chersich (2020: 3-4) and Tiwari (2021: 2) concurred with the study findings, as they noted that within Africa, there are limited healthcare resources and a critical shortage of trained HCWs in all cadres. EMS personnel from Iran also noted limited resources and EMS personnel (Saberian 2020: 114).

Most participants (88.9%; n=327) were worried about when the pandemic would end (or be contained). Specifically, 31.0% (n=114) felt extremely anxious about not knowing when the pandemic would end, 35.6% (n=131) were moderately worried, and 22.3% (n=82) were slightly apprehensive. In contrast, 11.2% (n=41) were not concerned about when the pandemic would end.

The results showed that 88.9% (n=327) of the participants felt that seeing infected patients die was causing them stress. In particular, 35.1% (n=129) strongly felt that this was a significant contributor to their stress, while 30.7% (n=113) were moderately in agreement, and another 23.1% (n=85) slightly agreed. Only 11.1% (n=41) did not agree with the statement at all.

The results showed that 84.0% (n=309) of the participants felt that being assigned to work on a COVID-19-dedicated ambulance was a source of stress. Specifically, 38.3% (n=97) firmly felt stressed when assigned to a COVID-19-dedicated ambulance, while 38.3% (n=141) moderately agreed with the statement, and 19.3% (n=71) slightly agreed with the statement. In contrast, 16.0% (n=59) felt that being assigned to a dedicated COVID-19 ambulance did not influence their stress levels.

Most participants (89.4%; n=329) felt that the increasing number of new cases reported by the media was causing them stress. In particular, 32.6% (n=120) strongly felt that media coverage of new COVID-19 cases raised their stress levels, while 31.8% (n=117) moderately agreed, and 25.0% (n=92) slightly agreed with the statement. However, 10.6% (n=39) of participants believed that media coverage of new COVID-19 cases did not affect them.

The majority of participants were under stress due to the media's reporting of more and more new COVID-19 cases. Gonzalez and Nasseri (2020) concluded that media reports, editorials and studies have all provided extensive documentation of the factors that contribute to the contamination, ailment and death of others. Media sources have noted an exceptional number of patient deaths, which has added to their stress, as well as watching people struggle. A qualitative study from China concluded that both nurses and doctors found it challenging to observe patients' experiences (Liu *et al.* 2020). The challenge to differentiate the actual facts from fake news and media could also be a stress source.

Results showed that 89.4% (n=328) of the participants reported they were constantly screening themselves for infection. In particular, 29.7% (n=109) firmly believed in the importance of continually screening oneself for infections, while 33.7% (n=124) moderately agreed, and 26.2% (n=96) slightly agreed with the statement. On the other hand, 10.6% (n=39) of participants felt it unnecessary to screen themselves for infection constantly.

Most participants (90.8%; n=334) were worried about being infected whenever they saw a colleague showing symptoms of infection. Specifically, 28.0% (n=103) of the participants believed that seeing their colleagues showing symptoms of infection made them worry about getting infected, while 33.7% (n=124) moderately agreed and 29.1% (n=107) slightly agreed. However, 9.2% (n=34) of the participants were not worried about being infected, even when they saw their colleagues' showing symptoms of infection.

According to the results, 78.8% (n=290) of participants believed that a patient at work had infected them. In particular, 25.3% (n=93) strongly believed they were infected by a patient at work, while 32.6% (n=120) moderately agreed, and another 20.9% (n=77) slightly agree with this statement. However, 21.2% (n=78) did not believe that they were infected by any patient during working hours. In line with this study, Cui (2021: 585) concluded that physicians, nurses and EMS personnel are more likely to be infected than any other group.

The results further showed that 85.6% (n=315) of participants felt weak and in a quandary about their responsibility on the one hand and life safety on the other. In particular, 24.5% (n=90) of participants strongly felt in a quandary and weak regarding their responsibility and safety. A further 34.8% (n=128) were moderately in agreement, while another 26.4 (n=97) were in slight agreement with the statement. In contrast, 14.4% (n=53) had no conflicting feelings between their responsibility and life safety.

4.3.3 Section D: Factors that helped reduce stress during the COVID-19 pandemic

The objective of this section is to reflect on factors that helped to reduce stress amongst EMS personnel in the Eastern Cape during the COVID-19 pandemic. Several factors, including social interactions, were also evaluated in terms of reducing stress amongst colleagues in the Eastern Cape during the pandemic.

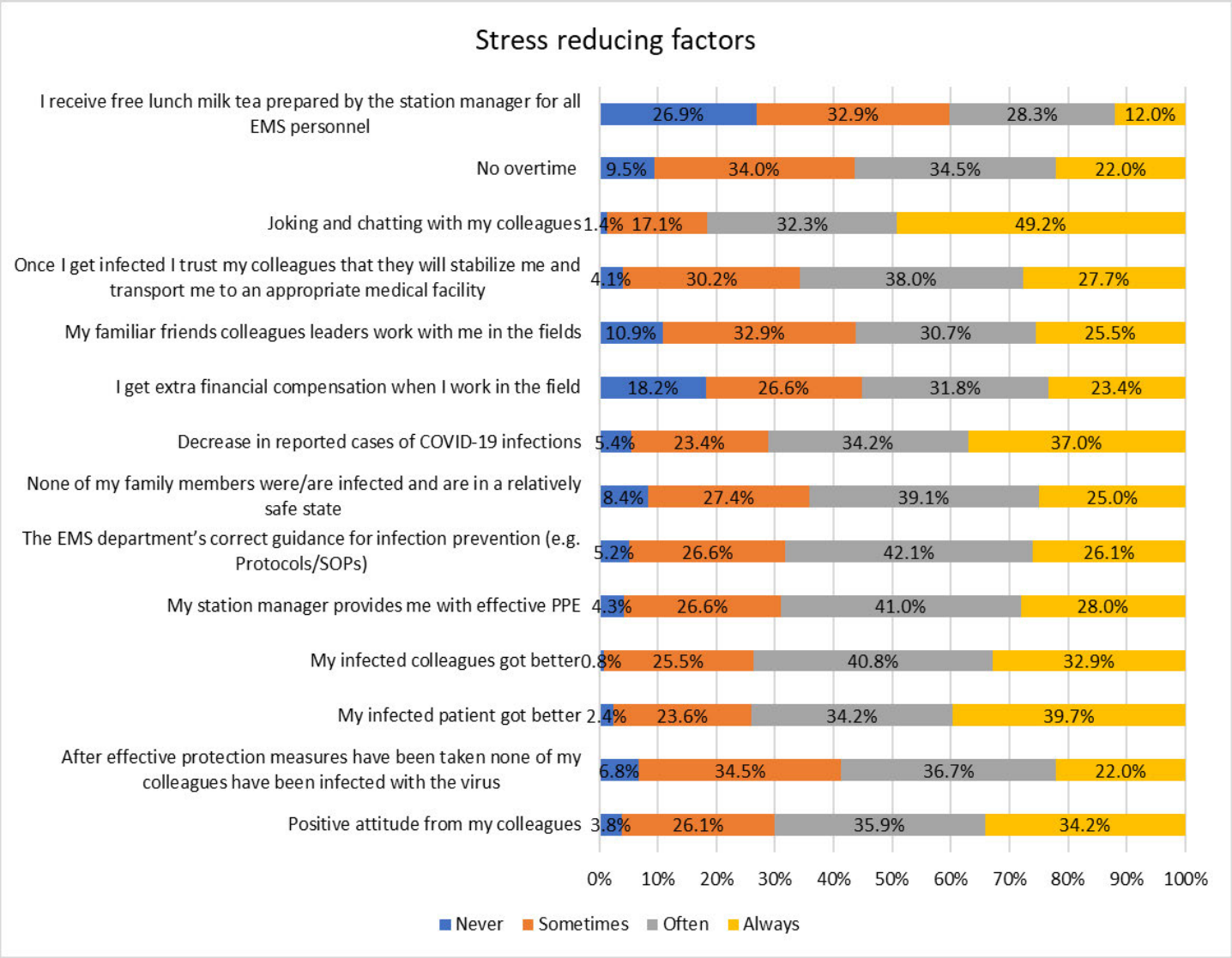

Figure 4.3: Factors that helped to reduce stress during COVID-19

The results (Figure 4.3) indicated that 98.6% (n=360) of the participants felt that joking and chatting with colleagues helped reduce their stress levels. In particular, 49.2% (n=181) of participants always felt relief after joking and talking to colleagues, while 32.3% (n=119) often agreed with the statement. A further 17.1% (n=63) also felt relief after joking and talking to colleagues. Only 1.4% (n=15) of participants felt that talking and chatting to colleagues never reduced their stress levels.

The results showed that 99.2% (n=365) of the participants felt comfort when infected colleagues improved. Specifically, 32.9% (n=121) of participants believed that seeing infected colleagues getting better always reduced their stress levels, while 40.8% (n=150) felt it worked often. A further

25.5% (n=94) felt that seeing a recovered colleague sometimes soothed their stress. Only 0.8% (n=3) believed that seeing a colleague who was once infected get better never relieved their stress.

The majority of participants (97.6%; n=359) felt calm whenever their infected patients regained their health. In particular, 39.7% (n=147) of participants always felt comfort whenever an infected patient improved, while another 34.2% (n=126) often felt comfort whenever they heard the news. A further 23.6% (n=87) only felt comfort sometimes. In contrast, 2.4% (n=9) said that the improvement of an infected patient never reduced their stress.

Most participants (96.2%; n=354) felt that their stress reduced when colleagues expressed positive attitudes. Specifically, 34.4% (n=126) were always comforted by the positive attitudes of colleagues, while 35.9% (n=132) were often comforted by these attitudes, and 26.1% (n=96) were only sometimes comforted. In contrast, 3.8% (n=14) were never comforted by a colleague's positive attitude.

Resilience is the ability of a person to recover swiftly from hardships, and people using positive emotions in difficult situations have been found to be resilient (Padesky and Mooney, 284-285; Miller, 2021: 2). Seeing colleagues or a once infected patient recover gave EMS personnel hope that they could beat the pandemic and come out stronger than before. A study by Giorgi (2020: 11) concluded that the recovery of patients or improvements in their conditions were a positive incentive for nurses. A quantitative study on the experiences of HCWs noted a nurse expressing positive emotions whenever a patient was recovering from infection (Lui *et al.* 2020: 795). These positive emotions felt by EMS personnel whenever a colleague or patient recovers made them resilient.

Most participants (94.6%; n=348) felt relieved whenever they noticed a reduced number of COVID-19-related cases in the media. Specifically, 37.0% (n=136) of participants always felt stress reduction whenever they heard about declining COVID-19 cases, while 34.2% (n=126) often felt relieved by such news. A further 23.4% (n=86) of participants believed that they sometimes felt relieved when hearing about reducing COVID-19 case numbers. However, 5.4% (n=20) never felt comfort when hearing about reducing COVID-19 cases.

The results showed that most (91.6%, n=337) participants believed that knowing their family members were not infected and were relatively safe positively reduced their stress. Specifically, 25.0% (n=92) felt that knowing about the well-being of their family always reduced their stress, while 39.1% (n=144) felt it often did, and 27.4% (n=101) believed it only reduced stress

sometimes. In contrast, 8.4% (n=31) of participants never felt any stress reduction, even after finding out that their family members had not been infected.

Most participants (95.9%; n=353) believed that trusting colleagues to stabilise and transport them to the hospital if infected reduced their stress levels. In particular, 27.7% (n=102) always felt comforted by trusting colleagues to treat and transport them to the hospital if they were infected, while 38.0% (n=140) felt that it often made them feel at ease. A further 30.2% (n=111) only sometimes felt comforted by this assurance. Only 4.1% (n=15) felt that trusting colleagues to take responsibility for them never reduced stress.

Most participants (94.8%; n=349) felt that correct guidance for infection prevention, as given by the EMS department, was comforting and helped reduce their stress levels. Specifically, 26.2% (n=96) always felt stress reduction knowing that their department practiced the correct prevention protocols, while 42.2% (n=155) felt that it often comforted them, and 26.4% (n=97) felt that it only sometimes reduced their stress. In contrast, 5.2% (n=19) felt no stress reduction even after EMS departments employed correct guidance for infection control.

According to Xiang (2020: 228), HCWs reported feeling unprepared and confused when faced with treating COVID-19 patients, especially since equipment guidelines were not yet established. When treating these patients, EMS personnel had feelings of uncertainty and unpreparedness. EMS personnel did not know if they were helping or causing harm when treating COVID-19-infected patients. The development and availability of clinical guidelines reassured HCWs that they were not doing any harm to the patient and the patient would get better if guidelines were followed. Guidelines were developed for patients and HCWs to help them with “self-care” (Lewis *et al.* 2022: 6).

The results showed that most participants (95.7%; n=352) believed that knowing that their station manager provides them with effective PPE reduced their stress. Specifically, 28.0% (n=103) believed it always reduced their stress, while 41.0% (n=151) felt it often lowered their stress. A further 26.6% (n=98) thought it only sometimes reduced their stress. In contrast, 4.3% (n=16) of participants felt that this action by station managers never lowered their stress.

A large number of participants (73.1%; n=269) felt that receiving a free lunch or tea from their station manager added to reducing stress. Specifically, 12.0% (n=44) thought that this practice always reduced their anxiety, while 28.3% (n=104) indicated that it often lowered their stress, and a further 32.9% (n=121) felt that it only sometimes reduced their stress. However, 26.9% (n=99) of participants felt that a free lunch or tea never had any influence on their stress levels.

Most participants (81.8%; n=301) believed that getting extra financial compensation when working helped reduce stress. Specifically, 23.4% (n=86) believed that additional monetary compensation always helped to lower stress, while 31.8% (n=117) believed it helped often, and 26.6% (n=98) believed it only helped sometimes. In contrast, 18.2% (n=66) thought that financial compensation never helped to reduce stress. These findings are in line with Almaghrabi *et al.* (2020: 658), who reported that 85.6% of HCWs believed that providing financial support would increase their professional attitude towards coming to the hospital.

The results further showed that 89.1% (n=328) believed that having family and colleagues who work with them contributed to stress relief. In particular, 25.5% (n=94) believed that this setup always helped to lower their stress, while 30.7% (n=113) felt it often did so, and 32.9% (n=121) felt it only helped sometimes. In contrast, 10.9% (n=40) felt that having family and colleagues who work with them never reduced their stress.

Most participants (90.5%; n=333) felt that not working overtime reduced their stress. In particular, 22.0% (n=81) felt that not working overtime always reduced their anxiety, while 34.5% (n=127) felt that it often lowered their stress, and a further 34.0% (n=125) felt that it sometimes helped with stress reduction. In contrast, 9.5% (n=35) felt that working overtime has no impact on their stress levels.

A large number of participants (93.2%; n=343) believed that a zero-infection rate achieved after implementing adequate protective measures was a stress-reduction factor. Specifically, 22.0% (n=81) felt that such standards and outcomes were always instrumental in reducing their stress levels. A further 36.7% (n=135) felt that it often lowered their stress, and 34.5% (n=127) felt that it sometimes lowered their stress. Only 6.8% (n=25) felt that such measures and outcomes never positively affected their stress levels.

4.3.4 Section E: Personal coping strategies that alleviated my stress

This section discusses the coping mechanisms and/or strategies used by EMS staff in the Eastern Cape during the COVID-19 pandemic. Participants were asked about personal coping strategies used to alleviate stress.

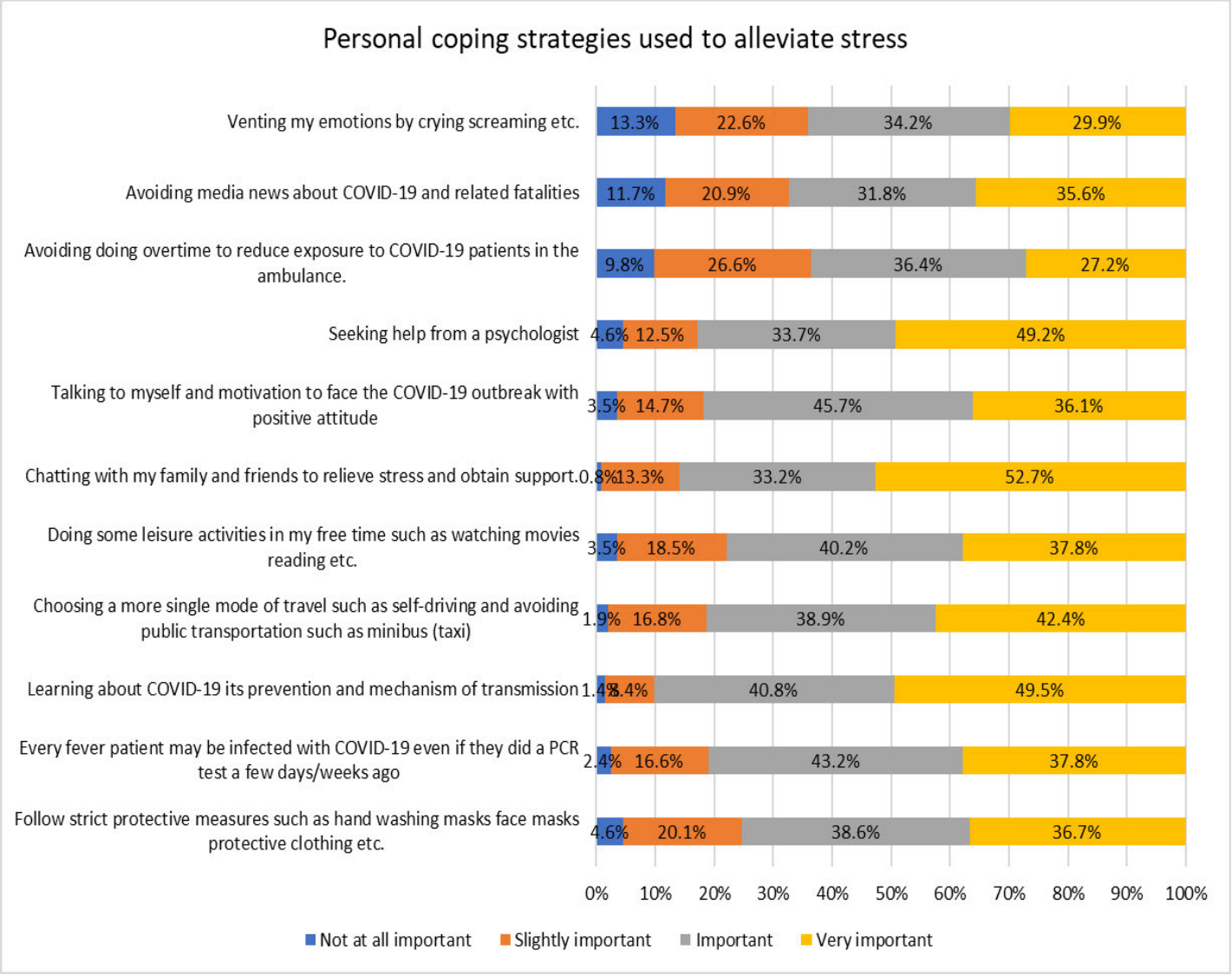

Figure 4.4: Coping strategies used by EMS staff during the COVID-19 Pandemic

The results (Figure 4.4) showed that most participants (97.6%; n=359) felt that being cautious around every fever patient helped them cope, even if they had tested negative a few days or weeks before. In particular, 37.8% (n=139) felt that being cautious was a very important coping mechanism, while 43.2% (n=159) felt it was an important coping mechanism, and 16.6% (n=61)

felt that it was slightly important. Of the participants, 2.4% (n=9) however felt that this was not an important coping mechanism.

Most participants (98.1%; n=361) thought that choosing a single mode of travel, such as self-driving, or avoiding public transport, such as a minibus (taxi), helped them cope. In particular, 42.4% (n=156) believed that such a mode of traveling was very important in assisting them to cope, while 38.9% (n=143) thought it was important, and a further 16.8% (n=62) thought that it was slightly important. Only 1.9% (n=7) thought that this was not an important coping strategy.

A large number of participants (96.5%; n=355) believed that talking positively and motivating themselves was a strategy that helped them cope. In particular, 36.1% (n=133) believed that this was a very important coping strategy, while 45.7% (n=168) believed it was important, and a further 14.7% (n=54) believed it was slightly important. In contrast, 3.5% (n=13) of participants believed that this was unimportant in helping them cope.

The results showed that 95.4% (n=351) of participants thought that seeking help from a psychologist helped them cope. Specifically, 49.2% (n=181) thought that seeking help from a psychologist was very important in assisting them to cope. In comparison, 33.7% (n=124) thought it was important, while 12.5% (n=46) thought that it was slightly important. However, 4.6% (n=17) of participants thought that this was not an important coping mechanism.

Most participants (99.2%; n=365) felt that chatting with family and friends to relieve stress and obtaining support helped them cope. Specifically, 52.7% (n=194) felt that receiving support from family and friends was an important coping strategy, while 33.2% (n=122) felt it was just important, and 13.3% (n=49) felt it was slightly important. Only 0.8% (n=3) felt that this was not an important coping strategy.

According to Fan (2003), as cited by Wu *et al.* (2020:1964), psychological intervention in a crisis situation can help people get out of the crisis as soon as possible and restore psychological balance. HCWs tried to manage/balance their mental health by applying various coping strategies (e.g., talking to themselves, family members or friends, and seeking help from a psychologist). The participants in this study reported higher levels of interest in professional psychological services compared to HCWs in other studies (Cao *et al.* 2020: 257; Guo *et al.* 2020:11-14). HWCs working in hospitals may have free unlimited access to hospital psychologists and did not find them previously helpful. HCWs with in-house psychologists may feel reluctant to share their mental health problems with colleagues. For EMS personnel, this may be the opposite as they

have no free access to a psychologist, no prior experience with professional psychological services and may be eager to try anything that can help them cope with the level of stress they are facing.

In contrast, Kang *et al.* (2020), as cited in Spoorthy (2020: 3), found that nurses showed a more urgent desire to seek the help of psychotherapists and psychiatrists. When comparing participants of the current study on whether they prefer seeking help from a psychologist or talking to friends and family, most participants seemed to prefer the latter. Research showed that several doctors would rather seek help from friends and family than look for psychological/psychiatric consultation (Galbraith, 2020: 2). Previous studies have concluded that seeking help from family and friends is effective in reducing the psychological symptoms of HCWs during the COVID-19 pandemic (Cai *et al.* 2020: 4; Vagni *et al.* 2020: 4).

The results showed that most participants (98.6%; n=362) believed that learning about the COVID-19 virus (e.g., prevention and mechanism of transmission) helped them cope during the pandemic. Specifically, 49.3% (n=181) believed that learning about the virus was a very important coping mechanism, while 40.9% (n=150) believed that it was relatively important, and 8.4% (n=31) believed that it was slightly important. Only 1.4% (n=5) believed that it had no relevance in helping them cope.

A large number of participants (90.2%; n=332) felt that avoiding overtime to reduce exposure to COVID-19 patients helped them cope. Specifically, 27.2% (n=100) felt that avoiding overtime was a very important coping strategy, while 36.4% (n=134) believed that it was relatively important, and 26.6% (n=98) felt that it was slightly important. Of the participants, 9.8% (n=36) however did not believe that avoiding overtime to reduce exposure helped them cope.

The increase in patient volumes and subsequent increase in workload had a negative impact on the mental and physical health of EMS personnel.

Most participants (86.7%; n=319) felt that venting emotions by crying or screaming helped them cope. Of the participants, 29.9% (n=110) felt that venting emotions always helped them cope, while 34.2% (n=126) felt that it was of relative importance, and a further 22.6% (n=83) felt that it slightly helped them cope. Of the participants, 13.3% (n=49) felt that venting emotions did not help them cope with stress.

The results showed that most participants (88.3%; n=325) coped by avoiding news about COVID-19 related deaths in the media. In particular, 35.6% (n=131) felt that avoiding news related to

COVID-19 was very important in helping them cope, while 31.8% (n=117) felt that it was relatively important, and 20.9% (n=77) felt that it was slightly important. However, 11.7% (n=43) felt that avoiding news related to COVID-19 in the media was not important in helping them cope. Munawar (2020: 289) reported that one of the significant stress elements was prolonged exposure to the news and social media. The number of deaths, new cases and infection rate created panic amongst HCWs, including unreliable sources of breaking news related to the COVID-19 pandemic.

Most participants (95.4%; n=351) believed they coped by following strict protective measures, such as hand washing and wearing PPE. In particular, 36.7% (n=135) believed that following stringent protective measures always helped them cope, while 38.6% (n=142) believed that it was important, and 20.1% (n=74) believed that it was slightly important to follow these measures. However, 4.6% (n=17) believed that it was not important in helping them cope.

Most participants (96.5%; n=355) felt that they coped by enjoying leisure activities, such as watching movies. Specifically, 37.8% (n=139) felt that enjoying leisure activities was very important in helping them cope, while 40.2% (n=148) felt that these activities were important, and a further 18.5% (n=68) felt that these activities were only slightly important. In contrast, 3.5% (n=13) felt that enjoying leisure activities was not important in helping them cope.

A large number of participants (98.6%; n=363) felt that learning about COVID-19 prevention and the mechanism of transmission helped them cope. Of the participants, 49.5% (n=182) felt that learning about COVID-19 prevention and mechanisms of transmission was a very important coping mechanism; 40.8 (n=150) felt that it was slightly important; and 8.4% (n=31) felt that it was slightly important. Only 1.4% (n=5) felt that learning about COVID-19 and its transmission mechanism was not an important coping strategy. Previous research focusing on COVID-19 also reported that learning about prevention and treatment was an effective coping mechanism to reduce stress (Zhou, 2021: 4). This gives EMS personnel a sense of control, knowing how to protect themselves against the virus and appropriate protocols on how to use PPE.

4.3.5 Section F: Motivational factors that encourage the continuation of work during future pandemics

This section identified the mechanisms/strategies that could help the researcher to make recommendations on providing support and improving the work conditions of EMS personnel in the Eastern Cape. The main motivational factor was family support, which was indicated by a significant number of workers, followed by effective treatment of the disease and the vaccination process.

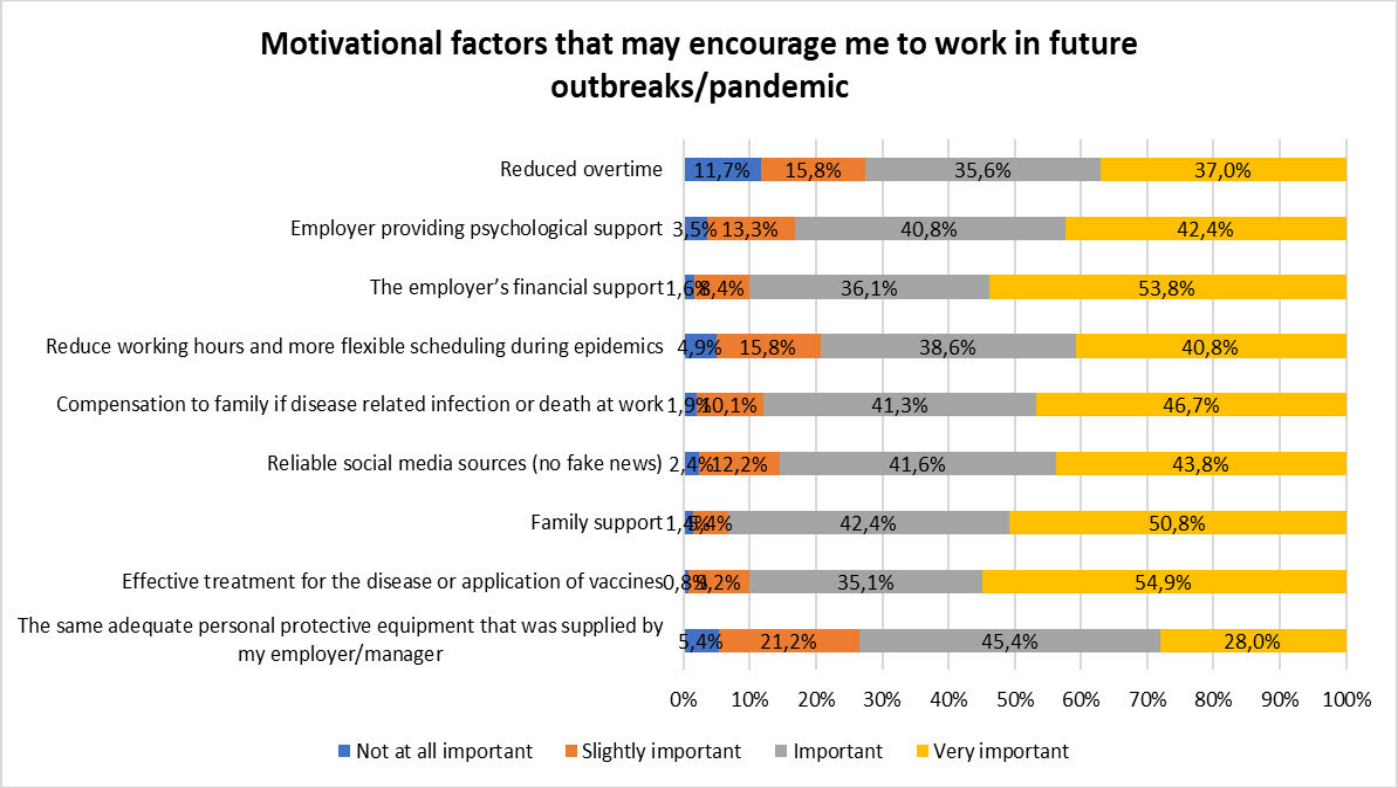

Figure 4.5: **Factors that motivate EMS personnel to work in future pandemics**

The results (Figure 4.5) indicated that 88.3% (n=325) of the participants were encouraged to work in future pandemics or epidemics if they could work less overtime. Specifically, the reduction of overtime was a very important motivational factor for 37.0% (n=136) of the participants. In comparison, 35.6% (n=131) felt that it was an important factor, while 15.8% (n=58) thought that it was a slightly important factor. Of the participants, 11.7% (n=43) however felt that reducing overtime was not an important motivational factor.

Most participants (94.6%; n=348) thought that the supply of adequate PPE by the employer was a motivational factor to work in future outbreaks and/or pandemics. Specifically, 28.0% (n=103)

felt that a good supply of PPE was a very important motivational factor; 45.4% (n=167) felt that it was an important factor; and 21.2% (n=78) felt that it was a slightly important factor. Only 5.4% (n=20) felt that it was not an important factor.

A total of 53.8% (n=198) felt that financial support from the employer was a very important motivational factor, 36.1% (n=133) felt that it was important, and 8.4% (n=31) felt that it was a slightly important factor. A mere 1.6% (n=6) felt that it was not an important factor at all.

A large number of participants (98.1%; n=361) felt that compensation to their family if they would become infected or died while on duty would be an encouraging factor to work in future pandemics. In particular, 46.7% (n=172) felt that their family receiving compensation should something happen (infection or death) to them was a very important motivational factor; 41.3% (n=152) felt that it was important; and 10.1% (n=37) felt that it was a slightly important factor. A mere 1.9% (n=7) felt that this was not an important factor at all.

Most participants (98.4%; n=362) thought that receiving financial support from the employer would be an encouraging factor in order to work in future pandemics. In particular, 53.8% (n=198) felt that financial support from the employer was a very important motivational factor, 36.1% (n=133) felt that it was important, and 8.4% (n=31) felt that it was a slightly important factor. A mere 1.6% (n=6) felt that it was not an important factor at all.

The results showed that most participants (95.1%; n=350) felt that reduced working hours and a more flexible schedule would encourage them to work in future pandemics. Specifically, 40.8% (n=150) believed that reduced overtime and a flexible schedule were very important motivational factors; 38.6% (n=142) believed that these were important factors; and 15.8% (n=58) believed that these were slightly important factors. However, 4.9% (n=18) believed that reduced working hours and a more flexible schedule were not important motivational factors.

Most participants (96.5%; 355) believed that psychological services provided by the employer would encourage them to work in future pandemics. Specifically, 42.4% (n=156) believed that the availability of psychological services was a very important motivational factor; 40.8% (n=150) believed that it was an important factor; and 13.3% (n=49) believed that it was a slightly important factor. Of the participants, 3.5% (n=13) believed that this was not at all an important factor.

Most participants (97.6%; n=359) thought that reliable social media sources (e.g. no fake news) would encourage them to work in future pandemics. In particular, 43.8% (n=161) thought that having reliable social media sources was a very important motivational factor, whilst 41.6%

(n=153) thought that it was an important factor, and 12.2% (n=45) thought that it was a slightly important factor. Only 2.4% (n=9) did not consider this as an important factor motivating them to work in future pandemics.

Most participants (99.2%; 364) believed that the effective treatment of the disease or vaccine application would motivate them to work in future pandemics. Specifically, 54.8% (n=201) believed that having a vaccine was a very important motivational factor, 35.1% (n=129) believed it was important, and 9.3% believed that it was a slightly important motivational factor. Of the participants, only 0.8% (n=3) believed it was not at all an important factor.

A large number of participants (98.6%; n=363) felt that having family support would motivate them to work in future pandemics. Specifically, 50.8% (n=187) felt that having family support was a very important motivational factor; 42.4% (n=156) felt that it was an important factor; and 5.4% (n=20) felt that it was a slightly important factor. A mere 1.4% (n=5) felt that it was not at all an important factor.

During the SARS and influenza pandemics, studies noted that EMS personnel and other HCWs were willing to report to work, provided that there was adequate PPE (protection) and proper monetary compensation (Khan and Systems, 2015: 61; Watt *et al.* 2010: 18). Following the preceding, literature reports on the motivation of EMS personnel demonstrated that their willingness to participate in the pandemic or subsequent outbreaks was motivated by receiving adequate protective services for themselves and their family members (Parversh-Masoud *et al.* 2021: 1122-1123). In line with the current study, EMS personnel presumed to work during a pandemic were found to be intensely dependent on the availability of PPE, an opportunity for vaccination, and the protection of family members (Dreher *et al.* 2021: 2; Cash *et al.* 2021: 5). Financial compensation will help EMS personnel take care of their families while they are on duty or in the unfortunate event they die in the line of duty.

4.4 Descriptive statistics

Table 4.2 indicates that the participants generally rated (mean score=2; *slight feeling*) most of the aspects in this sub-scale of attitudes lowly, suggesting that the working conditions may not have been ideal. Participants tried to avoid those who were symptomatic and/or affected by COVID-19.

Table 4.2: Attitudes of EMS personnel working during the COVID-19 Pandemic

Section B: My feelings during the COVID-19 outbreak	Mean	Std. Deviation	Skewness
I think EMS personnel who have not been exposed to COVID-19 should reduce their contact with me	2.16	1.120	-0.309
I want to stop working at my current job	2.19	1.005	-0.026
I feel angry because I get dispatched to more COVID-19-related cases than my colleagues	2.21	1.039	0.153
I have been off work at least once since the start of the pandemic	2.24	1.048	-0.311
Whenever I have to go to work, I want to call in sick	2.27	1.129	-0.752
If the epidemic suddenly gets worse, I will have to quit my job	2.31	1.084	-0.395
I want to work in an ambulance that doesn't deal with COVID-19 patients	2.31	1.092	0.336
I was unhappy about working overtime during the pandemic	2.38	1.069	0.362
Whenever I work in the ambulance, I feel frightened and nervous	2.48	1.071	0.141
I have noticed that my colleagues sometimes avoid sitting at the back of the ambulance with the patient if they think the patient may be infected	2.51	1.044	-0.015
I think that my EMS job comes from a social and moral responsibility (my job is a calling)	2.74	1.127	0.161
I expect recognition for my work from the EMS management team	2.77	1.020	0.241
I try to reduce exposure to patients who are suspected or confirmed with COVID-19	2.79	1.056	0.209

Note: 1=Not at all, 2=Slightly, 3=Moderately, 4=Very much

Three top-rated factors

In this sub-section, the top-3-rated feelings during the COVID-19 outbreak are discussed. The participants felt that they tried to reduce exposure to patients who were suspected of having COVID-19 or who were confirmed COVID-19 cases (M=2.79). Secondly, they expected recognition for their work from their management team (M=2.77); and thirdly, their EMS job came from a social and moral responsibility ('my job is a calling') (M=2.74). They generally rated these aspects as moderately affecting their feelings regarding the COVID-19 pandemic.

Three least-rated factors

The participants felt that some factors did not matter in terms of how they influenced their perception of the COVID-19 pandemic. They 'least' felt that EMS personnel not exposed to

COVID-19 should reduce their contact with them (M=2.16). They also did not feel that they would want to stop working at their current job (M=2.19). Lastly, some also reported that they felt angry because they were dispatched to more COVID-19-related cases than their colleagues (M=2.21).

Table 4.3: Factors that cause stress amongst EMS personnel

Section C: Factors that caused me stress during the COVID-19 pandemic	Mean	Std. Deviation	Skewness
I was infected by an infected patient while I was at work	2.62	1.081	-0.214
I often feel weak and contradictory between my responsibility and life safety	2.69	0.996	-0.235
Being assigned to work on a COVID-19 dedicated ambulance	2.75	1.019	-0.400
When I see my colleagues' showing symptoms of infections	2.80	0.951	-0.250
Constantly screening myself for infection	2.82	0.977	-0.328
Media reports on the number of new cases every day	2.86	0.992	-0.377
I don't know when the pandemic will be contained	2.86	0.981	-0.435
Often faced with a lack of more EMS personnel medical equipment (e.g. gloves) medical resources (e.g. ambulances)	2.89	0.940	-0.389
Seeing an infected patient die in front of me	2.90	1.010	-0.447
When I have some respiratory symptoms of the infection I worried if I am infected	2.94	0.968	-0.484
I think the current protective measures are still lacking	2.96	0.914	-0.523
Feeling exhausted most of the time	2.96	0.850	-0.622
Seeing my colleagues were infected	2.97	0.909	-0.573
Every day staying in PPE for a long amount of time	2.97	0.939	-0.554
Taking care of my infected colleagues	3.04	0.897	-0.686
I am/was worried about infecting my family	3.11	0.941	-0.584
Small mistakes can make me, or others infected	3.13	0.908	-0.662
Lack of specific treatment for COVID-19	3.15	0.823	-0.696
Seeing stress or fear from my colleagues	*3.16*	*0.859*	*-0.853*

Note: 1=Not at all, 2=Slightly, 3=Moderately, 4=Very much

In general, the participants rated most aspects in this section as moderate stress-causing factors. They felt that most of these factors caused them a relative amount of stress during the COVID-19 pandemic.

Three top-rated factors

Participants strongly felt that small mistakes could cause them or others to become infected (M=3.13); that at the time of the survey, there was a lack of specific treatment for COVID-19 (M=3.15); and that they saw stress or fear in their colleagues (M=3.16).

Three least-rated factors

The participants slightly to moderately felt that an infected patient could infect them while at work (M=2.62); they often felt weak and in a quandary between their responsibility and life safety (M=2.69); and they were unhappy when assigned to work on a COVID-19-dedicated ambulance (M=2.75).

Table 4.4: Factors that reduced stress amongst EMS personnel

Section D: Factors that helped to reduce my stress during the COVID-19 pandemic	Mean	Std. Deviation	Skewness
I receive free lunch milk tea prepared by the station manager for all EMS personnel	2.26	0.983	0.227
I get extra financial compensation when I work in the field	2.61	1.037	-0.135
No overtime	2.69	0.923	-0.085
My familiar friends, colleagues, and leaders work with me in the fields	2.71	0.969	-0.112
After effective protection measures have been taken none of my colleagues have been infected with the virus	2.74	0.878	-0.073
None of my family members were/are infected and are in a relatively safe state	2.81	0.909	-0.287
Once I get infected, I trust my colleagues that they will stabilize me and transport me to an appropriate medical facility	2.89	0.859	-0.184
The EMS department's correct guidance for infection prevention (e.g., Protocols/SOPs)	2.89	0.851	-0.304
My station manager provides me with effective PPE	2.92	0.855	-0.304
Positive attitude from my colleagues	3.01	0.873	-0.359
Decrease in reported cases of COVID-19 infections	3.03	0.909	-0.494
My infected colleagues got better	3.05	0.787	-0.200
My infected patient got better	3.11	0.849	-0.464
Joking and chatting with my colleagues	3.29	0.797	-0.733

Note: 1=Not at all, 2=Slightly, 3=Moderately, 4=Very much

Three top-rated factors

Three top-rated factors were reported by participants, which helped to reduce their stress during the COVID-19 pandemic. Firstly, they strongly felt that their colleagues became infected but that their health also improved again (M=3.05). Secondly, they strongly felt that infected patients regained their health (M=3.11); and thirdly, they liked joking and chatting with their colleagues (M=3.29).

Three least-rated factors

Participants felt that the following factors least reduced stress during the COVID-19 pandemic: They did not feel that they received adequate free lunch, milk and/or tea (M=2.26); They did not get extra financial compensation when working in the field (M=2.61); and They did not receive payment for working overtime (M=2.69).

Table 4.5: Coping strategies used by EMS personnel

Section E: Personal coping strategies I used to alleviate stress	Mean	Std. Deviation	Skewness
Venting my emotions by crying screaming etc.	2.80	1.012	-0.379
Avoiding doing overtime to reduce exposure to COVID-19 patients in the ambulance.	2.81	0.948	-0.308
Avoiding media news about COVID-19 and related fatalities	2.91	1.013	-0.496
Follow strict protective measures such as hand washing masks face masks protective clothing etc.	3.07	0.866	-0.573
Doing some leisure activities in my free time such as watching movies reading etc.	3.12	0.830	-0.609
Talking to myself and motivation to face the COVID-19 outbreak with a positive attitude	3.14	0.794	-0.690
Every fever patient may be infected with COVID-19 even if they did a PCR test a few days/weeks ago	3.16	0.786	-0.602
Choosing a more single mode of travel such as self-driving and avoiding public transportation such as minibus (taxi)	3.22	0.789	-0.636
Seeking help from a psychologist	3.27	0.854	-1.004
Chatting with my family and friends to relieve stress and obtain support.	3.38	0.744	-0.861
Learning about COVID-19 its prevention and the mechanism of transmission	*3.38*	*0.699*	*-0.925*

Note: 1=Not at all, 2=Slightly, 3=Moderately, 4=Very much

Three top-rated factors

Participants perceived three important factors as personal coping strategies used to alleviate stress. They strongly believed in seeking help from a psychologist (M=3.27); chatting with their family and friends to relieve stress and obtain support (M=3.38); and learning about COVID-19 prevention and its mechanism of transmission (M=3.38).

Three least-rated factors

Participants did not feel that venting their emotions by crying, screaming, etc. (M=2.80) was a way of coping with COVID-19 working conditions. They also did not feel that avoiding working overtime to reduce exposure to COVID-19 patients in the ambulance was helping them cope (M=2.81). Lastly, avoiding news about COVID-19 and COVID-related deaths (M=2.91) was for some a personal coping strategy to alleviate stress.

Table 4.6: Factors that will motivate EMS personnel to work in future pandemics/outbreaks

Section F: Motivational factors that may encourage me to work in future outbreaks/pandemic	Mean	Std. Deviation	Skewness
The same adequate personal protective equipment that was supplied by my employer/manager	2.96	0.843	-0.472
Effective treatment for the disease or application of vaccines	3.44	0.694	-0.986
Family support	3.43	0.661	-1.017
Reliable social media sources (no fake news)	3.27	0.768	-0.824
Compensation to the family if disease-related infection or death at work	3.33	0.733	-0.895
Reduce working hours and more flexible scheduling during epidemics	3.15	0.860	-0.763
The employer's financial support	3.42	0.716	-1.087
Employer providing psychological support	3.22	0.807	-0.824
Reduced overtime	2.98	0.998	-0.667

Note: 1=Not at all, 2=Slightly, 3=Moderately, 4=Very much

Three top-rated factors

The three top-rated motivational factors that would encourage participants to work in future pandemics were an effective treatment for the disease or application of vaccines (M=3.44); family support (M=3.43); and the employer's financial support (M=3.42).

There were no least-rated aspects in this regard. However, on a relative scale, participants reported that inadequate PPE (M=2.96) and increased overtime (M=2.98) could be potential demotivational factors to work in future pandemics.

4.5 Reliability

When using Likert-type scales, it is imperative to calculate and report Cronbach's alpha coefficient for internal consistency reliability for any scales or sub-scales one may be using. The data analysis must then use these summated scales or sub-scales, not individual items.

Gliem and Gliem (2003) indicate that Cronbach's alpha reliability coefficient normally ranges between 0 and 1. However, there is no lower limit to the coefficient. The closer the Cronbach's alpha coefficient is to 1.0, the greater the internal consistency of the items in the scale. Based on the formula, rk / [1 + (k -1) r], where **k** is the number of items considered and r is the mean of the inter-item correlations, the number of items in the scale and the mean inter-item correlations determine the alpha size. Table 4.7 provides reliable results for the summated scales described in the earlier section.

4.6 Sub-scales

The questions were arranged and grouped into five (5) categories: Attitudes, psychological stressors, stress-reducing factors, coping strategies, and motivation to work in future pandemics. This study used the 4-point Likert scale parameters for each category, which were represented by four (4) responses, namely: Never/not at all, sometimes/slightly important/slight, often/important/moderate, and always/very important/very important. As with any Likert-type scale, the sub-scales were created by summing the individual scores and obtaining the average. Normality tests were performed on these aggregate scales which informs which statistical methods/test to be used because some methods assume the data to be normally distributed.

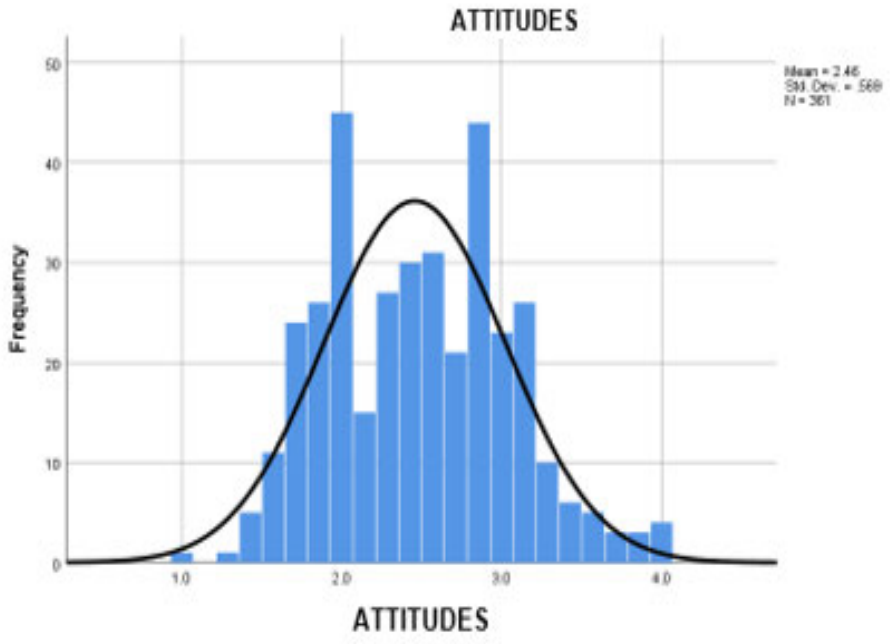

Figure 4.6: Attitudes that intensified working stress

The above figure (Figure 4.6) indicates that attitudes amongst EMS personnel during the COVID-19 pandemic were generally not ideal, as the mean score was 2.5 (standard deviation=0.57), which was interpreted as slightly negative feelings during the COVID-19 pandemic. The data is normally distributed, as shown by the bell shape, which conforms to the normality assumption for the methods used.

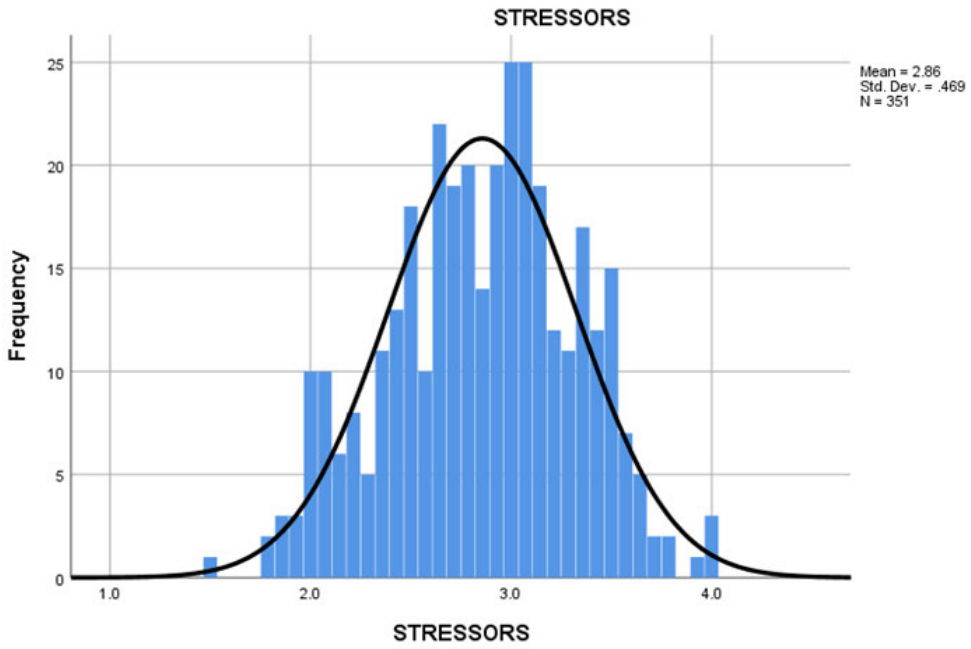

Figure 4.7: Psychological stressors

The above figure (Figure 4.7) indicates that the "psychological stressors during the COVID-19 pandemic" sub-scale was moderately scored (M=2.9~3), which suggests moderate perceptions towards factors in this sub-scale. The data are normally distributed, as depicted by the bell shape.

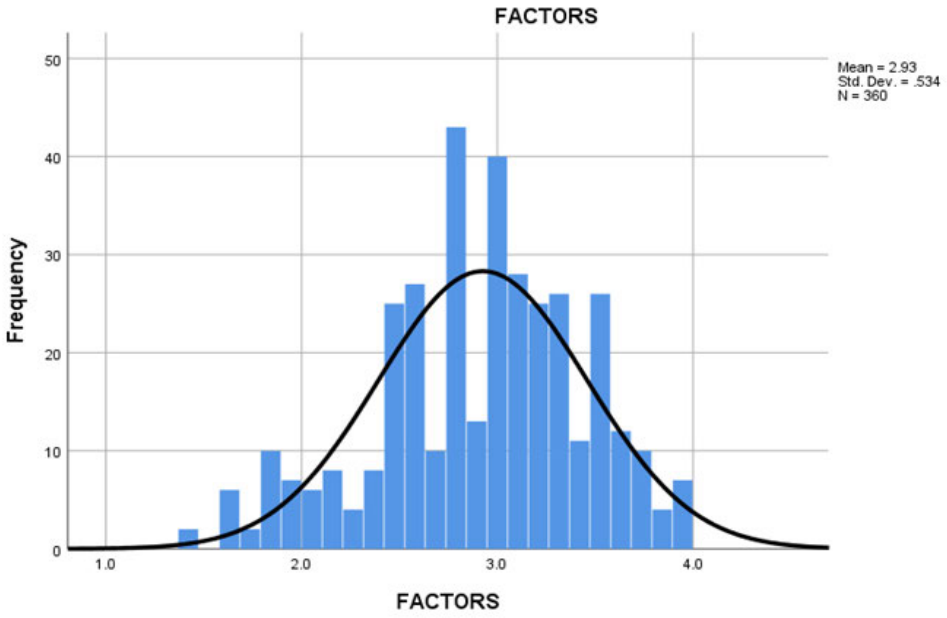

Figure 4.8: Stress-reducing factors

Figure 4.8 above shows that the 'factors that reduce stress amongst EMS personnel' sub-scale was moderately scored (M=2.9~3), which suggests moderate perceptions towards factors in this scale. The bell shape suggests that the data were normally distributed, which is ideal for inferential statistics.

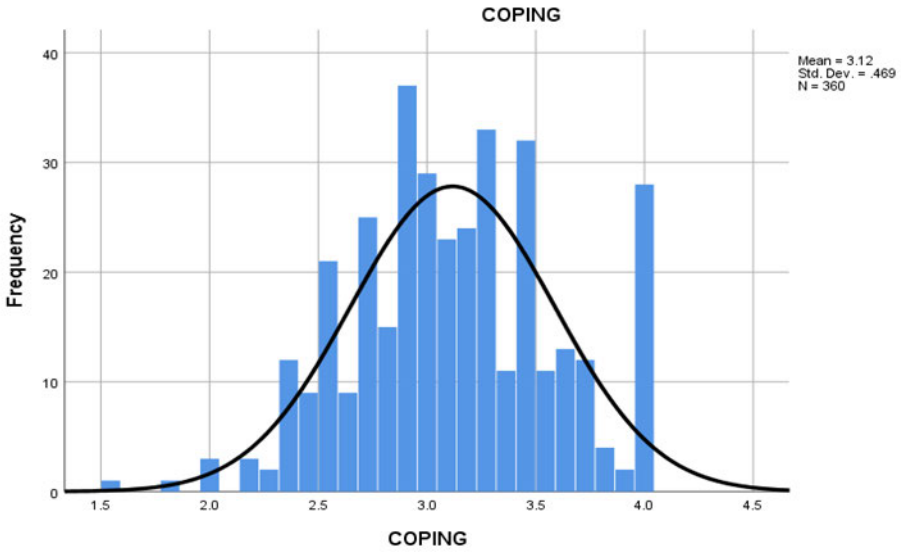

Figure 4.11: Coping strategies used by workers during the COVID-19 pandemic

The above figure (4.9) shows that the “coping mechanisms/strategies” sub-scale was moderately scored (M=3.2), which suggests stronger moderate perceptions towards factors in this sub-scale. The data is normally distributed, as depicted by the bell shape.

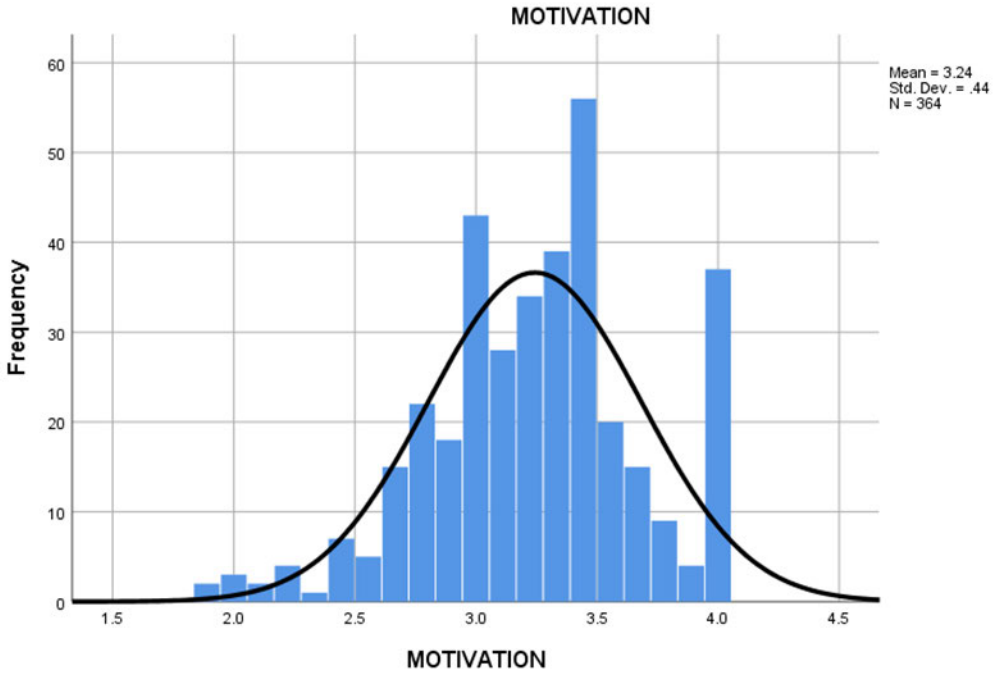

Figure 4.15: Factors that will motivate EMS personnel during future pandemics

Figure 4.10 indicates the ‘motivational factors that may encourage EMS personnel to work in future pandemics. The sub-scale was moderately scored (M=3.2), which suggests stronger perceptions towards factors in this sub-scale than in Figure 4.7. The data were normally distributed, which is ideal for inferential statistics. In summary, all the sub-scale data were

normally distributed and were not heavily skewed either left or right, which is an ideal prerequisite for the correlation and regression models.

Table 4.7: Cronbach's alpha reliability coefficient ranges

Item-total statistics					
	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Squared multiple correlation	**Cronbach's alpha if item deleted**
ATTITUDES	12.150	1.569	.383	.272	**.745**
FACTORS	11.669	1.388	.611	.381	**.790**
STRESSORS	11.750	2.087	.098	.082	**.674**
COPING	11.495	1.583	.530	.296	**.767**
MOTIVATION	11.363	1.954	.237	.140	**.811**

George and Mallery (2003: 231) provide the following rules of thumb:

- "_ > .9 – Excellent;
- > .8 – Good;
- >.7 – Acceptable;
- >.6 – Questionable;
- >.5 – Poor; and
- < .5 – Unacceptable"

The results for all the scales are within an acceptable range. This means that the items in the scales measured what they were intended to measure (Chant *et al.* 2020,3). These results are good for the regression models.

4.7 Pairwise correlations

Table 4.8 provides the results of associations between the dependent and independent variables. The larger the absolute value of the coefficient (the size of the number without regard to the sign), the greater the magnitude of the relationship. It is standard practice to use the coefficient p-values to decide whether to include variables in the final model (Schober *et al.* 2018: 1763-1768).

Table 4.8: Association between the dependent and independent variables

		MOTIVATION	ATTITUDES	FACTORS	STRESSORS	COPING
MOTIVATION	Pearson correlation	1	0.077	.260**	-0.084	.293**
	Sig. (2-tailed)		0.148	0.000	0.117	0.000
	N	364	357	357	348	357
ATTITUDES	Pearson correlation	0.077	1	.470**	0.008	.372**
	Sig. (2-tailed)	0.148		0.000	0.888	0.000
	N	357	361	355	346	354
FACTORS	Pearson correlation	.260**	.470**	1	.209**	.474**
	Sig. (2-tailed)	0.000	0.000		0.000	0.000
	N	357	355	360	344	353
STRESSORS	Pearson correlation	-0.084	0.008	.209**	1	.133*
	Sig. (2-tailed)	0.117	0.888	0.000		0.013
	N	348	346	344	351	346
COPING	Pearson correlation	.293**	.372**	.474**	.133*	1
	Sig. (2-tailed)	0.000	0,000	0.000	0.013	
	N	357	354	353	346	360
Gender	Pearson correlation	.173**	-.123*	0.094	-0.063	0.099
	Sig. (2-tailed)	0.001	0.020	0.074	0.243	0.063
	N	362	358	358	349	358
Age category	Pearson correlation	0.012	.110*	0.084	0.028	0.062
	Sig. (2-tailed)	0.815	0.037	0.113	0.596	0.241
	N	364	360	360	351	360
Do you have kids	Pearson correlation	0.091	0.004	0.037	0.068	-0.031

	Sig. (2-tailed)	0.082	0.939	0.480	0.201	0.560
	N	363	359	359	350	359
Smoking status	Pearson correlation	0.022	-0.095	-0.006	0.073	0.007
	Sig. (2-tailed)	0.679	0.071	0.903	0.174	0.901
	N	364	360	360	351	360
Medical condition	Pearson correlation	0.019	0.058	-0.038	-0.044	0.008
	Sig. (2-tailed)	0.725	0.276	0.470	0.412	0.874
	N	363	360	359	350	359
Years within EMS	Pearson correlation	-0.096	0.030	-0.019	-0.074	-0.014
	Sig. (2-tailed)	0.069	0.565	0.716	0.166	0.799
	N	362	359	358	349	358
Organization	Pearson correlation	0.023	-.103*	0.025	0.035	-.149**
	Sig. (2-tailed)	0.663	0.050	0.639	0.510	0.005
	N	364	361	360	351	360
District/Metropolitan	Pearson correlation	-0.026	-0.015	0.022	-0.094	-0.059
	Sig. (2-tailed)	0.620	0.782	0.676	0.082	0.270
	N	357	354	354	345	353
Area of specialty	Pearson correlation	-0.025	-.180**	-0.041	-0.051	-0.084
	Sig. (2-tailed)	0.637	0.001	0.438	0.341	0.111
	N	361	358	357	349	357

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

**. Correlation is significant at the 0.05 level (2-tailed).*

Motivation to work in future pandemics was positively associated with factors that reduce stress ($r=0.260$, $p < 0.05$), suggesting that a unit improvement in motivation was likely to raise the expectations of reducing stress amongst EMS personnel. Motivation to work in future pandemics was positively associated with coping mechanisms and/or strategies used by EMS personnel during the COVID-19 pandemic ($r=0.293$, $p < 0.05$), suggesting that a unit improvement in motivation was likely to improve coping mechanisms/strategies used by EMS personnel during the COVID-19 pandemic motivation was not associated with working conditions and psychological

stressors amongst EMS personnel during the COVID-19 pandemic. Gender was the only demographic associated with motivation as male participants were less likely to be less motivated than female participants.

Attitudes were positively associated with factors that reduce stress amongst EMS personnel ($r=0.47$, $p < 0.05$), with moderate correlation. The results suggest that a unit improvement in reducing stress was likely to improve attitudes amongst EMS personnel. Attitudes were also positively associated with coping strategies amongst EMS personnel ($r=0.37$, $p < 0.05$), with a moderate correlation. The results suggest that unit-improvement coping strategies were likely to improve attitudes. Gender ($r=-0.123$), organisation ($r=-0.103$, $p < 0.05$) and area of specialty ($r=-0.180$, $p < 0.05$) were negatively associated with attitudes, and male participants and older age groups were less likely to express satisfaction with working conditions than female participants and younger age groups.

On the other hand, factors that reduce stress amongst EMS personnel were positively associated with motivation ($r=0.26$, $p < 0.05$), working conditions ($r=0.47$, $p < 0.05$), psychological stressors ($r=0.209$, $p < 0.05$), and coping strategies ($r=0.47$). A unit improvement in factors that reduce psychological stress was likely to improve the other three factors. Psychological stressors were weakly associated with STRESS-reducing factors ($r=0.21$, $p < 0.05$) and coping strategies ($r=0.13$, $p < 0.05$), and not associated with motivation and working conditions. Coping strategies were positively associated with all other factors. In summary, it appears that all associations between the factors in this study were positive, thus an improvement in one was likely to improve the other. However, associations are not relationships, and there is no causal link.

4.8 Multivariate regression

The following section provides the results of the regression analysis. As described in the methodology section (Chapter 3), the beta-coefficients provide the strength of the relationship, while $P > t$ represents the significance level (Maree, 2016: 269).

Table 4.9 presents the results for multivariate regression. The factors, stressors, coping and motivation scales are the predictors of attitudes, and the demographic factors are the confounding factors that could also influence support and the improvement of working conditions of EMS personnel in times of pandemics.

Table 4.9: Multivariate regression factors associated with the psycho-social influence of working during the COVID-19 pandemic in the Eastern Cape

ATTITUDES	Coef,	Std, Err,	t	P>t	[95%]	Interval]
FACTORS (Never)						
Sometimes	0.120	0.331	0.360	0.717	-0.531	0.772
Often	0.487	0.329	1.480	0.141	-0.162	1.135
Always	0.699	0.336	2.080	*0.038	0.038	1.361
STRESSORS (slightly)						
Moderate	-0.015	0.070	-0.210	0.834	-0.153	0.123
Very much	-0.074	0.106	-0.690	0.488	-0.282	0.135
COPING (slightly important)						
Important	0.040	0.095	0.420	0.672	-0.147	0.228
Very important	0.213	0.114	1.870	** 0.063	-0.011	0.437
MOTIVATION (slightly)						
Important	0.105	0.113	0.930	0.356	- 0.118	0.328
Very important	0.091	0.124	0.730	0.465	- 0.153	0.335
Gender						
F	-0.146	0.059	-2.460	*0.015	-0.263	-0.029
Age (35 years above)	0.108	0.067	1.600	0.110	-0.024	0.241
Do you have kids						
Yes, but they do not live with me	0.070	0.058	1.200	0.232	-0.045	0.184
No	0.002	0.075	0.020	0.983	-0.147	0.150
Smoking status *(Current smoker)*						
Non-smoker	-0.022	0.057	-0.390	0.699	-0.135	0.091
Ex-smoker	-0.253	0.091	-2.770	*0.006	-0.432	-0.074
Any known medical condition						
Asthma/COPD	0.057	0.081	0.700	0.481	-0.102	0.217
Heart disease	0.060	0.085	0.710	0.481	-0.107	0.227
Diabetes mellitus	0.159	0.087	1.820	** 0.070	-0.013	0.330
Other	0.024	0.075	0.320	0.753	-0.124	0.171
Years						
Yes	-0.028	0.063	-0.440	0.659	-0.153	0.097
No	-0.195	0.105	-1.850	**0.065	-0.402	0.012

Organization *(Public)*						
Private sector	-0.106	0.073	-1.450	0.147	-0.249	0.037
Current area of specialty						
Academic	-0.219	0.077	-2.850	0.005	-0.371	-0.068
Management	-0.128	0.087	-1.470	0.142	-0.300	0.043
_cons	-0.097	0.357	-0.270	0.786	-0.801	0.606

*Note: *Significant at 5% level*

Predictors of attitudes

The results show that factors that reduce stress amongst EMS personnel were positively related to attitudes amongst EMS personnel within the context of the COVID-19 pandemic, as the results are significant at a 10% level ($p < 0.1$), which indicates weak evidence. These results suggest that a unit in stress reduction was likely to improve the feelings of working conditions in times of the COVID-19 pandemic by as much as 74%.

The results show that coping mechanisms and/or strategies used by EMS personnel during the COVID-19 pandemic were positively related to attitudes, with weak results significant at a 5% level ($p < 0.1$). These results suggest that a unit measurement in coping strategies was likely to improve attitudes in times of COVID-19 by as much as 21%. The implication of these results is discussed in the ensuing chapter, Chapter 5.

The model performed well and managed to show the relationship between the variables and the significance of the relationships. The model in the regression analysis shows that:

Coefficients: All coefficients except for stressors, gender, smoking status and years are greater than zero. This implies that all variables greater than zero have an influence on the psychosocial wellbeing of EMS personnel.

t-value: Except for gender, smoking status and years, t-value for all coefficients are significantly above zero. This implies that gender, smoking status and years in the sector may not have an influence on the psychosocial wellbeing of EMS personnel working during COVID-19.

Not significant but worth discussing

The results show that psychological stressors amongst EMS personnel during the COVID-19 pandemic were not significantly related to the attitudes of EMS personnel within the context of the COVID-19 pandemic, as the results are not significant at 5% and 10% levels. Although the results

are not significant, they provide insights that a unit decrease in stress ($p > 0.05$) was likely to improve the feelings of working conditions in times of COVID-19.

The results show that motivational factors that encourage EMS personnel to work in future outbreaks or pandemics were not significantly related to attitudes within the context of the COVID-19 pandemic, as the results are not significant at the 5% and 10% levels. Although the results are not significant, they provide insights that a unit increase or improvement ($p > 0.05$) in motivation was likely to improve the feelings of working conditions in times of COVID-19 or another pandemic. Further results indicate that diabetes ($p < 0.065$) and years in the current position also affected attitudes.

4.9 Chapter Summary

This chapter presented the analysis and results of the data collected from the online survey questionnaires. The results showed that Attitudes were positively associated with factors that reduce stress amongst EMS personnel, with a moderate correlation. A unit improvement in motivation was likely to raise the expectations of reducing stress and coping mechanisms amongst EMS personnel during the COVID-19 pandemic. However, the results also indicated that there were no associations between motivation to work in future pandemics and two factors: attitudes and psychological stressors. The next chapter provides a detailed discussion of the study's findings.

CHAPTER 5

DISCUSSION

5.1 Introduction

This chapter discusses the key findings related to the study's central research question: what are the psycho-social influences of working at the forefront of the COVID-19 pandemic in the Eastern Cape? The findings presented in the preceding chapter four (4) provided insights into the psycho-social influence of working at the frontline during the COVID-19 pandemic in the Eastern Cape. In this chapter, the researcher discusses the key findings in relation to relevant literature so as to shed light on the significance of the findings. The research implications show how the findings could be significant for future studies. Implications of the research are essentially the conclusions taken from the data, and they illustrate how the findings may be substantial for policy, practice or theory. The following sections discuss the results in Chapter Four as they relate to the study's research objectives.

5.2 Attitudes amongst EMS personnel during the COVID-19 pandemic

The COVID-19 pandemic turned the world upside down, impacting everything from how one lives to how one interacts with others (UNICEF, 2020). At the forefront of this pandemic where EMS personnel who worked tirelessly to treat, transport and care for patients. Being at the forefront, and given the nature of the EMS setting, they are more susceptible to infectious diseases due to their frequent and close contact with patients. EMS personnel may also be the first contact person for patients who suffer severely from COVID-19 (Dreher, 2021: 2). Emergency care is designed to overcome the factors most implicated with preventable mortality, such as postponements in seeking care, access to a health facility and the provision of adequate care at the facility (Tiwari *et al.* 2021: 8). However, according to Naidoo (2012: 149), due to the inequality of service delivery in South Africa, most of the population (84%) relies on public health sector services, which is already under-resourced (insufficient ambulance and human resources). This implies that EMS personnel were already under immense pressure before the pandemic started.

Furthermore, the Eastern Cape Province’s rural nature meant that EMS personnel must also deal with longer transport times and navigate rugged terrain when responding to or transporting patients. Therefore, as mentioned above, stressors and the current pandemic may negatively

impact EMS personnel's attitudes toward their chosen field of practice. According to the Cambridge Dictionary (2023), attitude is a feeling or opinion about something or someone. Data from the current study found that dedication to patient care and the need for work recognition were fundamental attitudes amongst EMS personnel. EMS personnel felt a sense of moral and ethical responsibility to care for patients, despite being vulnerable to the disease. Sections 5.2.1 and 5.2.2 further discusses the recognition of work and dedication to work amongst EMS personnel.

5.2.1 Dedication to patient care

Dedication to patient care is a common characteristic amongst HWCs worldwide (Fernandez, 2021: 4). The current study found that an overwhelming number (80.4%; n=296) of participants felt that their function within the healthcare setting comes from social and moral responsibility. Furthermore, 60% (n=221) of the participants expressed no desire to quit their current job. This appears to be a long-standing characteristic amongst HCWs, as Tippett *et al.* (2010: 20) reported similar findings amongst EMS personnel over a decade ago. Barnett et al. (2010: 2-3) showed more optimistic results as they found that 93% of EMS professionals would be willing to report to work if required, and 88% if asked but not required. Compared to these studies, the commitment demonstrated by EMS personnel in the Eastern Cape is equally comparable, showing that EMS personnel in different contexts understand the demands of their role.

Despite the unanimous dedication to patient care, EMS personnel acknowledged the problems and challenges that come with their role. Most participants (75.5%; n=278) were unhappy about working overtime during the pandemic, as opposed to the 24.5% (n=90) who had no objection to working overtime. The current study showed that 17.7% (n=65) of participants were firmly against working overtime during the pandemic, while 26.6% (n=98) were moderately against overtime. This was likely due to EMS personnel wanting to spend more time with their loved ones instead of working and being faced with the devastation of the COVID-19 pandemic. Moreover, working overtime meant exposing themselves to work-related stressors, which may lead to depression. Maslach and Leiter (2016: 104) argued that there is a reciprocal relationship between burnout and depression; whilst Çelmeçe and Menekay (2020: 2) warn that if the appropriate actions to protect HCWs are not taken, they will exhibit high levels of burnout associated with depressive symptoms, anxiety, suicidal ideation, and develop substance abuse.

5.2.2 Recognition of work

The current study showed that 84.8% (n=312) of EMS personnel were expecting additional financial compensation through a risk allowance during or after the COVID-19 pandemic. The need for recognition was further emphasized by 85.1% (n=313) of the participants who anticipated some recognition for their work from the EMS management. This attitude is most likely driven by the risk associated with treating and transporting COVID-19-related patients. Naidoo (2018) noted the growing number of attacks on EMS personnel in South Africa and that it jeopardizes the integrity and reliability of EMS to the detriment of the whole of society. Chersich *et al.* (2020) concluded that when compared to the Ebola outbreaks, EMS personnel working during the COVID-19 pandemic were supposed to be given risk allowances.

The data presented suggested that EMS personnel also felt neglected. Cai *et al*. (2020: 4) echoed the same sentiments and argued for the need for recognition by management. Studies during the MERS epidemic and current pandemic have reported a positive psychological impact amongst HWCs from recognition and appreciation of work and effort by the employer and authorities (Khalid *et al.* 2016: 7; Cui *et al.* 2021: 592; Spoorthy, 2020: 2). Financial remuneration, gestures of gratitude and appreciation from managerial structures would have been a way to motivate the EMS personnel during the COVID-19 pandemic. Furthermore, risk allowances were used during the recent Ebola epidemic in Western Africa, where the benefits were apparent, but the jealousy of those not receiving these allowances as they cared for non-infected patients was also evident (Raven *et al.* 2018: 6). The current study showed that the majority of the EMS personnel were interested in getting the risk allowance to work during the COVID-19 pandemic, which is consistent with other studies related to HCWs' perceptions of the pandemic (Feroz *et al.* 2020: 2; Spoorthy, 2020: 2).

According to Mathauer and Imhoff (2006: 6), providing financial and non-financial incentives is required. It can maximize the motivation of healthcare workers (HCWs), particularly in underdeveloped nations like Africa. Similarly, Chersich *et al.* (2020: 4) and Spoorthy (2020: 2) concluded that EMS personnel and other HCWs working during the COVID-19 pandemic expected and were meant to be provided risk allowances, as compared to the Ebola epidemic.

5.3 Working conditions that exacerbated stress within the context of the COVID-19 pandemic

EMS personnel deliver pre-hospital emergency medical care, and their job exposes them to the inherent risk of getting hurt or sick while on the job. Decisions made by EMS personnel in the pre-hospital setting have implications for patient safety, transport, treatment and health resource utilization (Reay et al. 2018: 1). The pre-hospital working conditions come with an inherent level of stress experienced. The findings correspond to *objective one* of the current study is presented in Chapter Four. The working conditions during COVID-19 highlighted the relevance of HCWs and their occupational health and well-being (Paredes-Aguirre, 2022: 1-2). Lack of personal protective equipment (PPE), lack of resources, colleagues getting infected, and fear of infecting others were cited as the working conditions that exacerbate stress amongst EMS personnel.

5.3.1 Lack of Personal Protective Equipment (PPE)

One major challenge in controlling the pandemic was the extreme global shortage of PPE (Wang et al. 2020: 3; Nyashanu et al. 2020: 657). The shortage of PPE caused stress amongst EMS personnel, and the results showed that EMS personnel were aware of the shortage. Due to the high patient volume at the receiving hospital, the long travel time and delayed handover resulted in EMS personnel having to stay in PPE for an extended duration. Furthermore, prolonged PPE use led to cutaneous manifestations and skin damage, with the nasal bridge being the most commonly affected site (Shaukat et al. 2020:6). According to Ventura et al. (2020: 3), some EMS personnel in the United States reported being injured due to the excessive wearing of PPE. Injury and excessive sweat while wearing PPE can make EMS personnel uncomfortable, leading to them making mistakes or being unable to perform certain duties.

Data from the current study illustrated that an overwhelming number of participants (92.4%; n=340) felt that the current protective measures were inadequate. Personal Protective Equipment (PPE) primarily protects HCWs from possible biological agent transmission (viruses, bacteria, etc.). As the pandemic expanded and continued to wreak havoc, the growing expense and scarcity of PPE and other essentials became a source of anxiety amongst HCWs globally. Fernandez (2021: 26) discovered that the unavailability of PPE was the most prevalent source of worry amongst HCWs during the COVID-19 pandemic. The current study highlighted the impact of insufficient PPE in high-income countries. One thing that every country in the world had in common during the outbreak of COVID-19 was the enormous demand for medical professionals and resources, with a concentration on EMS personnel wearing PPE to lessen the likelihood of

transmission. This was not any different in the context of South Africa, even more so in the rural regions like the Eastern Cape, which is the focus of this study. Several additional studies have identified the absence of PPE as a significant stress predictor for HCWs (Du *et al.* 2020: 144; El-Hage *et al.* 2020: 74; Walton *et al.* 2020: 242).

At the onset of the pandemic, several African nations suffered an acute shortage of PPE owing to global supply interruptions, which was aggravated by Africa's strong reliance on imports for key medical equipment (The Guardian, 2020). The lack of PPE exacerbated the dread of contracting the disease, which in turn led to psychological illnesses and occupational depression (Mohammadi *et al.* 2021: 7). Unlike hospital environments, ambulances are small, confined spaces with poor air circulation, where airborne diseases are held for prolonged periods of time. Lindsley *et al.* (2019: 7-8) discovered that aerosols generated from patient coughs circulate uniformly throughout an ambulance due to ventilation systems. There are also no areas within a vehicle with a decreased risk of infection. Nabe-Nielsen (2020: 1) concluded that the feeling of uneasiness amongst employees and the fear of being infected or transferring illness are exacerbated by inadequate knowledge and a lack of access to PPE. The current study results support Nabe-Nielsen's (2020: 1) findings and imply that the lack of PPE causes stress and anxiety.

HWCs who were provided with adequate PPE found a sense of safety and protection. A study by Zhang *et al.* (2020: 145-146) uncovered that PPE access predicted better physical health, job satisfaction and less distress, demonstrating its importance beyond physical protection. PPE creates a barrier between healthcare workers, COVID-19, and other harmful viruses and bacteria, and they must continue working safely and caring for patients without fear of infection. Thus, governments should aim to equip EMS personnel with effective PPE, which may reduce anxiety and increase job satisfaction.

The use of PPE for a prolonged period does not come without a downside. HCWs reported several issues when wearing PPE frequently and for an extended time. This has resulted in unanticipated repercussions, such as an apparent increase in sensitivity to unfavorable skin responses and a mental load for individuals (Rosner, 2020: 2). The current study results reported that a majority of the participants (92.9; n=342) felt exhausted most of the time. Rosner (2020: 2-3) reported that PPE causes pain, as well as overheating and sweating, which hinders the capacity of HCWs to perform patient care procedures such as cannulation and dressing changes (Rosner, 2020: 2-3). After longer durations of PPE wear, these discomforts may also lead to HCW stress and fatigue. Due to the nature of rural areas, EMS personnel may need to travel further or navigate rugged

terrain when responding to an emergency or transporting a patient to the hospital. This increases the amount of time that EMS personnel must be in PPE compared to urban areas with shorter travel times.

The current study reported that more than 95% (n=350) were scared of being infected should they make a small mistake. Consistent with Rosner's (2020: 132) findings, HCWs reported that the fogging of glasses or goggles resulting in impaired eyesight was the leading factor in lowering comfort levels and raising stress when treating patients. Physical and psychological obstacles include the repeated donning and doffing of PPE throughout a shift and the obligation to wear unpleasant masks and goggles for extended periods (Tong *et al.* 2015: 2). As the epidemic evolves and a greater understanding of viral transmission pathways develops, PPE regulations and procedures must be modified continuously.

5.3.2 Lack of resources

More than 91% (n=337) of participants believed that the lack of resources (PPE, ambulances, EMS personnel) caused them stress. The lack of ambulances and personnel means that the EMS personnel must work with limited resources and long hours to provide emergency medical care through unprecedented times – the COVID-19 pandemic. As a result of prolonged working hours and limited resources, EMS personnel may suffer from burnout and related symptoms. According to Naidoo and Cartwright (2020: 2), infrastructural constraints and poor working conditions result in a high prevalence of burnout, anxiety and depression symptoms amongst South African HCWs. Alghamdi (2022: 1-7) reported that EMS personnel experience more significant psychological challenges because of the catastrophe response without the proper psychological support.

Similarly, Mohammadi *et al.* (2021: 3) discovered that emotional weariness was related to worse job satisfaction, longer duration in service ambulances, less recovery time between events, and greater exposure to incidents. The shortage or lack of resources caused psychological and physical stress amongst the current study participants. The current study results are reflected by Brahmi *et al.'s* (2020: 1) study - due to a shortage of equipment and work overload in the present crisis, particularly in staff and ambulances, EMS personnel encounter several psychological obstacles that negatively impact the quality of their pre-hospital emergency care. The study shows the need to minimize the exposure of EMS workers to COVID-19 infection during the transportation of patients. During the present COVID-19 crisis, senior emergency care administrators should design comprehensive guidelines, supply additional equipment, and

eliminate professional obstacles to improve the quality and safety of pre-hospital emergency care services (Swaminathan *et al.* 2022; 231).

In Iran, the EMS changed how they delivered care by increasing the number of personnel, reducing time off between shifts and increasing overtime hours, which helped ease the burden of the pandemic (Siberian, 2020: 115). A study by Almaghrabi (2020: 658) found that 74.3% of HCWs were willing to work overtime, significantly higher than the current research. In addition, a survey by Qasem *et al.* (2020: 540) reported a nearly equally distributed opinion regarding overtime. Liang (2020: 2) argued that reasonable resting for HCWs may help relieve stress. With constraints on their social life, overtime, in particular, decreased the time for recovery and quality individual and family time.

5.3.3 Fear of infection

Despite the dedication evidenced in the current study, some participants (89.4%; n=329) reported being overwhelmed with fear over the risks associated with dealing with COVID-19 patients, so much so that some considered quitting their jobs. According to the current study, many participants (79.6%; n=293) felt afraid and nervous whenever they worked in the ambulance. Transporting a suspected or confirmed COVID-19 patient increased fear and anxiety amongst the participants. Such fear most likely emanated from the lack of PPE, limited knowledge about the disease, the associated stigma, and misconceptions about the efficacy of available vaccines.

The current study findings reported that more than half the sample (66.3%; n=244) were prepared to quit their jobs if the pandemic suddenly worsened without adequate PPE, a known cure, and a lack of incentive. Participants feared for their health and that of their loved ones. Many believed that quitting their job was the best way to minimize exposing their loved ones and themselves to the disease. Furthermore, almost 70% (n=255) of participants felt that whenever they had to go to work, they wanted to call in sick. Considering quitting or calling in sick to avoid going to work demonstrated a high level of apathy amongst EMS personnel in the Eastern Cape.

From the reviewed literature, fear of infection was one of the major themes that emerged. Studies from the 2003 SARs outbreak showed that those healthcare workers feared contagion and infection of their family, friends and colleagues (Bai *et al.* 2004: 1056; Lee *et al.* 2007: 233). The fear of improper use or unavailability of personal protective equipment (PPE) and associated infection risks was also prevalent in different studies that were conducted (Xiao *et al.* 2020: 6; De Kock *et al*. 2021: 9-12; Spoorthy *et al.* 2020: 3). Buselli (2020: 2) suggested that those HCWs who feared infection of their close ones reported experiencing high levels of stress, anxiety and

depression symptoms, which could have long-term psychological implications. According to Hayes and Clerk (2021: 3), fatalism is positively associated with depression but negatively associated with fear and insecurity, thereby causing a direct impact on human resources and resulting in staff shortages due to psychological distress. Therefore, it is imperative to create a working environment that ensures that HCWs feel safe and empowered to do their jobs regardless of the apparent risks.

A McKinsey (2021) study of front-line nurses revealed that 22% of them were considering leaving their jobs in the coming year, with 60% of those responding that the epidemic had increased their likelihood of doing so. More than half of the respondents from their study stated that they intended to change careers, look for work in a field other than direct care, or retire or leave the workforce. Insufficient staffing, workload and the pandemic's emotional toll were cited as the top three reasons (McKinsey, 2021).

5.4 Factors that reduced stress amongst EMS personnel during the COVID-19 pandemic

The current study's *second objective* sought to identify factors that reduced stress amongst EMS personnel. Stress is an interactive process between the person and their surroundings, which is influenced by stressful events or factors on physical and psychological well-being (Salleh, 2008: 9-10). Increased stress has been linked to various major health issues, including cancer and psychological illnesses. EMS personnel had to focus on factors that reduce stress to avoid health-related issues due to the COVID-19 pandemic. Studies that conducted research at two separate time points during the pandemic (1st vs. 2nd wave) found that the prevalence of pandemic-related stress lowered at a later stage (Dreher et al. 2021: 8). This may have been because over time, HCWs were getting used to the situation, therefore adapting to the new "normal". The factors that reduced stress the most in this study were joking and chatting with colleagues (M=3.29), recovery from infection by patients (M=3.11), and colleagues that got infected but then got better (M=3.05).

5.4.1 Chatting and joking

The current study findings suggested that joking and chatting with colleagues significantly reduced stress amongst EMS personnel in the Eastern Cape. Of the study participants, 98.6% (n=360) felt that joking and chatting with colleagues helped reduce their stress levels. Taking into consideration the events that led up to the COVID-19 pandemic and the fact that people's lives, both personally and professionally, changed dramatically almost overnight, it is possible that the

best course of action would be to acknowledge the truth of what has transpired and work on finding ways to adapt to lead an everyday life (Brooks *et al.* 2020: 913). Studies have shown that people frequently rely on social connections to cope with circumstances when they feel that they have little influence over the outcome (Raab *et al.* 2016: 435; Bowins, 2021: 43-44). Social contacts can therefore be an adaptive coping technique under certain conditions since they have the potential to offer individuals closure and make it possible for them to go on with their lives despite the presence of challenging situations (Chow *et al.* 2021: 3). The current study results imply that chatting with friends and colleagues as part of social interaction was a positive contributor to stress reduction amongst the participants.

Discovering different methods to divert attention away from whatever is causing tension is one of the most straightforward psychological strategies for achieving quick relief from stress. Chatting and joking are very efficient, straightforward and low-cost techniques to reduce stress for many people (Brooks *et al.* 2020: 913). There are many different reasons why joking and chatting are an excellent approach for alleviating stress. The first benefit of joking chats is that they may serve as a diversion, thus breaking the train of thinking that might lead to stress. The attention that might otherwise be directed towards oneself is re-directed to other people through chatting and laughter, and this movement in focus broadens people's anxiously narrowed viewpoint to encompass the misfortune of others, thereby lessening the perceived need to be concerned about their issues (Chow *et al.* 2021: 3).

5.4.2 Recovery from infection

The current study results reported that the recovery of friends/colleagues and patients from the COVID-19 infection reduced stress amongst EMS personnel. When a colleague recovered from the COVID-19 infection, 99.2% (n=365) of the participants felt relieved, while 97.6% (n=359) felt at ease when their patients recovered. Due to the high amounts of stress frequently present in their line of work, medical professionals are at an increased risk of developing mental illnesses, abusing substances, committing suicide, and having impaired functioning. They may feel a need to save the patient, a sense of failure and frustration when the patient's illness progresses, and feelings of helplessness in the face of illness and the associated loss of human life (Brooks *et al.* 2020: 913). All of these feelings result from the nature of their work, which puts them in contact with a wide range of emotions and stress. The relationship between the patient and the healthcare worker imposes fiduciary responsibilities on the healthcare worker, which increases satisfaction and reduces stress when the patient recovers (Lázaro-Muñoz, 2014: 5). The period during which a patient is hospitalized, followed by treatment and medical care, is fraught with concern for both

the patient and the treating physician. Nevertheless, the improvement of the patient alleviates this anxiety.

EMS personnel are frequently involved in life-threatening situations and their immediate aftermath. In addition, they are commonly presented with an unpleasant side of humanity due to dealing with individuals in panic and anxiety (Robertson *et al*. 2020: 1011). Both the COVID-19 reaction and the continuation of essential services rely heavily on the motivation and empathy of healthcare staff (Rabow *et al.* 2021: 650). Notably, this epidemic has exacerbated pre-existing "professional grieving" concerns amongst HCWs, who also experience "personal loss" when a patient dies (Chow *et al.* 2021: 3). Professional sorrow refers to the pain experienced by healthcare professionals owing to the loss of a patient, whereas personal grief refers to the grief experienced by healthcare professionals due to the loss of their loved ones (Rabow *et al.* 2021: 650). Thus, the recovery of patients and loved ones from COVID-19 provided relief for healthcare workers and acted as a source of motivation.

There are many advantages associated with making it a priority to improve the experience of patients and the outcomes. When patients progress in their recoveries, healthcare providers report higher levels of job satisfaction and motivation, which relates to an increase in their happiness levels (Rabow *et al.* 2021: 650). Similarly, human beings are social beings, and when a colleague or relative recovers from a medical condition, it relieves stress (Robertson *et al.* 2020: 1011). Thus, the study results also imply the need to improve health outcomes to reduce the stress of EMS personnel.

5.5 Psychological stressors amongst EMS personnel during the COVID-19 pandemic

The *third objective* of the current study focused on identifying the psychological stressors amongst the Eastern Cape EMS personnel during the COVID-19 pandemic. According to Monroe and Slavish (2016: 109), psychological stressors are social and physical environmental circumstances that challenge an organism's adaptive capabilities and resources. These situations cover many possibilities, each with its unique combination of physical and mental characteristics. The current study had 19 factors in the scale investigated concerning stress amongst EMS personnel. The current study only described those factors the respondents felt mattered, as depicted by the proportions of respondents who expressed negative sentiments (stress factor). The current study results showed that small mistakes could make EMS personnel or others infected (M=3.13); that there was a lack of specific treatment for COVID-19 by the time of the survey (M=3.15); and

seeing stress or fear from their colleagues (M=3.16) are psychological stressors for EMS personnel.

5.5.1 Fear of infection

The current study showed that EMS personnel were widely concerned about making mistakes that might in turn infect them or their loved ones. Almost 93% (n=342) of the participants were highly concerned that small mistakes could result in them infecting others or themselves. The concern about infection amongst EMS personnel is reflected in several studies (Ilczak *et al*. 2020: 147; Ardebili *et al.* 2020: 4). EMS personnel work in a complex and unpredictable work environment where an error or poor clinical judgment may often lead to mortality or poor patient outcomes. In addition to impacting patients and their families, medical mistakes may also negatively and emotionally impact the engaged HCWs (Billings *et al.* 2021: 5-12). EMS personnel must work in confined spaces (ambulance) with poor ventilation and are therefore at high risk of infection (Lindsley et al. 2019). The lack of policies and practice policies may have also made EMS personnel more prone to mistakes (Ardebili *et al.* 2020: 550). The study showed that nearly half of the participants (78.8; n=290) believed that they had been infected by a patient while on duty. Several studies have highlighted the alarming death rate and infection amongst HCWs due to the ongoing COVID-19 pandemic (Magnativa, 2021: 2; Lapolla *et al.* 2020: 363; Sabetian *et al.* 2021: 1). However, none of the studies have researched the source of infection, whether it was from a patient, colleague, family members or public. While some studies have emerged regarding the prevalence of infection amongst different hospitals, no data is available on the prevalence of EMS personnel infections.

While EMS personnel fear getting infected, they are also concerned about transmitting the infection to their loved ones once they get home from work (Ardebili *et al*. 2020: 552; Liang *et al*. 2020: 15). Brooks (2020: 53) argued that the COVID-19 high mortality rate, high transmission capacity, and the shortcomings of health systems have impacted the mental health of HCWs. The fear of infections may also impact human resources, as a study by Tujjar and Simonelli (2020: 2716) noted that a small cohort of workers had been subjected to absenteeism due to the ongoing pandemic. However, they had no solid figures or factual evidence that absenteeism was only due to fear of infection, or other non-COVID-19 related reasons. Furthermore, although the current study had a relative portion of participants (42.9%, n=158) who had thought about calling in sick when they had to work, there is no actual evidence that the sick leave taken during the pandemic was solely related to fear of infection. The result of the current study relates to the finding of Nohl

et al. (2021: 5) that EMS personnel in Germany felt burdened by the pandemic due to being infected themselves, or a close relative.

5.5.2 Lack of a cure or treatment

The lack of a cure or vaccine was also highlighted as one of the major causes of psychological stress. The current study showed that most participants (96.2%; n=354) believed that the lack of a COVID-19 cure, or treatment was a stress-causing factor, while only 3.4% (n=14) did not share this sentiment. At the time of the survey (June 2022), several WHO-approved vaccines were available around the globe. As of April 2020, more than 500 million COVID-19 vaccines have been administered worldwide (CDC, 2022). However, there have been growing concerns amongst the scientific community as more and more sub-variants of the SARS-Cov-2 emerge.

Furthermore, these variants have demonstrated increased transmissibility, with further research being required to understand how certain viral mutations affect the severity of illness (Harvey et al. 2021: 410). The developed vaccines have varied efficacy, with booster shots required now and then to strengthen the immune system to fight the virus. This caused some doubt about whether they are effective, especially when EMS personnel are in close contact with a patient who might be infected. It has been shown that HCWs are more susceptible to the physical dangers associated with COVID-19, and no vaccination exists (Qatta *et al.* 2021: 9; Shaukat *et al*. 2020: 6-7).

During the first year of the global pandemic, many HCWs were infected, with a high mortality rate due to COVID-19 (Ardebili *et al*. 2020: 551). Considering this, the physical protection of healthcare workers and the development of vaccines were deemed "essential" components of the COVID-19 response. The results align with the study by Ardebili *et al.* (2020: 551) as they show that stress associated with the absence of vaccines was a psychological stressor for EMS personnel. Studies conducted during this pandemic indicate that medical HCWs (medical physicians and nurses) had a greater prevalence of mental health-related symptoms than non-medical HCWs, particularly fear of infection without available vaccines to treat them (Shaukat *et al.* 2020: 3). While South Africa had time to prepare for the pandemic, healthcare personnel first displayed anticipatory fear and other heightened emotional states (Zhang *et al.* 2021: 39). As COVID-19 caseloads and healthcare worker infections grow and vaccines were unavailable, it was anticipated that persistent, unrelenting stress would raise the likelihood of anguish, burnout and moral harm, as well as certain mental illnesses. At the time of submitting the study, early 2023, there was still no known cure for the pandemic.

5.5.3 Stress and anxiety amongst colleagues

A study by Billings *et al.* (2021: 5-12) noted that seeing stress or fear from colleagues was one of the major causes of psychological stress. The current study showed that 81% (n=299) of the participants observed stress or anxiety from their colleagues. Seeing their colleagues infected may have made EMS personnel scared that they might get infected if they got too close to their colleagues. This could also have made them realize how easily they could get infected. Another study by Al Qahtani *et al.* (2021: 1) concluded that EMS personnel suffered from social and psychological depression during the COVID-19 pandemic. Karlsson and Fraenkel (2020: 1) argued that the greatest risk of HCWs may be their colleagues or patients in the early stages of unsuspected infections when the viral loads are high. The number of cases of COVID-19-related infection has left everyone with the sense that "no one is safe". Furthermore, media coverage of the pandemic has consistently emphasized the number of deaths amongst HCWs and the spread of the disease within health and social care facilities, likely to have exacerbated the negative impacts and fear amongst the general population and HCWs. However, studies have shown that too little and too much information can harm the general population's mental health (Farooq and Fareeha, 2020: 163).

In addition, grief for personal losses and those of patients and co-workers, along with the difficulties of the lockdown, place a significant strain on the resilience of any individual. Emotional anxiety was linked with fear of COVID-19 expressed by others and excessive professional responsibilities in the setting of sub-optimal healthcare resources for patients and healthcare workers (Billings *et al.* 2021: 5-12). EMS personnel in South Africa experience high levels of stress since they attend gruesome scenes, experience extreme pressure to save lives, and sometimes attend a scene where a child or a colleague is involved (Zana, 2019: 13). The overall stress and anxiety would be highest amongst themselves, so much so that it is visible to their colleagues. Furthermore, pre-pandemic, existing resources, infrastructural constraints, poor working conditions and a high prevalence of burnout, anxiety and depression symptoms amongst South African HCWs were already evident (Naidoo and Cartwright, 2020: 2). In addition, Fernandez (2021: 4) noted that in a study by Xiang (2020), HCWs have reported feeling unprepared and confused when faced with COVID-19 related patients, especially since equipment guidelines and treatments were not established at the beginning of the pandemic. Since Western countries were harder hit by the pandemic, and most medical research emanates from them, African countries may have been anticipating guidelines and treatment from European countries. Therefore, in the

absence of proper procedures and policies, EMS personnel faced the same fate as their counterparts.

5.6 Coping mechanisms

The *fourth objective* of the study was to identify the coping mechanisms used by EMS personnel in the Eastern Cape during COVID-19. Coping is defined by the cognitive and behavioral efforts employed in response to external or internal demands that the individual deems as a threat to their well-being (Freire *et al.* 2020: 2). Past studies have shown that HCWs at high risk of exposure to infectious disease outbreaks exhibited extreme stress; were emotionally influenced and traumatized; and had extreme levels of symptoms of depression and anxiety (McAlonan *et al.* 2007: 241; Sabetian *et al.* 2021: 2-3). The results from the current study showed that seeking help from a psychologist (M=3.27), chatting with family and friends to relieve stress and obtain support (M=3.38), and learning about COVID-19 prevention and mechanisms of transmission (M=3.38) are the top three coping mechanisms. The top three coping mechanisms are regarded as problem-focused and emotion-focused, in line with the study by Fluharty and Fancourt (2021: 3). According to Fluharty and Fancourt (2021: 3), the problem-focused and emotion-focused mechanisms are centered on the stressor and an individual's activities in response to it.

Research on stress has highlighted the importance of coping strategies in preventing harmful consequences amongst HCWs during the pandemic (Miller and Brown, 2021: 4-6; Munawar and Choudhry, 2021: 290-291; George *et al.* 2020: 3-4). Miller and Brown (2021:4-6) emphasized the importance of coping strategies in preventing harmful consequences. As a direct result of the psychological emergency caused by the COVID-19 epidemic, since the beginning of the outbreak, more than five hundred mental health specialists have donated their services to help HCWs through a variety of organizations (Fluharty & Fancourt, 2021: 3). This showed that psychologists have been utilized as a coping strategy amongst HCWs.

Social support, especially chatting with friends, is important in coping with stress. More research has pointed to the function that social support plays in lowering the levels of anxiety experienced by medical personnel and in elevating their feelings of self-efficacy (Xiao, 2020: 5). The current study noted that almost all of the participants (99.2%; n=365) resorted to chatting with friends and family to cope with stress. Chatting with family and friends as a form of social support is in line with the study by Xiao (2020: 5). Similarly, Cia et al. (2020: 14) discovered that the support of superiors proved to be one of the most significant motivating elements for healthcare professionals. This implies that social support as a coping mechanism should be utilized. It is also

possible that one of the most efficient ways to deal with stress is to have a supportive person listen to one talk about a difficult incident (Chang and Hu, 2022: 8). Moreover, it is possible to significantly mitigate the detrimental consequences of a challenging circumstance by turning to outside resources for assistance rather than isolating oneself and trying to cope with the stress on one's own.

The current study results also showed that venting their emotions by crying, screaming, etc. (M=2.80); avoiding working overtime to reduce exposure to COVID-19 patients in the ambulance (M=2.81); and avoiding media news about COVID-19 and related fatalities (M=2.91) were personal coping strategies used to alleviate stress. Crying is a common and healthy way for people to deal with difficult situations, including times of intense pain, anger and stress (Chang and Hu, 2022: 8). For many people who work in healthcare, the collective sadness over these deaths and the anxiety connected with COVID-19 can only be characterized as astounding. It should not come as a surprise then that sentiments are closer to the surface during times like these, and that many individuals who were not previously prone to crying discover that they are tearing up more quickly than usual as a coping mechanism. Crying is a behavior that has been demonstrated to improve attachment behavior, which encourages connection, empathy and support from friends and family. Even though it is more commonly linked with negative feelings, crying is more than simply a sign of sadness and stress (Chang and Hu, 2022: 9). The study results imply that crying, as associated with perceived symptoms of stress and sadness, may drive people not to use it as a coping mechanism.

5.7 Relationship between motivation, stress and coping

The correlation results show that the factors that reduce stress amongst EMS personnel were positively associated with motivation ($r=0.26$, $p<0.05$), psychological stressors ($r=0.209$), and coping strategies ($r=0.47$). Motivation encapsulates the internal force that compels individuals to think, feel and react in a particular manner in response to their circumstances (Brahmi *et al.* 2020: 42). The level of motivation that an individual possesses may be influenced by a variety of things, including their level of physical health, psychological factors and social contentment (Çelmeçe & Menekay, 2020: 3). Negative stress causes healthcare professionals to lose attention, creativity and productivity. However, reducing stress levels promotes employee motivation. There is a school of thought amongst some psychotherapists that suggests that if a person engages in constructive motivational self-talk and makes an effort to reframe the way they think about events,

they can lessen the impact on their bodies and minds that dealing with traumatic or stressful experiences can have (Çelmeçe & Menekay, 2020: 3). The goal of therapy is to educate patients on how to model a healthy response to a stressful situation and how to tap into their own motivation as a source of personal strength. It has been shown that those who feel as though their lives have a purpose tend to have better levels of psychological well-being and lower levels of depressive symptoms than those who do not feel as though their lives have a purpose (Brahmi *et al.* 2020: 42). The study results contradict the study by Brahmi *et al.* (2020: 42) as they show that an increase in motivation is associated with an increase factor that reduces stress. This implies that motivation plays a significant role in the stress management of EMS workers. Stress is a multi-dimensional concept that is effectively managed by the interaction of various factors, including motivation.

The current study results indicated a positive correlation between factors that reduce stress and psychological stressors. There are a different number of psychological factors that affect the well-being of EMS personnel, hence various factors need to be implemented to address them. Psychological stress is multi-dimensional and needs to be addressed by various factors (Çelmeçe & Menekay, 2020: 3). The current study results implied that the number of factors that reduce stress needs to be increased as psychological stressors increase. Stress management is not a one-size-fits-all approach as each psychological stressor has an effective way which deals with it. Most of the time, unfavorable life changes are related to psychological stress, yet all changes involve some form of adaptation, which calls for various elements to be utilized to lessen this type of stress.

Similarly, the results showed that stress reduction factors are positively associated with coping mechanisms (Brooks *et al.* 2020: 913). The process of managing stress often entails adjusting or learning to tolerate unpleasant experiences or realities while attempting to maintain a good self-image and emotional balance. Hence, coping is impacted by a wide variety of situations. Humans seek and implement coping strategies to find answers and responses to stressful situations or difficulties brought on by the pressures themselves.

5.8 Motivation to work in future pandemics

Having identified the working conditions, established the factors that reduce stress, noted the psychological stressors, and identified the coping mechanisms amongst EMS personnel, the current study came up with likely measures to support and improve the working conditions for

EMS personnel. These strategies were, in part, informed by the research participants as well as the reviewed literature.

The current study illustrated that the motivational factors that encourage the continuation of work during future pandemics were mainly family support, followed by effective treatment of the disease and the vaccination process. EMS personnel favored effective treatment, family support and financial incentives, and believed that these would enhance their willingness to work in future pandemics.

Adequate information and education about a pandemic in terms of how it is transmitted, as well as the prevention and treatment of such, is crucial in the fight against a pandemic and the well-being of those on the frontline fighting the pandemic. The onset of COVID-19 and even months into the pandemic were shrouded with a lot of conflicting information. Although there has been a breakthrough with vaccines, almost three years after the first wave of the pandemic, there is still no cure for the disease. According to the current study, nearly all participants (99.2%; n=365) indicated that effective treatment and vaccines motivated them to work in future pandemics. The perception is that EMS personnel might feel safer knowing that even if they get infected, they can avoid the worst-case scenario (death) if effective treatment exists.

According to the current study's coping strategies, which are also discussed early in the chapter, family support was deemed an essential component by almost 99% (n=363) of participants in helping them cope and continue providing their services. Health facilities should therefore ensure that they have a psychologist available for consultation by the EMS personnel as and when they need such services.

Approximately 98.6% (n=363) of participants expressed a desire for financial incentives as motivation to work in a future pandemic. EMS personnel may need extra financial incentives to support their family should they get ill, injured or die during a pandemic response. Financial support for families will increase the attitude of HCWs to report to work (Almaghrabi *et al.* 2020: 658). In line with the current study, study participants from Almaghrabi *et al*. (2020: 658) favored antiviral therapy/vaccine over financial incentives.

5.9 Chapter Summary

The discussion in this chapter brought together the findings in Chapter Four and the literature in Chapter Two, which either refuted or supported the gathered evidence. The study showed that the Eastern Cape EMS personnel were dedicated to providing emergency care during the

pandemic. Inherently, they also reported not feeling appreciated and fearing getting infected or infecting others as ongoing concerns. Furthermore, apathy was common due to long working hours, a shortage of personnel, ambulances, and PPE. These working conditions heightened the stress levels amongst the study participants. Despite these challenges, the EMS personnel had to adapt and cope. Some coping mechanisms applied included seeking help from a psychologist, chatting with family and friends to relieve stress and obtain support, and learning about COVID-19 prevention and the transmission mechanism. The chapter ends by suggesting ways to support and improve the working environment for EMS personnel, namely family support, psycho-social support, providing adequate information, and ensuring that the health facilities have adequate resources, including enough personnel. The next chapter (Chapter 6) elaborates on the study recommendation, limitations and conclusion.

CHAPTER 6

RECOMMENDATIONS AND CONCLUSION

6.1 Introduction

This chapter is the culmination of the study and focuses on highlighting the key findings as well making recommendations for the EMS sector. The chapter begins by acknowledging the limitations of the study which are inherent in the research design and methodology. Thereafter recommendations for the EMS sector are proposed, being informed by the findings of the study. The chapter also makes recommendations for future research. Conclusions are drawn which highlight the significance of the study and its relevance to the discourse.

6.2 Limitations

The study provided insight into the psycho-social problems that EMS personnel faced during COVID-19. However, the study did have some limitations which include:

- Due to the quantitative nature of the study, the study lacked generalizability. Only EMS personnel from the Eastern Cape were selected, making the study local and therefore results cannot be generalized to the rest of the country.
- Due to the criteria of the study, only EMS personnel were selected, and no other healthcare professionals, such as nurses, doctors, physiotherapists, etc. participated.
- The study used closed-ended questionnaires, which limited participants' opinions/perspectives, which may have valuable qualitative data. Participants could not express themselves as they would in interviews, and the study could have missed out on important information.
- As a result of the nature of the data collection used in this study, the accuracy and completeness of the information presented here depend in part on the honesty and recollection of the participants, which may be subjected to recall bias.

6.3 Recommendations for EMS and HCWs

EMS is a top-down system, which favours the widespread implementation of policy-directed action. The potential benefit that EMS policy developers and associated managerial structures may have been alleviating the mental health burdens of pre-hospital HCWs. The findings indicate that EMS personnel in the Eastern Cape are likely to face detrimental effects on their mental health as a direct result of the pandemic and their profession. The EMS industry and EMS support structures, particularly those in the Eastern Cape must therefore provide staff support, infrastructure and equipment to keep EMS personnel involved in fighting future pandemics/epidemics and promote a safe working environment. Based on the study findings, the study provides the following recommendations.

6.3.1 Improving working conditions

Given the high physical and mental demand for their services during times of crisis, several studies have focused on identifying protective factors that would improve the performance and adaptability of HCWs (Shanafelt *et al*. 2020: 2134). However, this capacity for adaptation and resilience results from the protection and support provided by adequate working conditions, which reduce psycho-social risk factors. This study demonstrated that one of the major stress casuing factors amongst EMS personnel in the Eastern Cape was lack of protective equipment and poor working conditions. Interestingly, and in favour of the current study findings, studies have demonstrated that training in biosafety measures, the correct application of infection control procedures, and the provision of personal protective equipment, as well as recognition of their efforts at the institutional and government levels, can generate a sense of security and motivation to continue working during the pandemic without stress (Carbajal *et al.* 2020: 401). Providing a work environment where trust and physical and psychological safety are strengthened depends on supportive management, which in turn increases commitment, involvement and mental health (Shanafelt *et al.* 2021: 2134). When employees think that their work environment is unsafe and they cannot trust management and organizational structures to protect them during high environmental stressors, such as a growing pandemic, they may suffer increased stress. By implementing measures that encourage more worker participation and consider their recommendations may boost trust, enhance compliance, minimise negative impression and enhance mental health (Shanafelt *et al.* 2021: 2134).

6.3.2 Strengthen employee support programs

Provision of resources to support the well-being of the EMS personnel in the Eastern Cape during COVID-19 is a recommendation emerging from this study. Employers might equip employees with information and tools to manage stress (Timothea, 2020: 636). This might include online yoga courses, films on mindfulness, or video teleconferences with mental health professionals. Employers should also develop a policy for stress management that specifies in detail the measures workers can take when exhibiting indicators of job stress. Employee support programs are one of the most effective means of treating workplace stress, i.e., employee assistance programs (EAPs). As identified in this study, engaging with a psychologist to relieve and manage stress was one of the major coping mechanisms cited by the EMS participants in the Eastern Cape. Such programs provide employees access to mental healthcare and other services that may enhance employee health and productivity (Timothea, 2020: 636). Employers operating during the epidemic should consult with their employees to find the most effective options for enhancing EAPs. One example is the Independent Counselling and Advisory Services (ICAS), which provides leading Employee Health Wellness Program (EHWP) services to companies across all South African sectors. ICAS could be utilized by EMS personnel as it iis dedicated to ensuring that the health and well-being of employees are well taken care of, whether at work or home.

6.3.3 Provide mental health services

Providing mental health services during COVID-19 might be challenging, but such options should be sought to reduce professional stress and burnout. Recommendations include constructing teams or multi-disciplinary teams of mental health professionals who can give mental health treatments or link to suitable resources if a healthcare worker exhibits fatigue (Sultana *et al.* 2020). Psychological counsellors should be accessible in professional staging areas to listen to the troubles and tales of employees and give help as needed (Maben & Bridges, 2020: 4).

Group consultations or peer support meetings are also advised, as they provide an in-depth discussion of certain themes (Rahman *et al.* 2020:14). Peer support and group support are highly recommended amongst nurses due to their "natural" tendency to care for others rather than themselves, which requires others (colleagues and leaders) to remind them to think for themselves and find ways to help new members feel safe, valued and welcomed as soon as possible (Maben & Bridges, 2020: 4).

6.3.4 Improving organizational approaches

The improvement of organizational metrics that influence workplace culture and stress is considered crucial. Potential strategies include improving workflow management, organizing services aimed at reducing workload, improving interoperability, organizing discussions and exchanges of opinions, enhancing communication skills, providing adequate rest and exercise, and organizing seminars on coping skills (Petzold *et al.* 2020: 45). Such organizational support should include guarantees such as assistance to doctors and nurses who become ill, as well as medical and financial support (Petzold *et al*. 2020: 45). These services could also benefit EMS personnel as they are HCWs. In addition, it is suggested that the organization give a resting area, guaranteed food and daily supplies, recordings of their job to share with family members to alleviate concerns, training to manage the patient's psychological issues, and the supply of personal protection equipment (Shanafelt *et al*. 2020: 2134). The recommendations regarding the implementation of all necessary measures to protect occupational safety suggest that the employer and managers of health structures must guarantee the adoption of preventive and protective measures and provide adequate personal protective equipment to health workers, as this increases a sense of security and decreases stress (Petzold *et al*. 2020: 45).

6.4 Recommendations for future research

- Based on the stated limitations inherent in the study design and methodology, the following recommendations for future research are suggested:
- Face to face data collection would enable EMS personnel with limited access to the internet to participate in the study.
- Increasing sample size to include other provinces and other healthcare professions (doctors, nurses, physiotherapists) has the potential to enhance the study findings and generalizability.
- A mixed method approach which would complement the survey (quantitative) with interviews (qualitative) would allow the participants to express their feelings, thoughts and experiences. This form of methodological triangulation would give more credibility to the study and allow a more in-depth analysis of the experiences of EMS personnel.
- Consider investigating the effectiveness of existing support programs for EMS personnel in the Eastern Cape to get a more holistic picture and ultimately use the information to assist with developing and improving support programs in the future

6.5 Conclusion

The study explored the nature of psycho-social problems caused by the COVID-19 pandemic on frontline healthcare workers in the Eastern Cape. As a direct and immediate consequence of providing care to COVID-19-infected patients, frontline HWCs put themselves at risk for various adverse physical and emotional effects. The findings showed moderate agreement to different stressors, indicating that EMS personnel do not suffer from existential fears but are somewhat worried about their own risk of infection and those of their family. It was also observed that stress had been found to impair cognitive functioning and task performance. Furthermore, perceived and actual social support provided to EMS personnel provides an effective protective mechanism and alleviates psychological vulnerability. The main stress factors included the availability of PPE, infection and treatment protocols, recognition of their work by EMS management, and the perceived risk of infection to themselves and others. Gaining insight into the daily challenges faced by HCWs and coping strategies adopted will assist EMS personnel, managers and policymakers in mitigating physical and emotional stressors, as well as burnout. The study findings are consistent with what was already known from previous studies conducted on HCWs during previous pandemics, thereby being relatively predictable. This emphasizes the importance of basing pandemic planning and reactions on the most current and reliable data.

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ANNEXURES

Annexure A: Information letter

LETTER OF INFORMATION

Dear Participant

Thank you for taking the time to consider participating in my study.

Title of the Research Study:

The psycho-social challenges of working at the forefront of the COVID-19 pandemic: a survey of emergency care services personnel in the Eastern Cape EMS.

Principal Investigator/s/researcher: Patrick Mfanafuthi Mavuso (MHSc: Emergency Medical Care)

Supervisor: Professor Raisuyah Bhagwan (PhD)
Co-supervisor: Mr. Mohammed Naseef Abdullah (Mphil EM)

Invitation to potential participant: Warm greetings! Trust you are well.

I am currently registered for a MHSc in Emergency Medical Care at the Durban University of Technology. I would like to invite you to participate in my study on Emergency Medical Care personnel's psychological influence and coping strategies during the COVID-19 pandemic.

Brief Introduction and Purpose of the Study:

In the context of the global crisis caused by the COVID-19 pandemic, healthcare workers are the first line of defense to combat the disease. Healthcare workers (HCWs) across the globe, with South Africa being no exception, face a substantially high risk of infection and death due to excessive exposure to the virus. Furthermore, evidence from previous outbreaks, along with early evidence from the COVID-19 pandemic, suggest these events have a significant short-and-long-term effect on the psychological health of HCWs. Existing research on the physical and mental health of HCWs is mainly focused on urban and in-hospital settings. The conclusions made may be accurate for most high-income countries but different when it comes to low-middle-income countries. In addition, the mental and physical influence of the COVID-19 on prehospital HCWs may be different from other professions, like nurses and doctors, mainly due to their respectively different work environments. Therefore,

research in the psychological influence of COVID-19 on Emergency Medical Services (EMS) is imperative to prevent long-term mental health and promote mental resilience.

This study seeks to investigate the psychological influence and commonly use coping strategies employed by EMS personnel during the COVID-19 pandemic in the Eastern Cape.

Outline of the Procedure: This study will involve a data collection phase using questionnaires that will be disseminated via email.

To participate in this study, you will need to meet the following requirements.

- EMS personnel registered with the Health Professions Council of South Africa (HPCSA).
- EMS personnel employed within the Eastern Cape as healthcare practitioners during the COVID-19 pandemic.

Risk or Discomfort to Participants: There are no physical or emotional risks for you. However, this study may involve psychological influence. Participants may withdraw from the study should they feel noxious or uncomfortable. Please feel free to contact the South African open counseling should you need anyone to talk. This is a free telephone counseling hotline, operating 24hours (0861 322 322). Or visit their website on https://www.opencounseling.com/hotlines-za.

Reason/s why the participant may be withdraw from the study: Participation is voluntary; therefore, participants may withdraw at any time during the study.

Benefits: This study will identify mental and physical stressors that may cause short-and-long-term psychological effects. This will help managers, policymakers, and the government develops support systems to help reduce or mitigate stressors and promote the well-being of EMS personnel.

Remuneration: You will not be receiving any money for participating in this study

Cost of the Study: All costs associated with this study will be covered by the researcher.

Confidentiality: All personal information will be confidential, and all results obtained will only be used for this study.

Research related to injury: No injury is expected during this study.

Person to contact in the event of problem or queries:

Please feel free to contact the researcher, Patrick Mfanafuthi Mavuso (+971 56 177 8230, mavusopm@yahoo.com or WhatsApp 072 998 3152) or my supervisor Professor Raisuyah Bhagwan (031 3732197 or bhagwanr@dut.ac.za)

Complaints can be reported to the Director: Research and Postgraduate Support Dr. L Linganiso (031 373 2577 or researchdirector@dut.ac.za)

Annexure B: Consent form

DUT DURBAN UNIVERSITY OF TECHNOLOGY

CONSENT

Statement of Agreement to Participate in the Research Study:

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

Full Name of Participant **Date** **Time** **Signature/Thumbprint**

I, Patrick Mfanafuthi Mavuso herewith confirm that the above participant has been fully informed about the nature, conduct and risks of the above study.

Full Name of Researcher **Date** **Signature**

Full Name of Witness (If applicable) **Date** **Signature**

Full Name of Legal Guardian (If applicable) Date **Signature**

Annexure C: Gate keeper's permission letter

Province of the
EASTERN CAPE
HEALTH

Enquiries: Yvonne Gixela Tel no: 079 074 0859

Email: Yvonne.Gixela@echealth.gov.za / yqixela@gmail.com

Date: 13 June 2022

The psycho-social challenges of working at the forefront of the COVID-19 pandemic: a survey of emergency care services personnel in the Eastern Cape EMS. (EC_202205_005)

Dear Mr. P.M. Mavuso

The department would like to inform you that your application for the above mentioned research topic has been approved based on the following conditions:

1. During your study, you will follow the submitted protocol with ethical approval and can only deviate from it after having a written approval from the Department of Health in writing.

2. You are advised to ensure, observe and respect the rights and culture of your research participants and maintain confidentiality of their identities and shall remove or not collect any information which can be used to link the participants.

3. The Department of Health expects you to provide a progress update on your study every 3 months (from date you received this letter) in writing.

4. At the end of your study, you will be expected to send a full written report with your findings and implementable recommendations to the Eastern Cape Health Research Committee secretariat. You may also be invited to the department to come and present your research findings with your implementable recommendations.

5. Your results on the Eastern Cape will not be presented anywhere unless you have shared them with the Department of Health as indicated above.

Your compliance in this regard will be highly appreciated.

[redacted]

SECRETARIAT: EASTERN CAPE HEALTH RESEARCH COMMITTE

2030 NDP

TOGETHER, MOVING THE HEALTH SYSTEM FORWARD

Annexure D: Institutional research ethics approval

Institutional Research Ethics Committee
Research and Postgraduate Support Directorate
2nd Floor, Berwyn Court
Gate 1, Steve Biko Campus
Durban University of Technology

P O Box 1334, Durban, South Africa, 4001

Tel: 031 373 2375
Email: lavishad@dut.ac.za
http://www.dut.ac.za/research/institutional_research_ethics

www.dut.ac.za

13 June 2022

Mr P M Mavuso
530 Binghatti Stars
Silicon Oasis
Dubai
United Arab Emirates

Dear Mr Mavuso

The psycho-social challenges of working at the forefront of the COVID-19 pandemic: a survey of emergency care services personnel in the Eastern Cape EMS
Ethical Clearance number IREC 011/22

The Institutional Research Ethics Committee acknowledges receipt of your final data collection tool for review.

We are pleased to inform you that the data collection tool has been approved. Kindly ensure that participants used for the pilot study are not part of the main study.

In addition, the IREC acknowledges receipt of your gatekeeper permission letter.

Please note that FULL APPROVAL is granted to your research proposal. You may proceed with data collection.

Any adverse events [serious or minor] which occur in connection with this study and/or which may alter its ethical consideration must be reported to the IREC according to the IREC Standard Operating Procedures (SOP's).

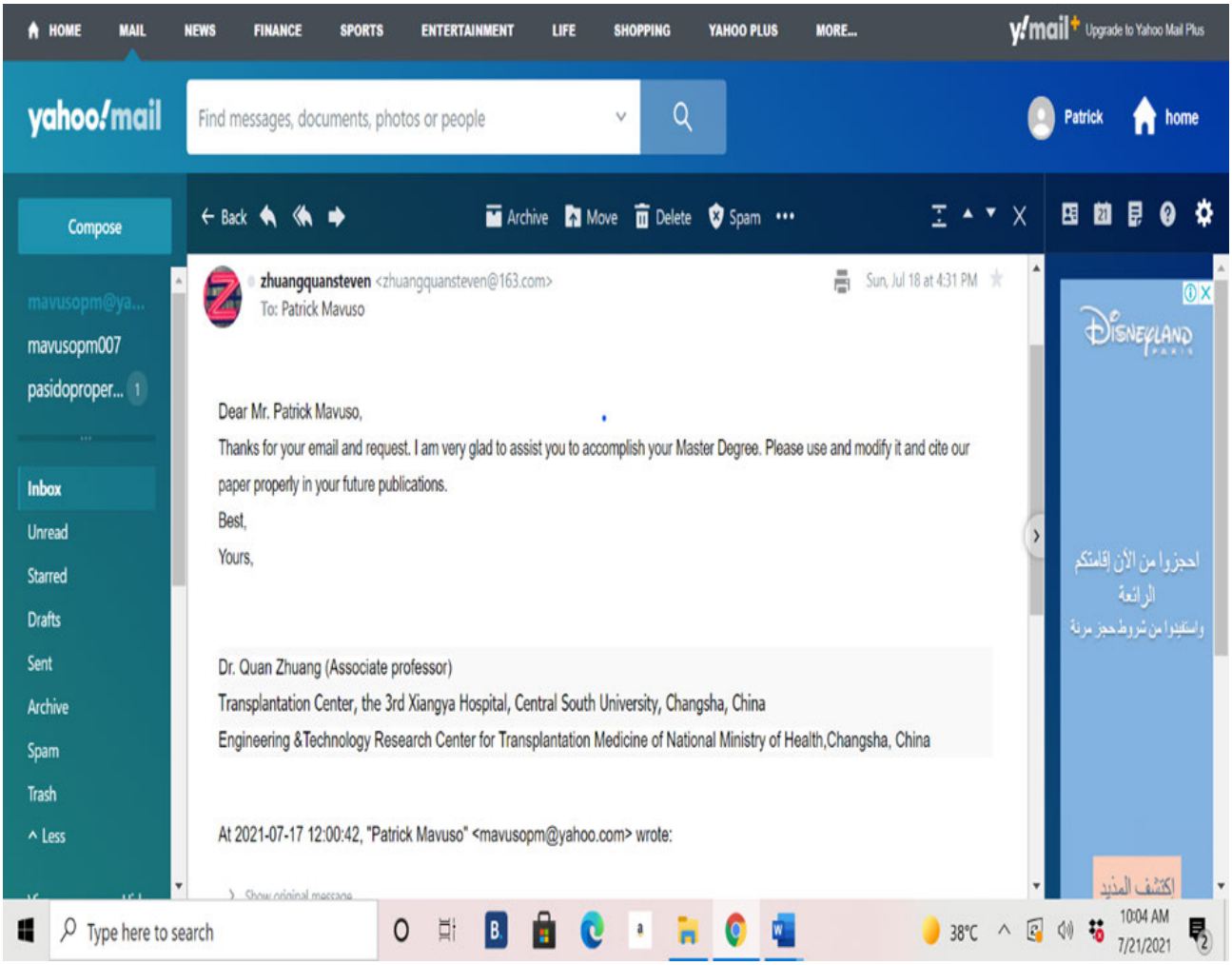
Please note that any deviations from the approved proposal require the approval of the IREC as outlined in the IREC SOP's.

Yours Sincerely,

[redacted]

Prof J K Adam
Chairperson: IREC

Annexure E: Permission granted by the authors to adapted and modify questionnaires from their published research article.



Annexure F: Online questionnaire

Online Questionnaire

Section A

Please mark the appropriate box with an [x]

Demographic details.

1.	Please select your gender	
	Male	
	Female	
	Other	
2.	Please select your age category	
	18-24	
	25-34	
	35-44	
	45-54	
	55-64	
	65+	
3.	Marital status	
	Married and living with my partner	
	Not married but living with my partner/spouse	
	Single	
4.	Do you have kids	
	Yes, and they live with me	
	Yes, but they do not live with me	
	No	
5.	Smoking status	
	Current smoker	
	Non-smoker	
	Ex-smoker	
6.	Any known Medical Conditions	
	None	
	Asthma/COPD	
	Heart disease (i.e., coronary artery disease/hypertension)	
	Diabetes mellitus	
	Other	

7.	Number of years within EMS	
	0-3 years	
	4-7 years	
	8-11 years	
	12-15 years	
	16 years +	
8.	Please select the nature of your organisation	
	Public sector (Government)	
	Private sector	
9.	Which district/Metropolitan do you work in	
	Afred Nzo	
	Amathole	
	Buffalo City	
	Chris Hani	
	Joe Ggabi	
	Nelson Mandela Bay	
	OR Tambo	
	Sarah Baartman	
10.	Current area of speciality	
	Operational	
	Academic	
	Management	

Section B

Please mark the statement that you most agree with an [x]

My feelings during the COVID-19 outbreak

	Question/Statement	Not at all	Slight	Moderate	Very Much
1.	I think that my EMS job comes from a social and moral responsibility. (My job is a calling)				
2.	When I am working in the ambulance, I feel frightened and nervous most of the time.				
3.	I was unhappy about working overtime				
4.	I expect recognition for my work from the EMS management team				
5.	I expect to receive bonus compensation during or after the outbreak				
6.	I try and reduce exposure to patients who are suspected or confirmed with COVID-19				

7.	I want to stop working at my current job				
8.	I think EMS personnel who have not been exposed to COVID-19 should reduce their contact with me				
9.	I want to be able to work in an ambulance that doesn't deal with COVID-19 patients				
10.	I have noticed that my colleagues sometimes avoid sitting at the back of the ambulance with the patient, if they think the patient maybe infected				
11	If the epidemic suddenly gets worse, I will have to quit my job				
12	I feel angry because I get dispatched to more COVID-19 related cases than my colleagues				
13	I want to call in sick				
14	I have been off work at least once				

Section C

Please mark the statement that you most agree with an [x]

Factors that caused me stress during the COVID-19 pandemic.

	Questions/Statement	**Not at all**	**Slight**	**Moderate**	**Very Much**
1.	See my colleagues were infected				
2.	I am worried about infecting my family				
3.	Small mistakes can make me, or others infected				
4.	Taking care of my infected colleagues				
5.	See infected patient die in front of me				
6.	I don't know when the outbreak will be contained				
7.	I am scheduled in the COVID-19 dedicated ambulance most of the time				
8.	Lack of specific treatment				
9.	New or media reports on the number of new cases every day				
10.	I fee exhausted most the time.				

11.	When I see my colleagues' showing symptoms of infections				
12.	When I have some respiratory symptoms of infection				
13.	Constantly having to screen myself for infection.				
14.	I often feel weak and contradictory, between my own responsibility and life safety				
15.	Seeing stress or fear from my colleagues				
16.	Constantly self-screening				
17.	Every day staying in protective clothing for a long amount of time				
18.	I think the current protective measures are still lacking				
19.	Often faced with a lack of more EMS personnel, medical equipment, medical resources				

Section D

Please mark the statement that you most agree with an [x]

Factors that help reduce my stress during the COVID-19 pandemic

Question/ Statement		Never	Sometimes	Often	Always
1.	Positive attitude from my colleagues				
2.	After effective protection measures have been taken, none of my colleagues has been infected with the virus				
3.	My infected patient got better				
4.	My infected colleagues got better				
5.	My station manager provides me with effective safeguards				
6.	The EMS department's correct guidance for infection prevention				
7.	None of my family members are infected and are in a relatively safe state				
8.	Decrease in reported cases				
9.	I get extra financial compensation when I work in the field				
10.	My familiar friends, colleagues, leaders work with me in the fields				

11.	Once I get infected, I trust my colleagues will give me peace of mind				
12.	Joking and chatting with my colleagues				
13.	No overtime				
14.	I receive free lunch, milk tea prepared by the station manager for EMS personnel				

Section E

Please mark the statement that you most agree with an [x]

Personal coping strategies alleviated my stress

Question/Statement		Not at all important	Slightly important	Important	Very important
1.	Follow strict protective measures, such as hand washing, masks, face masks, protective clothing, etc.				
2.	Every fever patient may be infected with COVID-19, even if they did a PCR test a few days/weeks ago				
3.	Learn about COVID-19, its prevention and mechanism of transmission				
4.	Choose a more single mode of travel, such as self-driving, and avoiding public transportation such as minibus (taxi)				
5	Do some leisure activities in my free time, such as watching movies, reading, etc.				
6.	Chatted with my family and friends to relieve stress and obtain support				
7.	Talking to myself and motivation to face the COVID-19 outbreak with positive attitude				
8.	Seek help from a psychologist				

9.	Avoiding doing overtime to reduce exposure to COVID-19 patients in the ambulance.				
10.	Avoiding media news about COVID-19 and related fatalities				
11.	Venting emotions by crying, screaming etc.				

Section F

Please mark the statement that you most agree with an [x]

Motivational factors to encourage continuation of work in future outbreaks

Question/Statement		Not at all important	Slightly important	Important	Very important
1.	The same adequate personal protective equipment that was supplied by my employer				
2.	Effective treatment for the disease or application of vaccines				
3.	Family support				
4.	Reliable social media sources (no fake news)				
5	Compensation to family if disease related infection or death at work				
6.	Reduce working hours and more flexible scheduling during epidemics				
7.	The employer's financial support				
8.	Employer providing psychological support				
9.	Reduced overtime				