

**PREVALENCE OF PTSD, DEPRESSION AND ANXIETY DISORDER AMONG
PARAMEDICS IN NAIROBI COUNTY.**

**THESIS PRESENTED IN PARTIAL FULFILMENT FOR THE AWARD OF MSc
CLINICAL PSYCHOLOGY DEGREE
UNIVERSITY OF NAIROBI
COLLEGE OF HEALTH SCIENCES
SCHOOL OF MEDICINE
DEPARTMENT OF PSYCHIATRY**

BY

WAMBUA REDAMPTER MBUU NDUKU

H56/12031/2018

JULY 2023

DECLARATION

DECLARATION

I declare that this work is original and has been authored by me. It has not been submitted for an academic award or qualification in any institution of higher learning. Appropriate referencing has been made when citation of other people's work has been done.

Author

Wambua Redampter Mbuu Nduku

Signature:



Date: 18-07-2023

STATEMENT OF APPROVAL

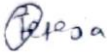
This work has been brought together and reviewed under our supervision as University of Nairobi, Department of Psychiatry lecturers.

1. DR. TERESIA MUTAVI

Senior Lecturer

Department of Psychiatry,

University of Nairobi

Signature: 

Date: 18-07-2023

2. DR. ANNE MBWAYO

Senior Lecturer

Department of Psychiatry,

University of Nairobi

Signature: 

Date: 18-07-2023

Acknowledgement

This dissertation would not have been possible without the guidance and the help of individuals whose unwavering support and guidance have been instrumental throughout my study program.

First and foremost, I would like to extend my deepest appreciation to my supervisors, Dr. Mutavi and Dr. Mbwayo. Their expertise, mentorship, and constant encouragement have been invaluable in shaping my academic journey. I am truly grateful for their commitment, patience, and dedication to my growth and development.

I am also immensely grateful to my colleagues, for their collaboration and camaraderie throughout this program. Our shared experiences, discussions, and collective pursuit of knowledge have contributed significantly to my personal and academic growth. Their support and friendship have made this journey even more meaningful and rewarding.

My appreciation goes to my family for their unwavering love, encouragement, and understanding. Their constant support and belief in me have been a source of strength during challenging times. I am forever grateful for their sacrifices, patience, and unwavering confidence in my abilities. Their unconditional love and support have been the driving force behind my achievements.

Finally, I would like to thank all the participants in the study. Without them, nothing would have been written on this paper.

ABSTRACT

Introduction: During the past decade, there has been a significant rise in EMS missions and the availability of resources such as ambulances, with an increase of up to 64% and 12% respectively. These increased missions undertaken by paramedics have been linked to a higher prevalence of mental health issues, including PTSD and depression. Existing studies have highlighted that paramedics experience higher rates of mental health problems compared to other rescue workers and the general population. The prevalence rates of mental health conditions among paramedics are concerning. Existing studies have shown rates of 14.6% for PTSD, 15% for depression, 15% for anxiety, and 27% for general psychopathology. These figures indicate a significant burden of mental health challenges within the paramedic profession. Several factors contribute to these increased risks. Paramedics frequently encounter traumatic events, exposing them to repeated stressors that can accumulate over time. Additionally, challenging working conditions and unfavourable environments can further predispose paramedics to mental health difficulties.

Purpose: The aim of this study was to investigate the prevalence of PTSD, depression, and anxiety disorders among paramedics in Nairobi County.

Method: The study used quantitative method and cross-sectional design. The data was collected among 39 paramedics who were aged 18 and above working at AMREF, AAR, and St. John's Ambulance. The participants in each of the organizations were recruited using convenience sampling. The collection of data took place only after the acquisition of informed consent. A sociodemographic questionnaire was used to collect sociodemographic characteristics of the paramedics. Paramedics underwent the administration of PCL-5, PHQ-9, and BAI assessments in order to assess the prevalence and severity of PTSD, depression, and anxiety disorders. Furthermore, the study had the aim of investigating the connection between social demographic characteristics and the prevalence of PTSD, depression, and anxiety disorders among paramedics.

Data analysis: The questionnaire was presented to participants as hard copies. On completion, the raw data was transformed into an excel spreadsheet after which it was uploaded into IBM SPSS version 26 software. Data was then cleansed and analyzed using IBM SPSS version 26 software. Participant characteristics were presented by use of frequencies and percentages for the categorical variables. Bivariate analysis was conducted using fisher's exact test for categorical comparisons and nonparametric tests for continuous variables to identify any associations between the disorders and participants' characteristics. Prevalence of the mental health disorders were classified in a binary category based on literature-defined cut-offs of ≥ 10 for depression, ≥ 31 for PTSD and ≥ 22 for anxiety. The prevalence of PTSD, depression and anxiety was presented in graphical and tabular formats. Statistical significance was taken at $p < 0.05$.

Results: This study found a prevalence rates of 12.8% for PTSD, 17.9% for depression and 5.1% for anxiety disorders among the paramedics examined. The study has not revealed any significant differences in PTSD, depression, and anxiety disorders with regards to sociodemographic characteristics

Study utility: Addressing the mental well-being of paramedics is crucial. Efforts should focus on implementing strategies to mitigate the risks associated with their profession. Providing adequate support systems, including access to mental health services, debriefing sessions, and training programs, can help paramedics cope with the psychological impact of their work. In addition, promoting a supportive and positive work culture that emphasizes self-care and stress management is essential for reducing the prevalence of mental health challenges among paramedics.

LIST OF ACRONYMS

AMREF	Africa Medical and Research Foundation
BAI	Becks Anxiety Inventory
DSM-5	Diagnostic and Statistical Manual of Mental Disorders, fifth edition
EMS	Emergency Medical Services
EMT	Emergency Medical Technician
EU	European Union
KCEMT	Kenya Council of Emergency Medical Technicians
LEC	Life Event Checklist
MDD	Major Depressive Disorder
NACOSTI	National Commission for Science, Technology and Innovation
PCL	Post-Traumatic Stress Disorder Checklist
PHQ	Patient Health Questionnaire
PTSD	Post-Traumatic Stress Disorder
PTSS	Post-Traumatic Stress Symptoms
SPSS	Statistical Package for the Social Sciences
UK	United Kingdom
UON	University of Nairobi
USA	United States of America

OPERATIONAL DEFINITIONS

- Anxiety** A mental health condition where individuals exhibit excessive and inappropriate worry, about several events or activities leading to distress or impairment in occupational, social, or other important areas of functioning.
- Comorbidity** Comorbidity refers to the presence of two or more coexisting medical conditions or disorders in an individual.
- Critical incidents** Critical incidents are work-related events that have the potential to be traumatic for individuals involved. These incidents often involve situations where individuals face a threat of injury, sexual assault, or death while performing their work duties. These traumatic events can have a significant psychological impact on the individuals who experience them, potentially leading to post-traumatic stress disorder (PTSD) or other mental health challenges.
- Cumulative Trauma** Cumulative trauma refers to the psychological, emotional, and physical distress that can occur as a result of repeated exposure to potentially traumatic events, whether directly or indirectly, during the course of one's work. This type of trauma is not typically attributed to a single traumatic incident but rather accumulates over time due to the repeated exposure to stressful or traumatic situations. It can affect individuals in high-stress professions, such as emergency responders, healthcare workers, and military personnel, who frequently encounter distressing or traumatic events in their line of work.
- Depression** Depression is a mental health disorder characterized by persistent feelings of sadness, low mood, or a loss of interest or pleasure in activities that were once enjoyable. In addition to these core symptoms, individuals with

depression may experience a range of other symptoms that can significantly impact their daily lives.

Emergency Medical Services

EMS (Emergency Medical Services) is a system that encompasses the organization and coordination of all aspects of care provided to patients in the prehospital environment. It is designed to respond to medical emergencies and provide immediate medical attention and transportation to individuals in need. EMS involves a team of healthcare professionals, including paramedics, emergency medical technicians (EMTs), and other specialized personnel, who are trained to provide emergency medical care on the scene of an incident or during transport to a medical facility.

First Responders

First responders, or the first personnel to arrive at the scene of a disaster or emergency, play a critical role in providing immediate emergency medical assistance. These individuals are often trained professionals, such as paramedics, emergency medical technicians (EMTs), firefighters, or police officers, who are equipped with the necessary skills and knowledge to respond to various types of emergencies.

Paramedic

A paramedic is a healthcare professional who works independently in various healthcare settings, typically in primary or urgent care and emergency care but is not a trained nurse or doctor. Paramedics are trained to provide immediate medical care to patients in emergency situations, both in the prehospital setting and within healthcare facilities.

Posttraumatic Stress Disorder

Is a mental health condition characterized by a specific stressor; the experience or witnessing a traumatic event or repeated exposure to details of a traumatic event capable of leading to death, serious injury or sexual violence. Key features of PTSD include intrusive and avoidance symptoms, negative alteration in cognition and mood and marked alteration in arousal

and reactivity associated with the traumatic events. Occurring one month after the exposure leading to distress or impairment in daily functioning.

Prehospital Care

Prehospital care refers to the medical care and treatment provided to individuals in need while they are being transported to a hospital or healthcare facility. It is the initial care provided by healthcare professionals, such as paramedics or emergency medical technicians (EMTs), at the scene of an emergency or during transportation to a medical facility.

Stress

Stress can be defined as any type of change or demand that triggers physical, emotional, or psychological strain or pressure on an individual. It is a natural response that occurs when individuals perceive a situation or event as challenging, overwhelming, or threatening to their well-being or equilibrium.

Trauma

Trauma refers to the emotional and psychological response to a distressing or terrifying event that poses a threat to an individual's physical or psychological well-being. Traumatic events can vary widely and may include accidents, natural disasters, acts of violence, abuse (including sexual abuse), or other life-threatening situations.

TABLE OF CONTENTS

Acknowledgement	iv
ABSTRACT.....	v
LIST OF ACRONYMS	vi
OPERATIONAL DEFINITIONS.....	vii
TABLE OF CONTENTS.....	x
LIST OF TABLES	xiii
LIST OF FIGURES	xiv
CHAPTER ONE	1
1.1 Introduction.....	1
1.2 Background of the study	1
1.3 Problem statement.....	7
CHAPTER TWO: LITERATURE REVIEW	9
2.0. Introduction.....	9
2.1.1. PTSD.....	9
2.1.3. DEPRESSION	13
2.1.4. ANXIETY	14
2.1.5. Sociodemographic Characteristics of Paramedics	15
2.2.2 The prevalence and severity of PTSD, depression, and anxiety disorders among paramedics	18
2.2.3 Association of sociodemographic characteristics and PTSD, depression, and anxiety among paramedics.....	26
2.3.1 Theoretical Framework: The Transactional Model of Stress and Coping by Lazarus	30
2.4 Conceptual Framework.....	33
2.5: Significance and justification of the Study	35
2.6: Research Question	37
2.7 Main Objective.....	37
2.8. Specific Objectives	37
2.9. Research Questions.....	38
2.9. Assumptions of the study.....	38
CHAPTER THREE: RESEARCH METHODS	39
3.1 Introduction.....	39
3.2 Study design.....	39

3.3 Study site.....	39
3.4 Study population	41
3.5 Sample size calculation.....	42
3.6 Sampling procedure	44
3.7 Recruitment, acquisition of consent and procedure of data collection	44
3.8 Variables	46
3.9 Data collection tools	47
3.9.1 Socio-demographic Questionnaire.....	47
3.9.2 Patient Health Questionnaire (PHQ-9)	48
3.9.3 PTSD checklist civilian version (PCL-5 Short-Form).....	49
3.9.4 Beck Anxiety Inventory	49
3.10 Quality Assurance Procedures.....	50
3.11 Ethical consideration.....	51
3.11.1: Ethical Approval	51
3.11.2: Obtaining Informed Consent	52
3.11.3: Potential Benefits of the Study	52
3.11.4: Potential Risks of the Study.....	53
3.11.5: Confidentiality	55
3.11.6: Voluntary Participation.....	55
3.11.7: Monetary Benefit	56
3.11.8: Study Results Dissemination	56
3.12: Study limitations and Measures to Address Them	56
3.13 Data analysis	58
CHAPTER FOUR: RESULTS	59
4.1 Introduction.....	59
4.2 Participant Characteristics	59
4.3 The Levels and Severity of PTSD, Depression and Anxiety Disorders	61
4.3.1 Overall prevalence of depression, PTSD and anxiety disorders.....	61
4.3.2: Severity level of depression, PTSD and anxiety disorders.....	62
4.3.3 Comorbidity of depression, PTSD and anxiety disorders.....	63
4.3.4 Depression variables	64
4.3.5. PTSD Variables	66
4.3.6. Anxiety Variables	68
4.3.7. Mental Health Scores	70
4.4. Association between sociodemographic characteristics and PTSD, Depression and Anxiety disorders	71
4.4.1. Factors Associated with Mental Health Scores	71

4.4.2: Factors associated with PTSD, Depression, Anxiety and general mental health ..	72
CHAPTER FIVE: DISCUSSION.....	74
5.0 Introduction.....	74
5.1 Sociodemographic Characteristics of Paramedics	74
5.2 Prevalence Rates and Severity of PTSD, Depression and Anxiety Disorders.....	75
5.3 The Association Between Sociodemographic Characteristics, PTSD, Depression and Anxiety Disorders among Paramedics.....	77
5.3.1 PTSD Outcome	77
5.3.2. Depression Outcome.....	78
5.3.3 Anxiety Outcome	79
5.4. Limitations and strengths of the study	79
5.5. Conclusions.....	81
5.6. Recommendations.....	82
REFERENCES	84
APPENDIX I: STUDY QUESTIONNAIRES.....	95
PART ONE	95
PART TWO	97
PART THREE	98
PART FOUR.....	100
APPENDIX II: INFORMED CONSENT.....	101
APPENDIX III: Study timeline	103
APPENDIX IV : Budget and Budget Justification	104

LIST OF TABLES

Table 3.5. 1 Sampling Frame.....	43
Table 4.2 1 Sociodemographic Characteristics.....	60
Table 4.3. 1 Depression variables among respondents	Error! Bookmark not defined.
Table 4.3.4. 1Depression variables among respondents	65
Table 4.3.5 1: PTSD Variables among respondents	68
Table 4.3.6 1Anxiety Variables among respondents	69
Table 4.3.7 1Mental Health Scores.....	70
Table 4.4. 1Factors Associated with Mental Health Scores	72
Table 4.4. 2 Factors associated with PTSD, Depression, Anxiety and general mental health	73

LIST OF FIGURES

Figure 1 Conceptual Framework	35
Figure 2: Recruitment and Data Collection Flowchart.....	45
Figure 4.3. 1 prevalence rates of depression, PTSD and anxiety disorders.....	61
Figure 4.3. 2 Number of mental health problems	62
Figure 4.3. 3 Severity levels of PTSD, depression and anxiety disorder.....	63
Figure 4.3. 4 Overlap of mental health problems	64

CHAPTER ONE

1.1 Introduction

This chapter presents the background of the study, and the problem statement.

1.2 Background of the study

Eaton (2019) defines a paramedic as a general clinician who operates independently across various healthcare settings. The primary responsibility of paramedics is to provide and organize the response for out-of-hospital pre-hospital care or pre-hospital or out-of-hospital care within their local communities. Nevertheless, this paramedicine profession has been argued to be perhaps the most unrecognized profession within the medical field. Their impact on community services, acute care, hospital emergency department tensions, and resource demands overshadows their contribution to the health and wellbeing of the community and to healthcare (Phoenix Australia, 2019). However, paramedics do not undergo the extensive education, training and preparation as nurses or doctors do (Eaton, 2019).

Emergency and paramedical teams rather referred to as first responders are normally among the first personnel to respond to a disaster and offer emergency medical services (Domestic Security, 2010). Different terms in different jurisdictions and countries are used to refer to first responders. These terms would include Emergency Medical Personnel, Emergency Medical Technician (EMT), Paramedics, Call-takers, and Emergency Dispatch Personnel. They are mainly responsible for pre hospital care or out of hospital care in the communities (Lawn, Roberts, & Willis, 2020).

Since many terms and connotations have been used to describe paramedic and ambulance personnel, Petrie et. al., (2018) endorsed a more inclusive definition of these workers. They

went on to state that, ambulance personnel included, ambulance workers, Emergency Medical Technicians, paramedics, and all other people who during accidents and emergency medical crisis offer transport and emergency medical care out of and enroute to the hospital on a day-to-day basis.

Worldwide, mental health disorders among paramedics have been established to be high in comparison to prevalence in the general population or among other rescue workers such as the police, firefighters, and call center operators (Carleton et. al., 2018). Studies show prevalence rates of general psychopathology, anxiety, depression and PTSD among paramedics to be as high as 27%, 15%, 15% and 11% respectively (Petrie et. al., 2018), in comparison to the general population where prevalence rates of PTSD, depression, and anxiety have been cited to be 3.7-5.1%, 4.4% and 3.6% respectively (baker, 2018 & WHO, 2017). Adding to that, (Berger et. al., 2012) found collective prevalence rates of PTSD among emergency service personnel at 10% in comparison to prevalence rates of 1.3–3.5% in the general population. Rates of suicide which is related to depression among paramedics is also higher compared to occurrence among the general populations (Vigil et. al., 2019).

Paramedics, as with other Emergency Medical Service personnel, frequently encounter work-related traumatic events referred to as critical incidents (Carleton et. al., 2018). Critical incidents have been defined as work related experiences which have the potential to be traumatic in nature. They mostly include circumstances whereby, the persons encounter threatened injury, sexual assault or death as a result of duties related to their work (APA, 2013).

Greinacher et. al., (2019) also reports that more than 80% of paramedics admitted they had encountered an “exceptionally traumatic event” within a period of six months. Furthermore, in

addition to being exposed to violence and abuse, they are exposed to operational and organizational stressors, chronic pain, sleep quality deprivation, fatigue, among other stressors like conflict at work and shift work (Donnelly et. al., 2016 & National Coronial Information System, 2015). Exposure to such situations have been linked to escalated risk for emergence of psychiatric conditions like posttraumatic stress disorder, major depressive disorder, social anxiety disorders, panic attacks and general anxiety disorder (APA, 2013 & Bonde et. al., 2016). In addition, these situations impact the mental wellbeing of paramedics negatively which consequently affect their personal life, quality of life and productivity at work in general (Lawrence et. al., 2018 & Wild et. al., 2016). For instance, Donnelly et al., (2016), research in USA among Canadian EMTs and paramedics showed a direct relationship between stress caused by operational as well as organisational characteristics of the place of work and posttraumatic stress disorder symptoms. They concluded that, although being exposed to traumatic experiences is a prerequisite factor in occurrence of PTSD, stress load also contributes to development of PTSD symptomatology.

However, Petrie et. al., (2018), points out that anxiety and depression disorders could occur in the absence of critical incident exposure but also extremely co-occur with PTSD (APA, 2013). In addition, anxiety disorder and depression have been cited as predictors of severity of PTSD among emergency work. That is, depression and anxiety tend to increase the severity of PTSD. However, not all paramedics who have been exposed to traumatic experiences and other stressors at work suffer from PTSD, depression and anxiety disorders. For instance, Fjeldheim et. al., (2014) study reports prevalence rates of exposure to traumatic experiences as 94% out of which, only 28% and 16% met depressive and PTSD diagnostic criteria. This, is because when pre-existing appraisal of life events is negative, stressors tend to escalate the already existing negative appraisal of life experiences (Kerai et. al., 2017).

More so, in recent years, EMS missions and provision of resources such as ambulance have increased to a rate of up to 64% and 12 % respectively within a 10year period (Prucker S, 2017). These missions by paramedics have been cited as responsible for increased prevalence of PTSD and depression among other conditions (APA, 2013) among paramedics. Research has shown that 69% of Emergency Medical Service personnel have hardly had adequate time to recuperate from terrifying experiences (Bentley et. al., 2013) and that emergency work is one of the most exhausting occupations in the worlds. Compared with 20% of the general population, 30% of emergency service personnels are estimated to develop behavioral health conditions like depression, and post- traumatic stress disorder (PTSD) among other mental conditions (Abbot et al., 2015). Due to the impact of these mental disorders, some nations such as Germany and the EU countries have recognized PTSD and depression as occupational accidents among paramedical workers (Nienhaus, 2016). In other nations like Netherlands, France, and Sweden depression has been acknowledged as an occupational disease while PTSD has been acknowledged as an occupational disease in Denmark (Netherlands center for occupational diseases, 2015).

Working in an environment where one is routinely exposed to highly traumatic situations or rather critical incidents in Emergency Medical Service line of work is capable of leading to PTSD, depression, and anxiety (Xue et al., 2015). Specifically, paramedics come in contact with trauma on daily basis in the cause of their work because they work to rescue people who are injured, in danger and most of the time they observe people die in the course of their duty (Donnelly, 2012). Further, because of the high amount of stress experienced by emergency staff, they are more likely to suffer from cumulative stress. If not sufficiently addressed, the exposure could lead to emotional trauma and related dysfunction (Mildenhall, 2019). Donnelly

(2012) further views recurrent exposure to stressors as what could predispose paramedic personnel to develop reactions to stress like PTSD and burnout.

Mitchell et. al., (2017) explains that both individual and organization specific factors like exposure to suffering and trauma have been identified as having the potential to contribute to the elevated risk. Additionally, because of the high amount of stress experienced by emergency staff, they are more likely to suffer from cumulative stress. Consequently, if not sufficiently addressed, it could lead to emotional trauma and related dysfunction (Cunha, Soares-Oliveira, & Pereira, 2009).

Adding to that, Donnelly (2012) identifies a variety of work-related factors that emergency medical service (EMS) personnel are subjected to. These include critical events linked to persistent work-related difficulties in the provision of patient care. He further views repeated exposure to stressors as what could put EMS personnel at risk of developing reactions to stress like PTSD and burnout. Additional instances are (direct or indirect) exposure to death, injury, grief, loss, pain, and directly being exposed to a threat to personal safety. More examples include frequent shifts, poor sleep, longer shift hours, poor sleep, and physical hardships, long hours of work, and many other negative encounter (Botha et. al., (2015); Heavy et. al., (2015); Patterson et. al., (2012); Quevillon et. al., (2016).

For instance, a systemic review of qualitative studies using 39 articles conducted by Lawn et. al., (2020), looking at the outcome of emergency medical work on the social, physical and psychological social well-being of ambulance personnel (paramedics, ambulance volunteers, ambulance officers and call-takers) identified a number of factors that could contribute to the mental health and wellbeing of ambulance personnel present in how the organization

management acknowledges and responds to as well as factors present in their day-to-day work. These factors were also noted to have the potential to exacerbate the probability of suffering from mental health conditions like Depression, Anxiety and PTSD. This study came to the conclusion that the physical, social, and psychological health of ambulance staff is significantly impacted by workplace culture, demands, and critical incidents. These include the effects of shift work, regular managerial responses and actions, lengthy workdays with little downtime, and poorly managed rosters.

Past researchers have already examined the existed of PTSD, anxiety and depression among paramedics in various places globally and came up with various findings. Clohessy & Ehler, (2010) examined 56 ambulance workers and found out that 21 of the participants had PTSD, while 22 participants had symptoms for general psychopathology.

In Kenya, emergency care services are normally controlled and organized by either, humanitarian organizations, private companies or the government (NHTSA, 2004). Although the profession is young, it has continued to grow with increased training of EMTs and paramedics. Even with research having shown that emergency work has an exacerbated risk of developing PTSD, anxiety disorders and depression, among other mental conditions, few research assessing their mental wellbeing has been done in Africa. Globally, research to date has mostly paid attention to frequent exposure to trauma, therefore centering on PTSD, with anxiety and depressive disorders not well studied. Hence, this research seeks to establish the prevalence of PTSD, depression, and anxiety disorders amongst paramedics within Nairobi County.

1.3 Problem statement

Depression, anxiety, stress and trauma is common in high-risk work. Post-traumatic stress disorder (PTSD) is commonly known to occur as a comorbid condition with other mental illnesses such as drug abuse, alcohol dependence, depression, suicide, and anxiety among multiple healthcare personnel (Cottler et. al., (2013).

According to Berger et. al., (2012), post-traumatic stress disorder (PTSD) is admittedly known as a potential cause of mental health issue resulting from exposure to stress and trauma in emergency work. Numerous studies and reviews have reported prevalence rates of PTSD in this context Research show that, there is a high comorbidity of psychiatric conditions as a result of exposure to trauma (Maercker & Hecker, 2016). More so, epidemiologic literature consistently shows in particular the co-occurrence of PTSD and depression (Gradus, 2017).

Thus, amidst first responders (paramedics/EMS, firefighters, police officers, physicians, and nurses) PTSD has firmly been established as an occupational risk. The impact of PTSD has been predicted to lead to diminished quality of care, high staff turnover, lost workdays, and burnout (Carleton et. al., 2018). Additionally, higher burden of cumulative trauma was found to increase rates of anxiety as well as depression (Harvey et. al., 2016). More so, as reported by Wagner et. al., (2020) the prevalence rates of PTSD, depression, together with anxiety disorder are increased in paramedical service workers.

Since repeated exposure to life-threatening and traumatic events is a main aspect in emergency work, its comprehensible that, majority of researches investigating mental wellbeing of this profession has centered on PTSD (Petrie et. al., 2018). Nonetheless, PTSD represents only one possible consequence of repeated stress and trauma in emergency work. Thus, literature

available has concentrated on prevalence rates of PTSD compared to prevalence rates of depression as well as anxiety disorders (Berger et. al., 2012). This limited data can lead to underestimation of the magnitude of psychiatric burden experienced by Emergency Service Personnel (Skeffington et. al., 2017).

Further, although this topic has largely been investigated internationally. In the African region, only minimal studies exist in East Africa and Kenya. Hence this study will fill this gap by exploring the prevalence of PTSD in paramedics in addition to depression and anxiety disorders.

CHAPTER TWO: LITERATURE REVIEW

2.0. Introduction

This chapter presents the literature review, theoretical and conceptual framework, significance and justification of study, research objectives and questions, and assumptions of the study.

2.1.1. Brief History of Paramedicine

Emergency care dates back to World-War 1. A British surgeon called Thomas showed that in the field, basic precautions might help take care of lives and limbs (rang, 1966). Napoleon and his generals invented the means of transferring wounded soldiers from the battlefield to dressing stations, giving rise to the contemporary style of pre-hospital care (McKenny, 1967). Emergency medical services are often controlled and supervised by either the government, humanitarian organisations, or private businesses around the world, including in Kenya (Huemer et al., 1994; NHTSA, 2004).

Emergency medical services (EMS) are classified as either Basic Life Support (BLS) which forms the basis of training, or Advanced Life Support (ALS) which is an enhancement of BLS through acquiring advanced training (Sayre et al., 2011). Therefore, ascent in scope of practice in emergency care begins as a first responder, followed by emergency medical technician basic level (EMT-B), to emergency medical technician level one (EMT-1) and finally paramedics in that order.

In Kenya, the need for training of EMTs arose after the bombing of the US Embassy in Nairobi in 1998. The first bunch of training in East and Central Africa happened between 1998 and 1999. This was called for due to the fact that rescue services after the bombing were offered by armed forces, firefighters from Nairobi city council, volunteers from St. Johns ambulance,

Red Cross and rescue teams from Israeli Defense Forces. However, rescue teams were only trained as EMT-Bs. The profession has continued to grow to date leading to the birth of Kenya Council of Emergency Medical Technicians (KCEMT). KCEMT is an umbrella body for EMTs in Kenya incorporated in 2009. Their role includes coordination of EMTs in Kenya through education, advocacy, regulatory services of EMTs and oversight for other agencies that provide course training. By 2014, the council was accredited to train BLS, and advanced cardiac life support (ACLF). In 2018 KCEMT partnered with Masinde Muliro University of Science and Technology (MMUST) to run a degree course in Paramedicine (KCEMT, 2022).

The provision of Emergency Medical Services in Nairobi, Kenya, has evolved over the years alongside advancements in medical care, technology, and urbanization. In the early days, ambulance services in Nairobi were relatively basic and often provided by organizations such as the Kenya Red Cross Society and St. John Ambulance. These organizations focused on providing first aid and transport services for injured or ill individuals. As Nairobi grew and urbanized, the need for more organized and efficient emergency medical services became evident. The increasing population density and traffic congestion highlighted the necessity for well-coordinated Emergency Medical Services to provide timely care in emergencies. Further, the Nairobi City County government has taken steps to establish its own ambulance services to address the growing demand for emergency medical care within the city and also collaborates with different healthcare organizations and NGOs, and partners with medical institutions, training centers, and international organizations to contribute to enhancing the quality of care and response capabilities.

Some of the most common medical emergencies in Nairobi County include trauma injuries such as accidents involving vehicles, falls, sports injuries, and other severe injuries like

fractures, head injuries, and spinal injuries, cardiac emergencies such as heart attacks (myocardial infarctions) and cardiac arrests, respiratory distress like severe asthma attacks, chronic obstructive pulmonary disease (COPD), stroke, anaphylaxis and other severe allergic reactions, diabetic emergencies, seizures, poisoning, overdose, pregnancy, mental health episodes. Hence, the need to conduct research looking at the mental health of paramedics in Nairobi, Kenya.

2.1.2. PTSD

According to the DSM-5 post-traumatic stress disorder is a mental health condition characterized by specific criteria. A traumatic event that involves the fear of death, significant injury, or sexual assault is often what causes PTSD when it is experienced or witnessed. Key features of PTSD include the following: Intrusive symptoms: People with PTSD may have frequent, upsetting flashbacks, nightmares, or memories of the traumatic incident. When exposed to cues connected to the event, they may also experience strong psychological or physiological reactions. Avoidance symptoms: People who have PTSD may intentionally avoid things that remind them of the traumatic experience, including thoughts, feelings, locations, people, or activities that are connected to the trauma. They might also experience a decline in their interest for or participation in once-loved activities. Negative alterations in cognition and mood: People who suffer from PTSD frequently hold on to unfavourable expectations or beliefs about themselves, other people, or the world. They might have inaccurate ideas about what led to the traumatic event or what its effects were. Additionally, people may experience recurring unpleasant emotions including fear, horror, rage, remorse, or shame. Changes in arousal and reactivity that are noticeable: People with PTSD may have higher levels of arousal or more heightened response. Instability, irrational outbursts of anger, hypervigilance, an excessive startle reaction, difficulties concentrating, or sleep issues can all

be signs of this. For a diagnosis of PTSD, these symptoms must be present for at least a month and significantly limit social, occupational, or other essential areas of functioning. It's critical to rule out any potential medical conditions or substance use as the cause of the symptoms. (APA, 2013).

Although majority of people who experience a traumatic experience may have temporary challenge coping and adjusting, they normally get better as time passes by especially if they take good care of themselves. However, for some, the symptoms may worsen leading to impaired functioning in daily life. Thus, they could be said to have PTSD (Pai et. al., 2017).

Globally, PTSD contributes largely to the burden of disease. It is believed to affect approximately 4% of the world's population. PTSD persists for over a year in 50% of all cases and often leads to considerable deterioration in functioning and productivity (Ng, Stevenson, & Kalapurakkal, 2020).

According to the anxiety and depression association of America (2014), over 7.7 million Americans over the age of 18 years suffer from PTSD. They define the term PTSD according to the distressing effects that occur after an individual has been coerced to engage in severe distressing events that lead to development of symptoms that are disruptive for the individual over a long period of time.

The incidence of PTSD is increasing worldwide. For instance, 50 to 90 percent of the population as a whole experience trauma, with 7.8 percent of those getting PTSD. According to estimates, women are twice as likely as males to experience PTSD (Kessler, R.C., Sonnega et al. 1995).

A meta-analysis done in sub-Saharan Africa revealed that there is a high prevalence of PTSD most of which results from war and other types of violence (Ng et. al., 2020). Recently, due to COVID-19 pandemic, increased prevalence rates of PTSD of up to 44.5% and 55.1% in South Africa and Kenya respectively were reported especially in healthcare workers (Ntlantsana, et al., 2022).

2.1.3. DEPRESSION

Depression commonly referred to as clinical depression or major depressive disorder, is a prevalent mood disorder. Persons who experience depression have incessant feelings of low mood, lose pleasure in activities they once loved and loss of hope (Tolentino & Schmidt, 2018). Additionally, those who are diagnosed with depression can present with physical symptoms like digestive problems and chronic pain (Maj, 2013). According to National Institute of Mental Health (2015), Depression will interfere with a person's regular functioning and daily activities. When feelings of worthlessness and hopelessness only last for a few days, they are sometimes referred to as passing cases however, if it persists for more than two weeks and interfere with daily activities it is referred to as depressive disorder.

The DSM-5 delineates the symptoms of major depressive disorder criteria as follows: the person must experience at least five symptoms or more within a 2weeks. The person must experience either sadness or lose interest in things they used to love. Other symptoms include; substantial weight changes, sleep disturbance, fatigue, psychomotor retardation or agitation, low concentration or indecisiveness, experiences of inappropriate guilt or worthlessness and repetitive suicide ideations, thoughts of dying or suicide attempts (APA, 2013). More so, the symptoms must impair daily functioning and should neither be a consequence of use of a psychoactive substance nor another medical condition (APA, 2013).

As per World Health Organization (2021), depression is a major disorder globally, it is approximated that 3.8% of the world population is affected by depression. Around 300 million people worldwide suffer from depression. Persistent and untreated depression results in suicide and it is estimated that above eight hundred thousand (800 000) persons lose their lives as a result of suicide yearly (WHO, 2021). According to the World Health Organisation, depression will afflict people of all ages, regardless of where they live, who they are, or how they are positioned in society. By the year 2020, depression is anticipated to rank among the top reasons for disability globally (WHO, 2011). Furthermore, it's believed that more than 75% of people in low and middle income countries don't get treatment for psychological issues. There are about 29 million cases of depression in Africa. Nigeria is the leading country in Africa with the cases of depression at around 7.1 million cases (WHO, 2017). Kenya has 1.9 cases of depression and this number is assumed to be higher for most of the cases are not reported at any medical facilities and some of those that are reported are misdiagnosed (WHO, 2017). Paramedics contribute greatly to the statistics on depression globally, regionally, and locally. More so, depression is highly reported among first responders, its rate and severity vary across studies.

2.1.4. ANXIETY

The word "anxiety" is frequently used to convey unease, worry, and fear (Marsh, 2015). It takes into account both the feelings and the bodily experiences people could have when they are anxious or worried about something. Anxiety disorder is described as a psychiatric condition where individuals react to some events with dread and fear (Stein & Sareen, 2015). Additionally, one might describe physical signs related to anxiety, like sweating and an increased heartrate. Minimal anxiety is not a bad thing for it might help people in noticing

dangerous situations. It becomes an anxiety disorder when: it negatively affects an individual's daily functioning, when it makes an individual sensitive to triggers eventually affecting their mood, and when one can't control his/her responses to situations (Stein & Sareen, 2015).

According to DSM-5 one can be diagnosed with anxiety disorder when: one exhibits disproportionate fear and worry about several activities, occurring for at least 6 months. The individual is unable to control the worry. For one to be diagnosed with anxiety disorder, they must exhibit three or more of the following signs; problems in concentrating, restlessness, easily fatigued, sleep disturbance, tensed muscle and irritability. These symptoms must cause impairment in functioning or substantial distress and must not be attributable to a substance or medical conditions (APA, 2013).

According to World Health Organization (2017) at least 264 million adults worldwide have anxiety. Data shows that 40 million adults in the US suffer from anxiety making it the most common psychiatric condition. The meta-analysis study done in Africa in 2021 showed that Africa, had inflated general prevalence rates of anxiety at 47%. In the Region, East Africa had the highest prevalence of anxiety. Kenya was rates at 49% (Bello et al., 2022). Additionally, Korir (2019) meta-analysis study reports prevalence rates 25.1% of anxiety disorder in Kenya.

2.1.5. Sociodemographic Characteristics of Paramedics

Alaqeel, et. al., (2019) conducted a cross-sectional study on 110 male paramedics in Saudi Arabia to identify the association between PTSD and the socio-demographic characteristics. This included their age, duration of service, position at work (Emergency Medical Technicians, paramedics, and others), military experience, social status, and marital

status. The data demonstrated that majority of participants were EMTs, married, worked less than 10 years and were older than 30years.

Khazaei et. al., (2021) research on the prevalence of PTSD in EMTs among 259 males in Iran and assessed age, work experience, marital status, employment, EMTs degree, training history, and several shifts. They found out that, EMTs who were less than or equal to 30years, had a work experience of less than or equal to 10 years, were married, had informal employment, those working 8 shifts or more per month, those without prior training had higher scores for PCL-5 tool. Those diagnosed with PTSD reported a mean age of 28.88 years. In comparison, those who did not have PTSD had a mean age of 33.77 years. In conclusion, age, marital status, and number of shifts were significantly associated with scores of PCL-5 while no positive relationship was found between work experience, number of missions, employment status, base location, degree, and previous training and scores of PCL-5.

Eiche et. al., (2019) nationwide cross-sectional survey among 2731 paramedics on well-being and PTSD in a Germany EMS found that majority of participants were males, those aged 30years and below and had 0-5 years of experience.

Another web based cross sectional study by Reid et. al., (2022) investigating the posttraumatic stress disorder symptoms and post-exposure modifications in Norwegian ambulance staff.

They examined factors like age, gender, full- or part-time employment, length of employment, professional background (paramedics, EMTs, nurses, trainees), cohabitation, and access to peer support. They found out that prevalence rates of PTSS were elevated in personnel who were unmarried or without a partner and those without access to peer support. They also found that, PTSD was common among women

Kerai et. al., (2017) in their study looked at PTSD and its predictors among 518 EMS personnel in Karachi Pakistan. This study was carried out between February and May in 2014. This study, utilized impact of scale- revised tool to assess for PTSS. They looked at the job type, age, marital status, living status, type of family, years of experience, working hours, formal schooling income, substance use problem, type of trauma, coping style, social support, and family history of mental disorder, and use of medication. Results showed that 53.6% of participants had experienced a traumatic event at work. Additionally, 34.3% of participants had problem with substance use. In conclusion, anxiety, coping style, age and depression predicted PTSS in Emergency Medical Service personnel.

During the COVID-19 pandemic, a meta-analysis study of first responders to medical emergencies looked at stress, depression, and anxiety levels (Huang et. al., 2022). This study found a positive association between marital status and depression and anxiety. According to the study's findings, participants who were married had a higher risk of developing depression and anxiety, whereas participants who were single had a lower risk.

Fjeldheim et. al., (2014) investigated exposure to trauma, PTSS, and other psychopathology in paramedic trainees in South Africa. The assessed variables included gender, age, population group, social support, exposure to trauma, number of total previous trauma exposure, perceived stress, alcohol dependence, depression, and alcohol abuse. They discovered that the likelihood of having had a traumatic incident before, as well as a decline in social support, depression, and lower resilience, all strongly predicted PTSD status.

The above literature review on the social demographic characteristics among paramedics has revealed that several factors influence mental health among paramedics. Some of the factors

found to influence how paramedics develop and handle mental health issues included; age, gender, educational level, working conditions and hours, level of experience, marital status, position at work, and years of service. The literature has shown that various aspects influence PTSD, depression, and anxiety among paramedics, this has exposed the existence of the research problem under study hence the importance of this study to be carried out in Nairobi Kenya for there is a dearth in these studies done in Nairobi.

2.2.2 The prevalence and severity of PTSD, depression, and anxiety disorders among paramedics

2.2.2.1 Prevalence of PTSD among Paramedics

Some researchers explain the emergence of PTSD as a result of shattered worldviews, and others whereas others explain it differently (Za, 2015). Others, including Foa and Kozack, contend that the disturbance of the fear structure causes cognitive dysfunctions, which results in PTSD (Rauch & Foa, 2006).

Paramedics experience traumatic events such as witnessing death, helping victims of abuse and violence and generally witnessing human suffering (Donnelly et. al., 2014 & Lawrence et. al., 2018).

Although encountering or witnessing a terrifying incident is a requirement in diagnosing PTSD, most of individuals who encounter a traumatic event do not acquire posttraumatic stress disorder (Skeffington et. al., 2016). Nevertheless, there is evidence supporting elevated risk of developing PTSD with exacerbated exposure to distressing events (Lawrence et. al., 2018).

Reid et. al., (2022) conducted a cross-sectional investigation on the post-exposure alterations, posttraumatic stress symptoms, and mental health of Norwegian ambulance staff. This study was done using the posttraumatic change score and posttraumatic symptom scale. This study reported that more than half of the Norwegian participants had personally or knew a colleague who had encountered aggression or dangers over the last 12 months. PTSD was found to be present in participants at a prevalence rate of 5%.

Petrie et al., (2018) examined the prevalence of PTSD and other prevalent mental disorders among ambulance employees around the world in a systematic review and meta-analysis study. The systemic review included 27 papers with a total of 30878 ambulance workers, whereas the meta-analysis included 18 studies. According to the findings, PTSD affects 11% of ambulance workers, while general psychological distress affects 27% of them.

Alaqeel et. al., (2019) cross-sectional study explored the incidence of PTSD in Emergency Medical Service personnel. The study, which was in Saudi Arabia was conducted among 110 EMTs, paramedics and ambulance drivers. The study utilized posttraumatic stress checklist for DSM 5 (PCL-5) to assess participants. The cut-off point used was at 30-35. Out of the 52 individuals assessed, 26.9% scored 30-35 and above denoting positive screen for PTSD. Additionally, EMTs had higher levels of PTSD than paramedics (32% vs 20.8%). The researchers also highlighted the prevalence rates of PTSD in South Arabia`s healthcare workers.

Iranmanesh et. al., (2013) descriptive study conducted in southeast Iran examined and compared prevalence rate of PTSD among emergency personnel and paramedics. The study utilized a sample of 150 paramedics and emergency personnel 250. Although, the two groups had different marital status, education level, gender, monthly working hours and traumatic

events experiences, the overall findings found overall prevalence rates of moderate PTSD at 94% and concluded that both groups had considerably varying levels of PTSD in all subscales.

A comprehensive analysis of PTSD prevalence in rescue workers around the world conducted using 28 studies and a population of 20414 rescue workers found a prevalence rate of 10% worldwide. They also came to the conclusion that prevalence in the Asian continent were higher than those in Europe but not higher than those in North America. The estimated prevalence of PTSD among ambulance workers was likewise higher than that among firefighters and police officers, according to this research (Berger et. al., 2012).

Bentley et. al., (2013) study assessing depression, anxiety and stress among 34,340 (24,451 EMTs and paramedics) nationally certified EMS professionals in Ohio, USA. They found out that 5.9% of EMS professionals suffered stress. They also found that the highest number of emergency service personnel had mild form of stress at 3.1%.

During the COVID-19 epidemic, a Huang et. al., (2022) meta-analysis research of first responders to medical situations looked at the prevalence rates of stress, anxiety, and depression. They found prevalence rates for stress among paramedics to be 17%, which was higher compared to other emergency service personnel (28%) and police at 22%. Additionally, they discovered that the severity levels for mild depression were 58%, moderate depression was 22%, and severe depression was 19%.

Rankin (2019) cross sectional study among paramedics in Australia assessed factors associated with PTSD, depression, anxiety, burnout. They found prevalence rates of PTSD as high as 25.4%. Rybojad et al., (2016) pilot study assessing the risk factors for PTSD among paramedics in Poland found even higher prevalence rates of PTSD at 40%.

Fjeldheim et. al., (2014) investigated exposure to trauma, PTSS, and other psychopathology in paramedic trainees in South Africa. They used life event checklist (LEC), patient health questionnaire (PHQ-15) among other tools and used a sample of 131 respondents. The findings indicated that 94% of participants had directly experienced trauma, and 16% met criteria for PTSD.

Ntatamala (2020) carried out a study in cape town South Africa among ambulance personnel. The study used a cross sectional design among 388 respondents. They sought to identify PTSD correlations and challenges encountered by ambulance workers seeking treatment for related stress. They found out that prevalence of posttraumatic stress disorder was 30%

Compared with other healthcare workers majority of studies show prevalence rates of PTSD among health care workers to be lower than those for paramedics. For instance, using a web-based study 8–12 months after the terrorist attacks, Motreff et. al., (2015) evaluating the psychological toll on first responders in terms of partial and full PTSD, as well as related aspects Researchers also discovered that among the 663 participants in the analysis, 12 months after the terrorist attacks on November 13, 2015, firefighters had a 3.4% prevalence of PTSD, medical professionals had a 4.4% prevalence, affiliated volunteers had a 4.5% prevalence, and police officers had a 9.5% prevalence. Partial PTSD prevalence ranged from 10.4% among medical workers to 23.2% among law enforcement personnel.

Other studies, which came close to establishing prevalence of PTSD in African continent was a study by Rahman et. al., (2019). This study set out to look at depression, anxiety and stress among forty-two (42) firefighters in one rescue department in Nigeria. This study used the

depression, anxiety and stress scale twenty one item questionnaire (DASS 21) tool to determine the prevalence rates of these disorders. They found out that the mean value for depression was 7.76. therefore, they concluded that 19% of the respondents suffered from elevated level of stress. Post-traumatic stress disorder (PTSD) among emergency responders at Addis Ababa Fire and Emergency Control and Prevention Service Authority, Ethiopia, was evaluated for prevalence and associated factors by Bezabh et. al., (2018), who discovered that the prevalence of PTSD was high among the respondents. Family history of mental illness, length of service, length of exposure, and kind of exposure were discovered to be the contributing factors.

2.2.2.2 Prevalence of Depression among Paramedics

Depression has been defined as experiences of either sadness or disinterest in activities one used to enjoy among other symptoms (APA, 2013).

Reid et. al., (2022) conducted a cross-sectional study to examine the psychological well-being, posttraumatic stress disorder symptoms, and post-exposure changes among Norwegian ambulance staff. This study was done among 479 ambulance personnel in Norway using the PHQ 9 assessment tool. They found out that participants had 8.6% moderate to severe depression. In support, Yip et. al., (2013) study among 2281 EMS workers reports probable depression in ambulance personnel 12 years after exposure to 9/11 attack was significantly higher for those who arrived earlier than those who arrived later. Indicating severity and probable depression rates of up to 16.7% compared with unexposed.

Bentley et. al., (2013) study assessing depression, anxiety and stress among 34,340 (24,451 EMTs and paramedics) nationally certified EMS professionals in Ohio, USA. They found out that 6.4%-7.1% were depressed. They also reported that, paramedics who worked in private

services and had more than 16 years of experience, had an increased odd of developing depression. They concluded that, compared with EMTs, paramedics were somewhat more probable to surpass DASS 21 score threshold.

According to a study by wild et. al., (2016) on pre-trauma risk factors for PTSD and depression among 386 student paramedics at the beginning of the course and two (2) year follow up, practically all the participants had faced a probably traumatic occurrence in a period of two years of studies. Although only a few paramedics suffered Major Depressive Disorder or PTSD, majority of them recuperated within in the course of few months. Nevertheless, the few of 10.6% who had an episode of major depression experienced clinically remarkable suffering and impairment with performance. During the 2 years they reported sleep disturbance, more days off work, increased weight gain, increased burn-out, lower quality of life.

In a meta-analysis study, by Huang et. al., (2022), they looked at the prevalence rates of stress, anxiety, and depression among first responders to medical emergencies during the COVID-19 pandemic. They found prevalence rates for depression among paramedics to be 37%, which was higher compared to other emergency service personnel (28%) and police at 22%. Additionally, they discovered that mild depression had severity levels of 67%, moderate depression of 24%, and severe depression of 16%. Concurrently, Rankin (2019) cross-sectional study of Australian paramedics evaluated risk factors for anxiety, sadness, burnout, and PTSD and discovered even greater prevalence rates of depression (42.9%).

Petrie et al., (2018) examined the prevalence of PTSD and other prevalent mental disorders among ambulance employees around the world in a systematic review and meta-analysis study. The systemic review included 27 papers with a total of 30878 ambulance workers, whereas the

meta-analysis included 18 studies. According to the findings, depression affects 15% of ambulance workers, while general psychological distress affects 27% of them.

Fjeldheim et. al., (2014) investigated exposure to trauma, PTSS, and other psychopathology in paramedic trainees in South Africa. They used life event checklist (LEC), patient health questionnaire (PHQ-15) among other tools and used a sample of 131 respondents. The findings revealed a prevalence rate of depression among the paramedic trainees of 28%.

The other regional studies which have come close to study of paramedics include a study by Rahman et. al., (2019) case study on depression, anxiety and stress among forty-two (42) firefighters in one Nigerian rescue center department. This study used DASS 21 tool to determine the prevalence rates of these disorders. First, they established that the mean value for depression was 7.76. Furthermore, they came to the conclusion that 18.4% of the respondents experience severe depression.

2.2.2.3 Prevalence of Anxiety disorders among Paramedics

Anxiety disorder is a mental health condition where individuals exhibit excessive and inappropriate worry, about several events or activities. These disorders lead to day-to-day impairment in performance and/or distress (APA, 2013).

Reid et. al., (2022) conducted a cross-sectional study to examine the psychological well-being, posttraumatic stress disorder symptoms, and post-exposure changes among Norwegian ambulance staff. This study was done among 479 ambulance personnel in Norway using the GAD-7 assessment tool. They found out that participants had 2.9% moderate to severe symptoms of generalized anxiety disorder.

Huang et. al., (2022) meta-analysis study looked at the prevalence of stress, anxiety, and depression among those who responded to medical emergencies during the COVID-19 pandemic. They found prevalence rates for anxiety disorders among paramedics to be 38%, which was higher compared to other emergency service personnel (28%) and 19% for police. According to this study, mild anxiety was manifested by 60% of people, moderate anxiety by 27%, and severe anxiety by 14%. In support, another study done by Rahman et al (2019) looking at the levels of depression, anxiety and stress among forty-two (42) firefighters in one rescue center department in Nigeria found out that the mean value for anxiety was 8.11. Therefore, they concluded that 31% of respondents suffered from high levels of anxiety.

The high prevalence rates of anxiety were found to be 41.3% in Rankin (2019) cross-sectional study of Australian paramedics, which also investigated variables linked with depression, burnout, and PTSD.

Petrie et al., (2018) examined the prevalence of PTSD and other prevalent mental disorders among ambulance employees around the world in a systematic review and meta-analysis study. The systemic review included 27 papers with a total of 30878 ambulance workers, whereas the meta-analysis included 18 studies. According to the findings, anxiety disorder affects 15% of ambulance workers, while general psychological distress affects 27% of them.

The above literature reviewed to determine prevalence rates and severity of PTSD, depression and anxiety disorders, among paramedics has revealed that there exist the above three mental health issues among paramedics. The literature also shows that there are elevated rates of depression and anxiety and moderate to high rates of PTSD among paramedics. However, there

is a dearth of these studies in Kenya, most studies in Kenya have been conducted among health care workers and not specifically the paramedics. This study is therefore necessary to cover the study gap.

2.2.3 Association of sociodemographic characteristics and PTSD, depression, and anxiety among paramedics

Alaqeel et. al., (2019) conducted a cross-sectional study on 110 paramedics in Saudi Arabia to identify the association between PTSD and the socio-demographic characteristics. This included their age, duration of service, position at work (Emergency Medical Technicians, paramedics, and others), military experience, social status, and marital status. The data demonstrated that those who were married had half the risk of getting PTSD compared to participants who were single. Single participants had a 40% risk of developing PTSD while married participants had a risk of 22.2%. They concluded that being married lowered the risk of developing PTSD than being single since married participants had a higher likelihood of receiving emotional support. Additionally, they found that longer duration of service did not correlate with lesser chance of getting PTSD symptoms.

Khazaei et. al., (2021) research on the prevalence of PTSD in EMTs among 259 males in Iran and assessed age, work experience, marital status, employment, EMTs degree, training history, and several shifts. They found out that, EMTs who were less than or equal to 30 years, had a work experience of less than or equal to 10 years, were married, had informal employment, those working 8 shifts or more per month, those without prior training had higher scores for PCL-5 tool. Those diagnosed with PTSD reported a mean age of 28.88 years. In comparison, those who did not have PTSD had a mean age of 33.77 years.

In conclusion, scores of PCL-5 were strongly influenced by age, marital status, and the number of shifts while no positive relationship was found between work experience, number of missions, employment status, base location, degree, and previous training and scores of PCL-5.

Another study by Iranmanesh et. al., (2013) conducted in Iran contradicts this study in the sense it reported that paramedics who worked 100-150 hours or more monthly had a lower rate of PTSD than paramedics who worked less than 100hours monthly.

Eiche et. al., (2019) nationwide cross-sectional survey among 2731 paramedics on well-being and PTSD in a Germany EMS found that female gender, older age and higher total working years were significantly correlated with lower well-being.

Rybojad et. al., (2016) pilot study assessed the risk factors for PTSD among paramedics in Poland. They found significant association between gender and PTSD and type of employment and PTSD. They found that women were more likely to report been depressed compared to males. They also reported high scores of PTSD among participants who were employed under contract. However, they could not discover any conclusive links between PTSD and either amount of schooling or age.

In order to assess the resilience and sense of coherence in PTSD in paramedics, Streb et. al., (2014) conducted a study in Switzerland using the Posttraumatic Stress Diagnostic Scale (PDS) in German. A strong, albeit weak, negative connection between age and the severity of PTSD symptoms was discovered. They found no correlation between the number of years of duty and the severity of PTSD.

Vigil et. al., (2019) analyzed Arizonas death registry for EMTs and non-EMTs. The aim of the analyses was to establish and compare rate of death caused by suicide between EMTs and non-EMTs in Arizona between. This research, which was carried on between 2009-2015 revealed that out of 350,998 deaths during the study, 7,838 were by suicide. They determined that, the prevalence rates of death by suicide were at 5.2% and 2.2% among EMTs and non-EMTs respectively.

Another web-based survey study on mental health by Stanley et. al., (2017) examined the association between PTSD symptoms and the likelihood of suicide and anxiety sensitivity as a mediating variable in USA among 254 women firefighters. The researchers compared global, physical, cognitive, and social anxiety sensitivity concerns and discovered that only cognitive and concerns about generalized anxiety sensitivity served as statistically significant mediators of the association between PTSD symptoms and suicide risk, whereas social and physical sensitivity to anxiety concerns were not.

Reid et. al., (2022) cross sectional study among ambulance personnel in Norway using the PHQ 9, GAD 7, posttraumatic change scale (PTCS) and posttraumatic symptom scale (PTSS) assessment tools found a direct correlation between anxiety as well as depression and increased PTSS score.

Bentley et. al., (2013) study assessing depression, anxiety and stress among 34,340 (24,451 EMTs and paramedics) nationally certified EMS professionals in Ohio, USA. They found out that paramedics who worked in private services and had more than 16 years of experience, had an increased odd of developing depression. They concluded that, compared with EMTs, paramedics were somewhat more probable to surpass DASS 21 score threshold.

Onyedire et. al., (2017) study on Nigerian firefighter whose aim was to assess if resilience and work locus of control could project PTSD symptomatology found that, resilience and locus of control notably envisaged PTSD. Further, the study highlighted that increased resilience had a direct association with fewer PTSD symptoms while external locus of control was associated with increased PTSD symptoms. Assessments of this study were based on Resilience Scale (RS-14), PCL-5, and Work Locus of Control Scale (WLCS).

Ntatamala (2020) carried out a study in South Africa among ambulance personnel. The study used a cross sectional design among 388 respondents. They sought to identify PTSD correlations and challenges encountered by ambulance workers seeking treatment for related stress. They found out that PTSD was associated with substance abuse. Additionally, presence of a mental health condition, medical condition, exposure to critical incident stress & chronic work-related stress were associated with PTSD risk. Participants who had emotional challenges in their daily work for the past 1month had high chances of getting PTSD.

Studies done in Australia among paramedics found a link between stress and elevated risk of developing depression and anxiety symptoms (Courtney et. al., (2010) & Courtney et. al., (2013)). Although they did not examine the sources of stress, whether operational or organizational, they concluded that stress was linked to depression and anxiety among Australian paramedics.

Additionally, Alghamdi et. al., (2016) found that the PTSD level was correlated with anxiety, depression, and passive coping. According to the study, anxiety and depression are considerably positively correlated with PTSD symptoms.

The above literature reviewed to show the association between PTSD, depression, and anxiety among paramedics has shown that paramedics can experience either of all the above mental health issues at the same time or two of the issues at the time of one of the symptoms depending on a lot of aspects. though the literature reveals that this the aspect of association of these conditions has largely been studied internationally, there are limited studies on the same in Africa and in Kenya particularly there is a dearth of studies conducted among paramedics in relation to PTSD, depression, and anxiety hence the necessity of the present study to cover this study gap.

2.3.1 Theoretical Framework: The Transactional Model of Stress and Coping by Lazarus

The historical conceptualizations of stress gave rise to this theory, which later developed as a different metatheoretical process system based on the earlier behavioral premises of stress as stimulus or reaction. This theory was pioneered by Lazarus in 1966. However, it has gone through several significant revisions to date (Lazarus 1991, Lazarus & Folkman 1984, Lazarus & Launier 1978). The work of Lazarus (2012) was influenced by concepts from early Aristotelian philosophical treatises in ancient Greece that were reinterpreted by two generations of clinical, social, and personality psychologists.

Particularly, Lazarus' (2001, 2012) early conceptions of stress, appraisal, coping, and emotions were affected by the writings of Lewin, Allport, Murray, and Tolman of the 1930s, Asch, Bruner, Harlow, Herder, Kelly, McClelland, Murphy, Rotter, Sherif, and White in the 1940s and 1950s, and the radical European traditions of the Gestaltists, Existentialists, and psychoanalysts.

Lazarus drew inspiration from individuals who opposed the radical behaviorists positivist view of psychology, and his understanding of the significance of subjectivity in emotions and stress led to a break from conventional stimulus-response theories of stress and health outcomes. However, people whom Lazarus claimed to disdain also contributed significantly to his work.

According to Lazarus & Folkman (1984), Stress is a product of interactions between a person's environment and circumstance.

This transaction results to outcomes that can lead to acute and chronic somatic and psychological distress (Hellhammer et. al., 2009). More so, stress occurs when an individual appraises the situation as important for their wellness and when the demands bypass viable coping resources (Lazarus & Folkman 1986).

This theory focused on two central tenets: appraisal or reappraisal and coping. Lazarus (1966), further distinguished between primary and secondary appraisal as evaluation of situations relevance to an individual's wellbeing and coping options respectively. The focus of primary evaluation is on whether an event occurs that is pertinent to the wellbeing of the individual. For instance, if the issue does not receive further examination if the person identifies no significance, no intersection with views, values, aspirations, or commitments, or no investment in prospective outcomes (Lazarus, 2012). While secondary appraisal focuses on coping strategies (Lazarus 1993), it happens when relationships between an individual and their environment have significance (Lazarus, 2012). The person determines the options accessible for handling the situation during secondary appraisal. According to Smith K.V., & Lazarus R.V.,(1993), secondary appraising includes future expectancy (determining whether or not the situation and its motivational congruence are likely to change), problem focused coping

potential, emotion focused coping potential, and accountability (task of assigning blame or credit for outcome).

Hence, according to Lazarus & Folkman (1984), primary and secondary appraisal lead to distinct kinds of stress characterized as threat, harm, and challenge. The term "harm" describes existing (psychological) loss or injury. While threat is the belief that danger could be just around the corner. Finally, demands that a person is convinced they can meet presents a challenge. These types of stressors are ingrained in particular kinds of emotional reaction: positive and negative emotions. For instance, anxiety reaction develops when there is confrontation with uncertainty and perception of existential threat. Lazarus (1991) also distinguished 15 fundamental emotions. Four of these are favorable (happy, pride, relief, and love), whereas the other nine are negative (anger, fright, anxiety, guilt, shame, sadness, envy, jealousy, and disgust).

The links between antecedents and consequences are mediated by appraisals (Lazarus, 2012). By evaluating the amount to which they think they can reduce loss, suffering, or challenge and take actions that directly affect outcomes, people filter potentially emotional encounters.

Lazarus talked about a different appraisal and reappraisal process to acknowledge the mobility of situation-person transactions. For instance, while reappraising, a person can discover that their coping skills and resources are adequate to reduce threat or are insufficient to handle a task. The primary appraisal variant and secondary appraisal choices might not be applicable in these circumstances (Smith & Kirby, 2011).

Two types of coping are distinguished by Lazarus and Folkman (1984). Emotion-focused coping refers to internal factors where one strives to lessen a bad emotional state or alter the

assessment of the stressful circumstance. Problem-focused coping comprises attempts to change the person-environment reality underlying unwanted feelings or stress.

According to Kay, J., & Tasman, A. (2006), prolonged stress exacerbated the risk of psychiatric conditions like depression and anxiety, which consequently increases the risk of PTSD, and psychosis. Since paramedical work involves exposure to human suffering, hazardous physical environment in an effort to save others and sometimes threat to one's life, it has been cited as a probable factor in occurrence of PTSD, depression and anxiety disorders depending on an individual's appraisal and coping mechanism.

This theory is the most appropriate for this study for it illustrates how individuals would develop psychological distress as a result of their interaction with their environment (workplace). This model will generally help in understanding how the interaction of paramedics and their working environment, their appraisal of those circumstances and the interpretation of the available resources to handle their situations can result in PTSD, depression, and anxiety.

2.4 Conceptual Framework

The goal of the study was to determine how prevalent PTSD, depression and anxiety disorders amongst paramedics in Nairobi County was. The researcher sought to find the association between the variables and their influence on the independent and dependent variables.

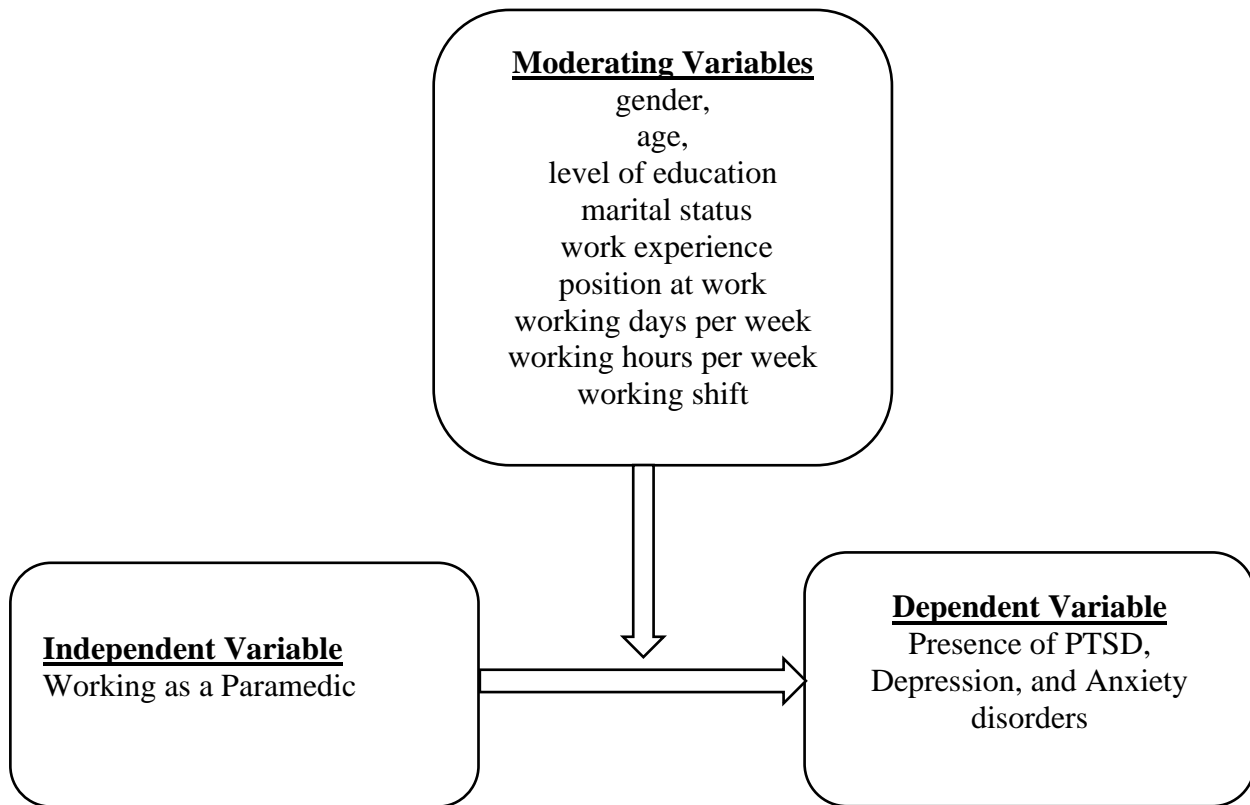
The independent variable was taken to be working as a paramedic. This is due to the fact that, as literature has shown, working as a paramedic involves exposure to traumatic events which include death, pain, human suffering and at times threat to paramedics own lives in cases where

they are handling a psychiatric patient. Hence, this exposure determines or influences occurrence of PTSD, depression and anxiety disorders amongst paramedics.

The dependent variables will be presence of PTSD, depression and anxiety disorder amongst the paramedics. This is due to the fact that, PTSD, depression and anxiety disorders have been shown in the literature to be possible outcomes of repeated exposure to traumatic events as experienced by first responders, paramedics included (APA, 2013). Hence, these three disorders were taken to be the independent variables.

The moderating variables will be gender, age, marital status, education level, position at work, work experience, working days and hours per week and working shift. This socio demographic variables were taken as the moderating variables due to the fact that, they have the possibility to affect the strength or direction of the association between the dependent variable and the independent variable or they could change the outcome that a predictor variable has on the outcome variable. These variables can also be manufactured artificially by changing the circumstances (for example, by manipulating the settings to create a negative or positive service quality), or they can be naturally occurring, measured, or determined variables (such as age, gender, and industry type).

Figure 1 Conceptual Framework



2.5: Significance and justification of the Study

Paramedics among other first response teams are normally the first on the scene to face draining, dangerous, challenging situations, help survivors of disaster and offer physical and emotional aid to them. Although these duties are necessary to the community, they are difficult and as time they put paramedics at an elevated risk of trauma.

As per DSM-5 (2013), repeated exposure to distressing details of a disturbing event as is the case with first responders: paramedics can lead to the development of PTSD. Further, DSM-5 (2013), outlines a high rate of PTSD (80%) comorbidity with depressive and anxiety disorders. Additionally, cases, where some prehospital care procedures are administered and pose potential harm to patients, may affect the mental well-being of the paramedics.

Therefore, undertaking a study of the prevalence of Post-Traumatic Stress Disorder (PTSD), depression, and anxiety disorders among paramedics in Nairobi County is important for a variety of reasons, given the unique challenges and stressors that paramedics face in their line of work, especially in a not so developed environment like Kenya. First, paramedics frequently encounter traumatic and distressing situations, which can increase their risk of developing mental health conditions like PTSD, depression, and anxiety. Understanding the prevalence of these disorders can shed light on the mental health challenges within the profession. Second, Paramedics' mental health directly affects their ability to provide effective and compassionate patient care. High levels of distress can potentially influence how paramedics interact with patients, families, and colleagues. Lastly, Untreated mental health conditions like PTSD, depression, and anxiety can impair decision-making, concentration, and overall job performance. This can compromise patient care and paramedic safety.

The findings of this study will be beneficial to paramedics because it will enlighten them on what they go through in their line of duty, it will be an eye-opener for them to become more aware of the psychological issues they acquire in their line of duty hence they will be able to seek help when necessary. The findings will also be beneficial to administrators and policymakers dealing with paramedics for they will raise awareness through offering information on how their employees are affected by their work and hence it can inform the development of policies that support paramedics' mental health. This might include guidelines for post-traumatic debriefing, mental health resources, and organizational changes to reduce stressors. This work also contributes a lot to research knowledge and will also reveal research gaps that future researchers can investigate. Research on the prevalence of these disorders can lead to the development of screening tools that help identify paramedics who may be struggling

with mental health issues. Early identification can allow for timely intervention, reducing the potential for these conditions to worsen. More so, accurate data on the prevalence of PTSD, depression, and anxiety among paramedics can inform the design of targeted treatment and support programs. This might include specialized therapy, counseling, and peer support groups tailored to their unique experiences. Research findings can contribute to advocacy efforts aimed at improving mental health services, training, and support for paramedics. It can also raise awareness among stakeholders about the challenges paramedics face. A study on the prevalence of mental health disorders can help identify factors contributing to paramedics' stress and distress. Addressing these factors can contribute to increased job satisfaction, reduced burnout, and higher retention rates within the paramedic workforce. Last but not the least, publicizing the results of such a study will help reduce the stigma surrounding mental health within the paramedic profession. This can encourage paramedics to seek help without fear of judgment, leading to better mental health outcomes.

2.6: Research Question

1. What is the Prevalence of PTSD, Depression and Anxiety Disorders among Paramedics in Nairobi County?

2.7 Main Objective

1. To determine the prevalence of PTSD, Depression and Anxiety Disorders among Paramedics in Nairobi County

2.8. Specific Objectives

1. To determine the risk and protective sociodemographic characteristics of paramedics in Nairobi County

2. To ascertain the levels and severity of PTSD, Depression and Anxiety Disorders among Paramedics in Nairobi County
3. To determine the association between sociodemographic characteristics, PTSD, Depression and Anxiety Disorders among Paramedics in Nairobi County

2.9. Research Questions

1. What are the Risk and Protective Sociodemographic Characteristics of Paramedics in Nairobi County
2. What are the Levels and Severity of PTSD, Depression and Anxiety Disorders among Paramedics in Nairobi County
3. Is There an Association between Sociodemographic Characteristics, PTSD, Depression and Anxiety Disorders among Paramedics in Nairobi County

2.9. Assumptions of the study

The following are the study's underlying presumptions:

1. That the respondents do not understand the concepts of PTSD, depression, and anxiety.
2. That the respondents will share their real experiences with PTSD, anxiety, and depression.

CHAPTER THREE: RESEARCH METHODS

3.1 Introduction

This chapter describes the methods and procedures of the study

3.2 Study design

This research study employed quantitative and descriptive cross-sectional study design. This design is a kind of an observation study such that variables under study are observed in their normal environment without any kind of manipulation. The design is useful in determining prevalence of a specific occurrence whether it is presumed to exist as a cause and/or as the outcome in the stipulated population (Zangirolami-Raimundo et. al., 2018). It is also faster, inexpensive and helpful in public health planning, evaluation monitoring. However, it does not offer casual relationships since it is a one-time measure of exposure and outcome. It is also susceptible to some biases when interpreting the association of variables under study (Setia M.S. 2016).

3.3 Study site

This study was carried out in Nairobi City County. Nairobi City County is the host to the capital city of Kenya, Nairobi City, which is also the administrative center for the Kenya National Government.

According to the Kenya National Bureau of Statistics and the projections of the Kenya Population and Housing Census (2019), the population of Nairobi City and Nairobi City County is as follows:

Nairobi City (Central Business District): The population of the central business district of Nairobi, which is the core urban area, was estimated to be around 4 million people. This figure includes residents, commuters, and people working in the city.

The city is divided into several administrative regions. These regions are further divided into neighborhoods and sub-locations. The major administrative regions of Nairobi City are:

Nairobi Central Region: This is the central business district of Nairobi and is home to many government buildings, financial institutions, and commercial areas; Westlands Region: Known for its upscale neighborhoods, Westlands is a hub for shopping, entertainment, and dining; Eastlands Region: This region is located to the east of the central business district and includes areas such as Buru Buru, Umoja, and Donholm; Dagoretti Region: This region is located to the west of the city center and includes areas like Karen and Kawangware; Kasarani Region: Located to the north of the central area, this region includes the Kasarani sports complex and residential neighborhoods; Embakasi Region: Situated to the southeast of the city center, this region includes the Jomo Kenyatta International Airport and various residential areas; Lang'ata Region: This region is located to the southwest and includes the Nairobi National Park, as well as neighborhoods like South C and South B; Starehe Region: This region includes neighborhoods like Pangani and Majengo and is located north of the central business district; Roysambu Region: Positioned to the northwest of the city center, this region includes residential neighborhoods and commercial areas; Kibera Region: Kibera is one of the largest slums in Africa and is located to the southwest of the city center.

These regions represent the general administrative divisions within Nairobi City

Nairobi City County: The population of Nairobi City County, which includes the central business district as well as its surrounding areas and suburbs, was estimated to be around 4.4 million people, occupying an area of 696.1 km². This is intense growth compared to 350,000 people who lived in Nairobi at independence in 1963. Each sub-county is further divided into wards, which are the smallest administrative units in Nairobi City County. Wards of the county

and regions of the city play a significant role in local governance, representation and delivery of services.

Therefore because of its organization structure, resources and infrastructure, Nairobi City County was the most equipped to handle medical emergencies and provide support for paramedics. As a result, it was chosen as the most suitable location for conducting research on the prevalence of PTSD, depression, and anxiety disorders among paramedics.

Additionally, with its available resources, the capital city can potentially provide access to a larger population of paramedics, allowing for a more comprehensive study sample. Also, the city's healthcare facilities and services may offer valuable information and data on the mental health status of paramedics, given their proximity to and involvement in emergency medical care.

There are private, public and non-governmental organizations paramedic groups in Nairobi County. Hence, conducting research on the prevalence of these psychiatric conditions among paramedics in the capital city will add to the knowledge and better comprehension of the challenges they face and the support needed to ensure their well-being. The rich information available in the city can help inform policies, interventions, and resources aimed at addressing mental health concerns among paramedics and improving their overall mental well-being.

3.4 Study population

The study targeted organization-based Paramedics in Nairobi County. The data was collected from 39 paramedics who were aged 18 and above working at AMREF, AAR, and St. John's Ambulance.

Even though Nairobi County has many Emergency Medical Services organizations, AMREF, AAR, and St. John's Ambulance were the only organizations that provide first aid and emergency medical services in Nairobi County that were willing to cooperate in the research work.

Inclusive criteria

The participants in this study were included on the following basis

- i. Respondents who were paramedics, emergency medical technician, and ambulance drivers
- ii. Respondents who gave consent in writing
- iii. Respondents who were 18 years and above

Exclusive criteria

The participants were excluded from the study on the following basis;

- i. Paramedics and EMT interns/ students, call takers,
- ii. Respondents who decline to give consent.
- iii. Paramedics who work for other organizations

3.5 Sample size calculation

The sample size was based on Kathuri & Pals (1993) formula of determining sample sizes.

$$n = \frac{Z_{1-\alpha/2}^2 + NP(1 - P)}{\sigma^2(N - 1) + Z_{1-\alpha/2}^2 P(1 - P)}$$

$$n = \frac{X^2 NP (1-P)}{\sigma^2 (N - 1) + X^2 P (1 - P)}$$

$$\sigma^2 (N - 1) + X^2 P (1 - P)$$

Where:

n = required sample size

N = the given population size from the sampling frame, in this case, is 43

P = Prevalence assumed to be 0.50

δ = the degree of accuracy whose value is 0.05

α = alpha at 95%

$$Z_{1-\alpha/2} = 1.96$$

Therefore, $n = \frac{3.841 \times 43 \times 0.5(1-0.5)}{0.05^2(43-1) + 3.841 \times 0.5(1-0.5)}$

$$0.05^2(43-1) + 3.841 \times 0.5(1-0.5)$$

$$n = 39$$

Based on the above formula, 39 paramedics will be sampled to participate in the study.

Table 3.5. 1 Sampling Frame

Institution	Population	Proportion %	Sample Size
St. John Ambulance	18	42%	16
AAR	19	44%	17
AMREF	10	24%	6
Total	43	100%	39

The study participants were allocated proportionate to size of the targeted institutions. The following formula was used for allocation

$$n_0 = \frac{n_p}{N} * n$$

Where:

n_0 = required sample size per institution (number of paramedics)

n_p = Population of the institution

N = Total population size of the targeted institutions

n = Study sample size

3.6 Sampling procedure

The research used convenience sampling procedure to select paramedics who met the inclusion criteria from each institution. This method was selected because it requires little planning, uses participants who are available at the moment and it is time efficient, simple, easy to reach participants and collect information, cost effective and convenient. This method of sampling is used when other types of sampling methods are difficult to utilize due to time constraints, high costs and other factors. However, it is not possible to specify the probability of any population elements being selected for the sample, therefore, the study is limited in generalization of the results to the entire population under study. It can also have biases and limitations related to reliability of study results (Lammers & Badia, 2004). Hence the researcher conveniently selected paramedics from all emergency departments in each of the institutions because emergency service work is characterized by frequent work shift and randomizing the sampling procedure would have been challenging. Out of the total sample of 39 paramedics from the three institutions who were utilized in this study, 16 were from St. John's ambulance, 6 were from AMREF, and 17 were from AAR.

3.7 Recruitment, acquisition of consent and procedure of data collection

The researcher obtained permission from the different institutions under study. The participants were interviewed within the premises of each institutions emergency department (AMREF, St. Johns Ambulance and AAR) and were sampled during working days and hours. Participants who were available were approached and screened if they meet the inclusive criteria. Those who meet the inclusive criteria were briefed on the aim of the study by the researcher while those who did not meet the inclusive criteria were appreciated and excused. The researcher issued the consent forms and offered explanation of its content. Those who did not sign the consent form were excused while those who signed the consent form were given the

questionnaire that consist of a section on socio demographic information, PCL-5, PHQ-9 and BAI. Self-administration of study tools by participants was done with supervision by the researcher. The participants were given at least 20 minutes to respond to the questions. However, the time was not fixed to 20 minutes only. The researcher remained available for clarification and guidance when needed.

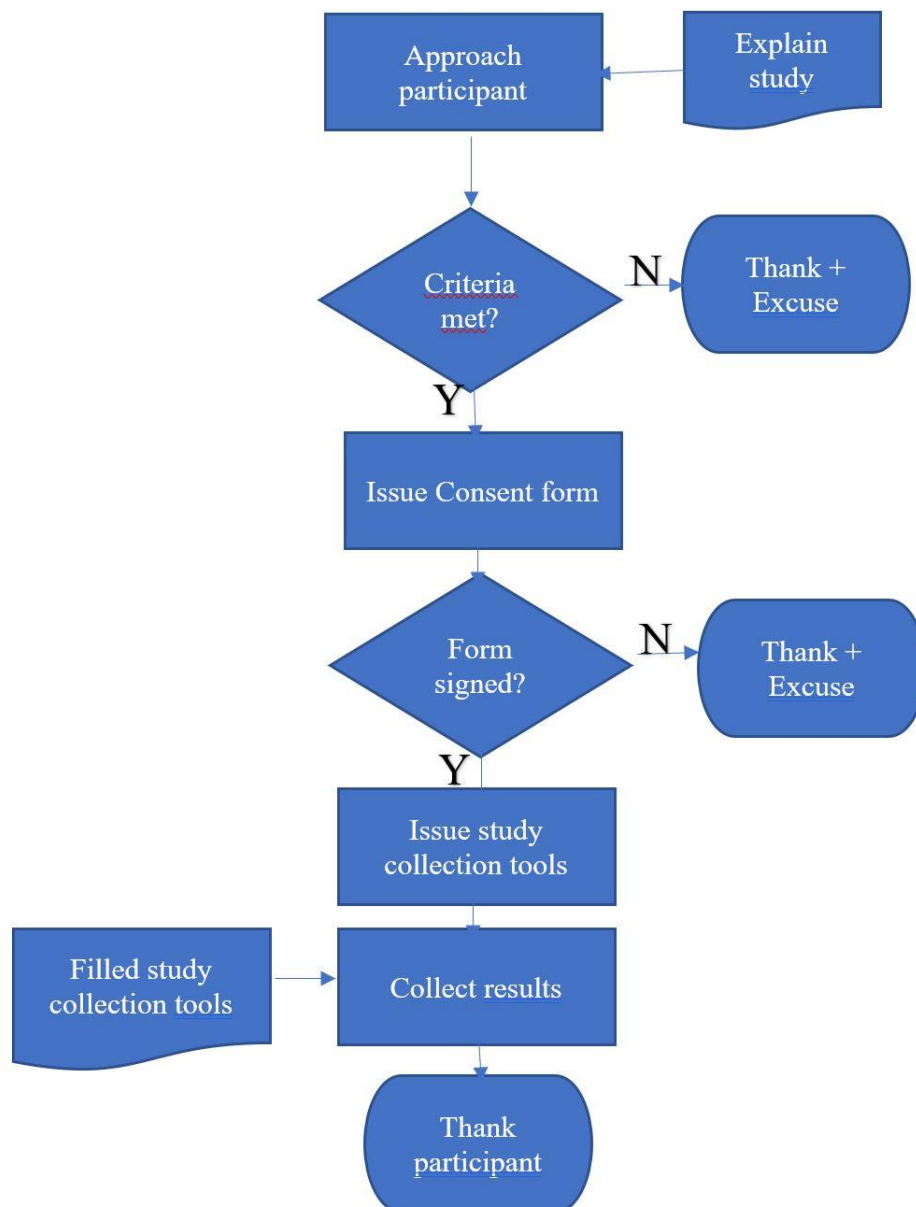


Figure 2: Recruitment and Data Collection Flowchart

3.8 Variables

The independent variable, also referred to as the predictor or explanatory variable, is a factor that partially or completely influences a specific outcome. Or rather, it is a variable that is changed during an experiment. In other words, the experimenter decides whether to expose participants to the independent variable or not. On the other hand, **the dependent variable**, also known as the outcome variable, is the factor that is wholly or partially influenced by the independent variable (Swaen et. al., 2017). In other words, the dependent variable is assessed to see if the independent variable's manipulation had any significant impact. In this study, the independent variable was the occupation of working as a paramedic, as it has the potential to predispose paramedics to develop of PTSD, depression, or anxiety disorders. The dependent variables, on the other hand, were the resulting PTSD, depression, or anxiety disorders, which emerged as outcomes associated with the experience of working as a paramedic.

The degree and/or direction of the link between the dependent or criterion variable and the independent or predictor variables can be affected by a **moderating variable**, which can be qualitative or quantitative (for instance, sex, religion, or customer satisfaction) (Baron et. al., 1986). Age, gender, and industry type are examples of naturally existing, measurable, or determined variables. However, it can also be artificially manufactured by manipulating the conditions (that is, negative/positive service quality) (RO, 2012). A third variable known as a moderating variable may modify the direction of the dependent and independent variables, the strength of the correlation, or both in correlational studies. Also, it could be said to be variables that change the outcome that a predictor variable has on the outcome variable. It is also not affected by the predictor variable but it affects the outcome variable (Swaen, B. & George, T. 2022). Therefore, in this study, the moderating variables were age, marital status, gender, education level, position at work, work experience, working days and hours per week and

working shift. This is because, these factors could alter the effect working as a paramedic contributes to development of PTSD, depression and anxiety disorders in paramedics.

3.9 Data collection tools

The researcher utilized questionnaire to gather information. The questionnaire had four parts. Part one was designed by the researcher to collect data on the Socio-demographic information of the participants. Part two had items from Post-Traumatic Stress Disorder Checklist (PCL-5) used to screen for PTSD. Part three had items from Patient Health Questionnaire nine item (PHQ 9) which screened for depression, and part four had items from Becks Anxiety Inventory used to assess anxiety symptoms.

3.9.1 Socio-demographic Questionnaire

A socio-demographic questionnaire was used to provide a foundational understanding of the characteristics and diversity of research participants. This information was intended to help in making informed analyses, comparisons, and decisions based on the specific context and goals of our study. For this study the focus was on the following:

Participant Profiling: Socio-demographic questionnaires helped to create a profile of the study participants. This includes information such as age, education level, gender, duration of service, marital status, working days per week, working hours per day, work shift and position at work. This profiling assisted in understanding the makeup of the sample. **Sample Representation:** Collecting socio-demographic data ensures that the sample is representative of the larger population under investigation. This is important for generalizing research findings to broader groups. **Group Comparisons:** To compare different groups based on socio-demographic characteristics. For example, analyzing how responses to questions vary between age groups or between genders. **Contextual Understanding:** The collection of this data provide

context for interpreting research findings. Different demographic groups may have distinct experiences, behaviors, or attitudes that influence how they respond to research questions. Covariate Control: There was a need to understand how socio-demographic variables can be used as covariates to control for their potential influence on the relationship between the variables being studied. This was to enhance the validity of the research results.

3.9.2 Patient Health Questionnaire (PHQ-9)

The PHQ-9 tool contains 9 items. It is a component of the larger Patient Health Questionnaire screening tool and is usually self-administered (Kroenke et al., 2001). This tool is reliable and valid for screening of Major Depressive Disorder (Kroenke et al., 2001). The tool questions focus on enquiring from the individual on possible depressive symptoms. The symptoms must have been present within two weeks before administering. The 9 items have a score of 0-3 suggesting whether one has been disturbed by the symptoms in the past two weeks or not. 0 suggests the candidates have not been disturbed by the symptoms at all, 1 suggests the candidates have been disturbed for several days, 2 suggests the candidate has been disturbed for more than half the days, and 3 suggests the candidate has been disturbed for nearly every day. The tool features cut-off points of 5, 10, 15, and 20 for mild, moderate, and severe symptoms, with a severity score range of 0-27. A cutoff of 10 or greater than 10 indicates a positive screening for MDD. Higher the scores, the greater the intensity of anxiety symptoms. A lower score indicates fewer symptoms (Kroenke et al., 2001). PHQ 9 tool has a good internal reliability with a Cronbach's α of 0.89. It also has a good concurrent validity with the Beck's depressive inventory (BDI) ($r=0.67$, $P < 0.001$). It is also reliable and valid when assessing major depressive disorder symptoms

3.9.3 PTSD checklist civilian version (PCL-5 Short-Form)

Price et. al., (2016) developed this 20item tool to screen for posttraumatic stress disorder (PTSD). It is based on the PTSD diagnostic criteria on Diagnostic and Statistical Manual of Mental Disorders, fifth edition (DSM 5). Thus, it is referred to as PCL-5. It`s a valid, reliable and widely used screening tool for posttraumatic stress disorder. The questions are centered on assessing symptoms one month after the traumatic event. This tool can be used over time to monitor PTSD symptom changes. It can be used as both screening and diagnostic tool in clinical setting. Every item has a score of 0 to 4, suggesting whether the respondent has been disturbed by that symptom or not and to what level. In this case, the scale of 0,1, 2, 3 and 4 indicates, not at all, little bit, moderately, quite a bit and extremely disturbed respectively in the past month with a cutoff of 31-33 being indicative of PTSD. The severity score ranges from 0-80. Higher the scores, the greater the intensity of anxiety symptoms. A lower score indicates fewer symptoms (Blevins et. al., (2015) & Zuromski et. al., (2019)).

The tool has been proven to have a good internal reliability with a Cronbach`s alpha of .97. (Weathers et. al., 1993). This tool is valid when it comes to screening for stress and trauma among paramedics (Donnelly et. al., 2016).

3.9.4 Beck Anxiety Inventory

Dr. Aaron Beck and colleagues created the Becks Anxiety Inventory in 1988. The tool is a widely used self-report questionnaire. It was developed to assess the intensity of an individual's anxiety disorder symptoms. It has 21 components. These questions assess both the cognitive and bodily aspects of anxiety. The BAI is typically administered and completed by the individual themselves.

Each item on the BAI is rated on a scale of 0 to 3. The BAI's overall score can vary from 0 to 63. Higher the scores, the greater the intensity of anxiety symptoms. A lower score indicates fewer symptoms. The scores on the Becks anxiety inventory are typically categorized into three ranges. A score of 0 to 21 denotes little anxiety, 22 to 35 denotes moderate anxiety, and a score of 36 or more denotes potentially concerning levels of worry. In clinical settings, a cut score of 22 is often used as a threshold for identifying individuals with moderate to severe anxiety symptoms.

This tool is amongst the frequently used tools to evaluate and screen for anxiety in individuals. It has been proven to have a good internal reliability (Cronbach's alpha .94) and discriminant validity (Cronbach's alpha .89) (Bardhoshi et. al., 2016; Beck, A. T., & Steer, R. A. (1993); Fydrich et. al., 1992).

3.10. Quality Assurance Procedures

The process of data collection involved gathering information from eligible participants who were approached and provided with a clear understanding study objectives and importance. Participants were given the freedom to decide whether or not to voluntarily participate in the study. Importantly, individuals who chose not to take part were not subjected to any negative consequences or victimization.

The eligibility of potential study participants was evaluated, and those who met the inclusion criteria received a comprehensive clarification about the study. Any questions they had were thoroughly addressed before obtaining their informed consent. The data collection process commenced only after confirming their informed consent through signature on the consent form. In order to maintain anonymity, the study tools did not include participants' names;

instead, a distinctive identifier known by researcher only was used. The data was collected in English, with the researcher providing assistance if needed.

The researcher provided pens which were used by the participants the study questionnaires. Upon completion of the questionnaires, a thorough check was conducted to ensure their completeness. Subsequently, those who participated in the study were thanked for their participation in the study. To ensure data integrity and potential follow-up in the future, the researcher meticulously reviewed all completed questionnaires in the field, paying close attention to the data's completeness, including the unique identifier if necessary.

3.11 Ethical consideration

3.11.1. Ethical Approval

The research project underwent a full presentation at the University of Nairobi's Department of Psychiatry in order to obtain approval before being submitted to the KNH/UON Ethics Board for ethical clearance. An introductory letter was obtained to aid the researcher in order to gain access to institutions under study. A research permit was obtained from NACOSTI (the National Commission for Science, Technology, and Innovation) before the study's commencement. Additionally, after obtaining the NACOSTI letter, authorization letters from education director, the county commissioner, and the governor's office were also obtained. Prior to conducting the study in the emergency departments of AMREF, AAR, and St. John's Ambulance, consent was sought from each institution to conduct the research within their respective facilities.

3.11.2. Obtaining Informed Consent

Prior to data collection, all potential participants underwent an assessment to determine their eligibility based on the inclusion criteria. Informed consent was then obtained from those who met the criteria before commencing the data collection process. The study's details were presented to the participants in a clear and easily comprehensible manner. Following the explanation, the participants expressed their satisfaction with the study's information by signing the consent form. The researcher also signed the consent form, affirming that a sufficient explanation had been provided. To address potential language barriers, the consent form and all explanations were conducted in English.

3.11.3. Potential Benefits of the Study

Regarding the benefits of the study, the participants may not have direct benefits. However, the study findings will be beneficial to paramedics because it will enlighten them on what they go through in their line of duty, it will be an eye-opener for them to become more aware of the psychological issues they acquire in their line of duty and therefore they will be able to seek help when necessary. The findings will also be beneficial to administrators and policymakers in the organizations while dealing with paramedics for they will offer information on how their employees are affected by their work and hence can help in coming up with psychosocial support structures. This work also contributes a lot to research knowledge and will also reveal research gaps that future researchers can investigate.

More so, Studying the prevalence and association between sociodemographic characteristics and PTSD, depression, and anxiety among paramedics is crucial for developing comprehensive strategies to support their mental health. This knowledge can lead to more effective

interventions, improved workplace policies, and better overall well-being for paramedics across diverse backgrounds.

The studying can also highlight any disparities in mental health outcomes among paramedics from different sociodemographic backgrounds. Efforts can then be directed towards addressing these disparities and ensuring equal access to mental health support. Understanding which groups of paramedics are at a higher risk can guide the allocation of resources for mental health support.

Findings from this study can influence the development of workplace policies that address the specific needs of different sociodemographic groups. For example, flexible work arrangements or peer support programs might be particularly beneficial for certain groups.

3.11.4. Potential Risks of the Study

Studying the prevalence of PTSD, depression, and anxiety amongst paramedics in Nairobi County is an important endeavor, but it also comes with potential risks and ethical considerations. However, given that no sample collection was necessary for this study, there was no expectation of causing any physical harm. Here are some of the potential risks that the researcher needed to be aware of:

First, there is psychological impact on participants. Asking paramedics about their mental health could potentially trigger or exacerbate symptoms of PTSD, depression, or anxiety. Revisiting traumatic experiences could be distressing for some participants. Therefore, it is important to acknowledge that discussing sensitive topics related to the challenges experienced in emergency care may potentially make some participants uncomfortable or trigger emotional distress. In such cases, to minimize the risks, participants were interviewed in their respective

organizations where they were comfortable. This was only after their informed consent was obtained, ensuring participants understood the purpose and benefits of the study. They were further briefed on the potential risks of the study and how it could be mitigated. Then, the researcher closely monitored the administration of questionnaires such that early signs of re-traumatization were identified. More so, the researcher provided a safe environment where participants who showed signs of distress were allowed to quit the study without victimization. More so, the researcher provided an assessment and offered psychological first aid to address any psychological distress observed among the participants. Depending on the severity of the distress, appropriate referrals to qualified mental health professionals were made to ensure that adequate interventions were provided.

Secondly, there is stigmatization and privacy concerns. In general, participants might fear being stigmatized by their colleagues or superiors if they disclose mental health struggles. The stigma associated with mental health issues could discourage some paramedics from participating or being honest about their experiences. Therefore, it was very important that the researcher guaranteed participant confidentiality and anonymized the data during analysis. This is because the sensitive nature of mental health information requires careful protection of participants' privacy. In a tight-knit community like paramedics, maintaining confidentiality is a big challenge.

Third, participant withdrawal. The emotional toll of discussing mental health issues might prompt some participants to withdraw from the study or avoid seeking help if they perceive it as too emotionally demanding. No such withdrawals occurred.

Fourth, reporting and duty issues. If the study identified a significant prevalence of mental health issues, there could have been legal and ethical obligations to report cases where

paramedics might not be fit for duty due to their mental health. However, this did not happen in this study.

Lastly, generalization and bias. Findings from one specific geographic location (Nairobi County) might not be generalizable to paramedics in other regions due to variations in culture, work environment, and resources.

In conclusion, ethical oversight, careful planning, and a genuine concern for the well-being of participants are critical in conducting research on sensitive topics like mental health among paramedics.

3.11.5. Confidentiality

The researcher gave the participants assurances of anonymity by assuring them that no personal information about them would be included in the data gathered and that the study was only conducted for research and academic purposes. All surveys were coded in order to prevent the study participants from having to expose their identities, which helped to ensure this. Only the researcher had access to their data. All questionnaires were safely stored by the researcher in a lockable cabinet, and all data were saved on a computer that the researcher alone had access to using a password.

3.11.6. Voluntary Participation

The study's participants were made aware that taking part in it was entirely up to them. All justifications for the study were provided. The study participants were also made aware that they could decline to take part and leave at any time without fear of negative consequences.

3.11.7. Monetary Benefit

This study has not been used for monetary gain and neither did it yield any financial rewards or monetary benefits to anyone whatsoever.

3.11.8. Study Results Dissemination

The results of the study were given to the Department of Psychiatry, School of Medicine (UoN), following the conclusion of data processing. The final dissertation was submitted following the dissertation defense in order to fulfil the criteria for the Master of Science in Clinical Psychology degree. The study results were also communicated to the appropriate authorities, such as the Department of Psychiatry at the University of Nairobi, AMREF, St. Johns Ambulance, and AAR, in order to contribute to the body of knowledge and to assist policymakers in developing regulations that address the difficulties faced by paramedics in the course of their daily work.

For future reference, the study was made available at UON school library and Kenyatta National Hospital Medical Research Department.

Along with publication in a peer-reviewed journal, the findings will also be published with approval from the KNH-UON ethics board.

3.12. Study limitations and Measures to Address Them

This study targeted a vulnerable group of individuals who witness human suffering in their line of duty. Even though some organizations have developed psychosocial support for their

employees, some questions could have brought back uncomfortable and distressing memories, thoughts and feelings that could lead to re-traumatization and if not managed could further impair them. In order to minimize the risk, the research created a safe environment where participants who showed signs of distress could be allowed to quit the study, get psychological first aid from the researcher and referral for further psychosocial support if need be in their respective institutions psychosocial support department and Kenyatta National Hospital mental health department. Follow up was also done to ensure the participants affected are getting psychological support.

This study, which looked at the prevalence of PTSD, depression, and anxiety disorders among paramedics, concentrated on the particular group of institutions that were willing to participate because other EMS providers declined to take part in the survey. As a result, the conclusions cannot be applied to Nairobi's full paramedic workforce. To acquire more thorough and representative results that may be applied to a larger population of paramedics, it might be required to duplicate this study utilizing various research techniques and larger sample sizes. The study was a descriptive cross-sectional study, making it challenging to infer casual correlations because exposure and result were measured only once. When interpreting the relationship between the variables under research, it was subject to certain biases. Future studies might integrate different study designs.

The study relied on information recalled by the study participants, some could have give inaccurate information either due to forgetting or fear of being judged. The study participants were encouraged to be honest, confidentiality was guaranteed and the data collection was done in a secure room to encourage confidentiality in case of fear by the study participants of

disclosing any information they deem to be embarrassing. The researcher sought clarification on any issue that was not clear at the time of data collection.

Finally, this study used self-report questionnaires and reviewed literature contained studies which used different study tools to measure PTSD, depression and anxiety disorders rather than diagnostic assessment which could raise issues related to instrument variability and reliability of prevalence outcomes.

3.13. Data analysis

Then questionnaire was presented to participants as hard copies. The raw data was converted into an excel spreadsheet and then put into the SPSS version 26 programme. Using IBM SPSS version 26 software, data was cleaned and examined. The categorical variables' frequencies and percentages were used to present participant characteristics. Bivariate analysis was conducted using fishers exact test for categorical comparisons and nonparametric tests for continuous variables to identify any associations between the disorders and participants' characteristics.

Prevalence of the mental health disorders were classified in a binary category based on literature-defined cut-offs of ≥ 10 for depression, ≥ 31 for PTSD and ≥ 22 for anxiety. The prevalence of PTSD, depression and anxiety was presented in graphical and tabular formats. Statistical significance was taken at $p < 0.05$.

CHAPTER FOUR: RESULTS

4.1 Introduction

The current research set out to investigate the prevalence and severity of PTSD, depression and anxiety disorders among paramedics in Nairobi County. The focus of the study was to find out whether there was any significant association between socio demographic characteristics and disorders under study. To answer the research questions and meet the objectives of the study, structured questionnaires were employed to generate data from participants.

Participants were conveniently recruited from three emergency service personnel institutions in Nairobi County. This research was done at St. Johns Ambulance, AAR and AMREF institutions in Nairobi County. A total of thirty-nine (39) participants were approached and all agreed to participate in the study. Each participant was issued with a hard copy structured questionnaire, which was filled and analysed representing 100% response rate. On completion, the raw data was transformed into an excel spreadsheet after which it was uploaded into SPSS version 26 software. The data was cleaned and analyzed using SPSS version 26 software.

4.2 Participant Characteristics

The study interviewed 39 participants. 59% (23) were males and 41% (16) were females. Majority of the participants were aged 28 to 37 years 46% (18), followed by 18 to 27 23.1% (9) and over 38years. Close to a half of the participants were single 49% (18) and married 46% (17). Majority of the study participants had a college certificate 38% (15), followed by those with degree at 25.6% (10) and diploma at 23.1% (9). Only 2 participants had a post graduate diploma. Majority of participants worked as paramedic 41% (16), EMT were 36% (14), had 2-

5 years of service 39% (15) followed by those who had worked less than 1 year 21.1% (8). Majority of participants worked 4-5 days per week 34 87% (34), worked above hours 76% (29) and worked either day or night 90% (35). More of the results are as shown in **table 4.2**.

Characteristic	Category	n	%
Gender	Male	23	59.0
	Female	16	41.0
Age	18-27 years	9	23.1
	28-37 years	18	46.2
	38-47 years	6	15.4
	48-57 years	6	15.4
Level of education	Secondary	3	7.7
	College Certificate	15	38.5
	Diploma	9	23.1
	Degree	10	25.6
Marital status	Post-graduate diploma	2	5.1
	Single	18	48.6
	Married	17	45.9
	Separated/Divorced	2	5.4
Position at work	Trained paramedic drivers	9	23.1
	EMT	14	35.9
	Paramedics	16	41.0
Years of service	0-1 years	8	21.1
	2-5 years	15	39.5
	6-10 years	6	15.8
	>10 years	9	23.7
Working days per week	2-3 days	3	7.7
	4-5 days	34	87.2
	6-7 days	2	5.1
Working hours per day	Below 8 hours	2	5.3
	8 hours	7	18.4
	Above 8 hours	29	76.3
Working shift	Day only	3	7.7
	Day or night	35	89.7
	Night only	1	2.6

Table 4.2 1 Sociodemographic Characteristics

4.3 The Levels and Severity of PTSD, Depression and Anxiety Disorders

4.3.1 Overall prevalence of depression, PTSD and anxiety disorders

This study's main objective was to find out how common PTSD, depression, and anxiety disorders were among paramedics in Nairobi County. All illustrations can be found in **figure 4.3.1**

4.3.1

The most common mental health problem, though not in its severe form, in this group was depression manifesting in approximately 17.9 % of the population followed by PTSD at 12.8% while anxiety was the least common only reported in 5.1% of the population.

However, overall, 26% of the population reported at least one mental health problem. Only 5.1% had two of the mental health disorder while none of the participants had all the three mental health problems. This is as shown in **figure 4.3.1**

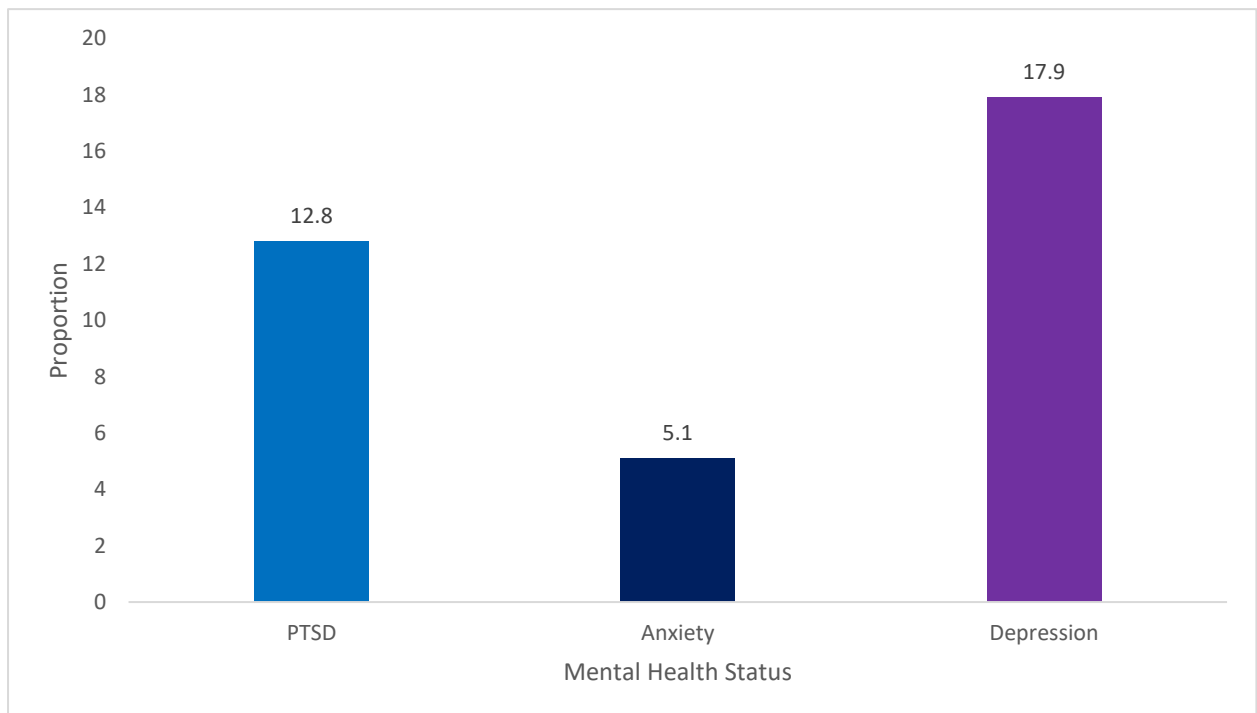


Figure 4.3. 1 prevalence rates of depression, PTSD and anxiety disorders

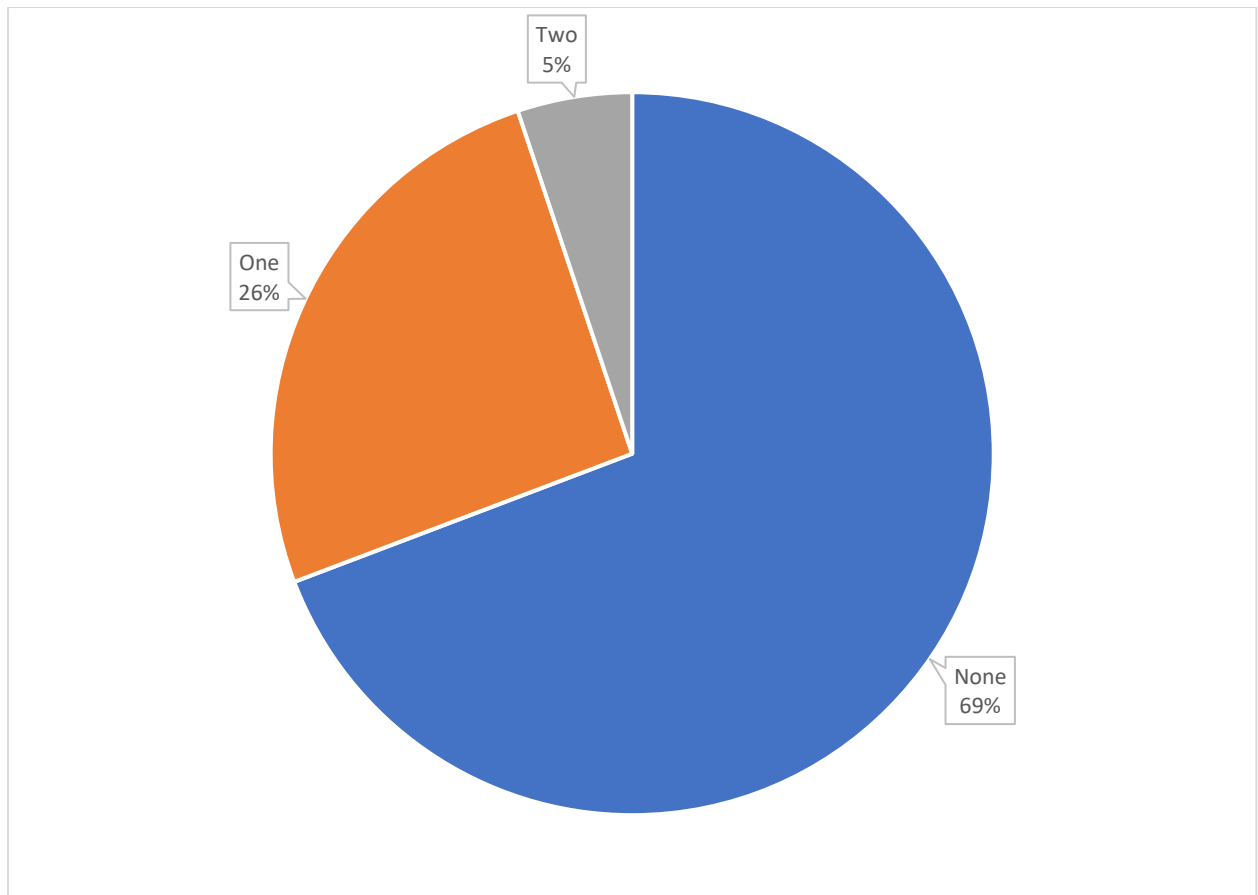


Figure 4.3. 2 Number of mental health problems

4.3.2: Severity level of depression, PTSD and anxiety disorders

Out of the 39 participants, 23 participants (59%) showed mild to severe depression, PTSD, and anxiety disorders.

The severity levels of depression were 9/39 for mild, 2/39 moderate depression and 5/39 for moderately severe levels of depression. None of the participants had severe levels of depression. Five of the 39 participants also experienced PTSD while only 2/39 participants had moderate rates of anxiety. None of the participants had potentially concerning levels of anxiety. This is as shown in **figure 4.3.3**

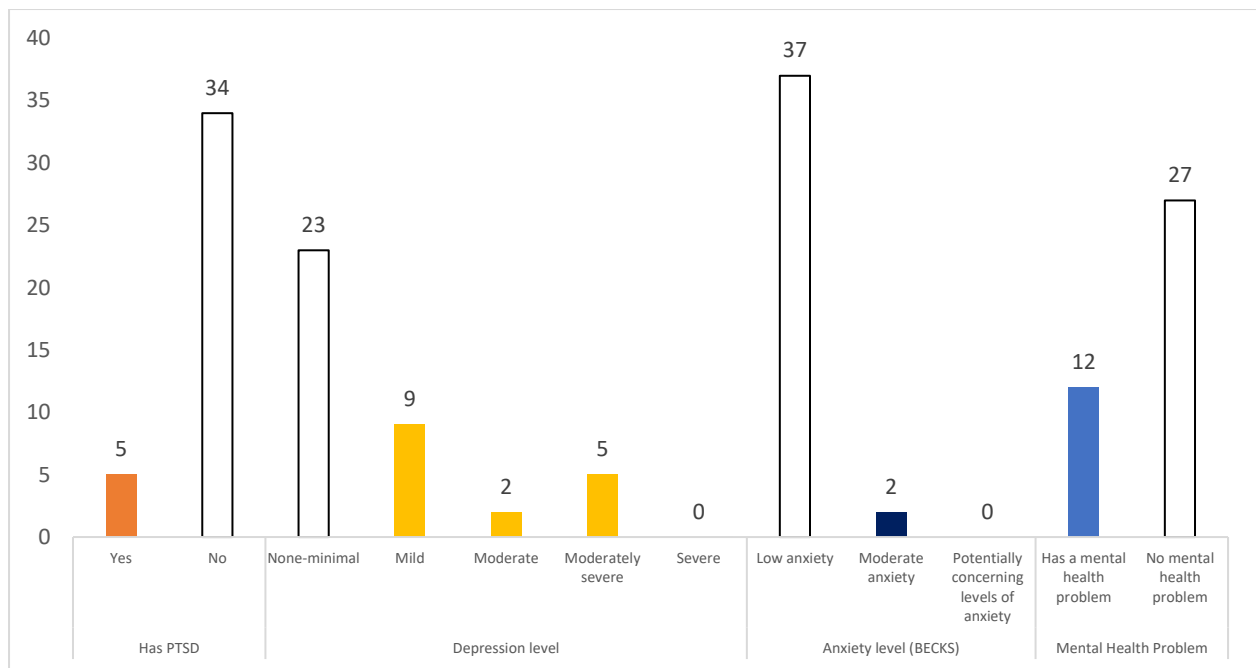


Figure 4.3. 3 Severity levels of PTSD, depression and anxiety disorder

4.3.3 Comorbidity of depression, PTSD and anxiety disorders

A total of 12/39 participants had any of the mental health disorder. Comorbidity of PTSD and depression was observed in 1 participant while comorbidity of PTSD and anxiety was also observed in 1 participant. None of the participants had a comorbidity of depression and anxiety and a comorbidity of all three mental health disorders. This is as shown in the Venn diagram of **figure 4.3.4**

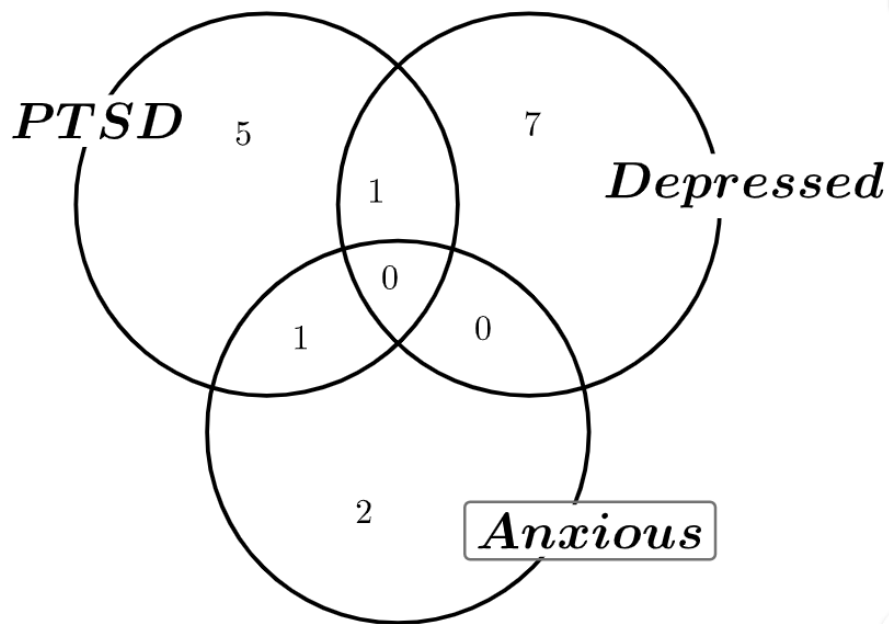


Figure 4.3. 4 Overlap of mental health problems

4.3.4 Depression variables

Since our sample size was small, we looked at how various variables scored on each tool. On PHQ 9 which was utilized to measure depression showed that, the most common symptoms of depression reported were, lack of energy and sleeping problems were the most common symptoms of depression 67% (33/39).

Other common symptoms of depression were feeling down, depressed or hopeless, and poor feeding habits which were reported by more than half of the respondents. The least common symptoms of depression were being suicidal or thinking of hurting oneself 13% (5/39). This is shown in **table 4.3.4** below.

	Not at all		Several days		More than half the days		Nearly every day	
	n	%	n	%	N	%	n	%
Little interest or pleasure in doing things	24	61.5	10	25.6	4	10.3	1	2.6
Feeling down, depressed, or hopeless	17	45.9	15	40.5	4	10.8	1	2.7
Trouble falling or staying asleep, or sleeping too much	12	33.3	20	55.6	0	.0	4	11.1
Feeling tired or having little energy	12	33.3	18	50.0	2	5.6	4	11.1
Poor appetite or overeating	16	45.7	13	37.1	0	.0	6	17.1
Feeling bad about yourself or that you are a failure or have let yourself or your family down	26	66.7	7	17.9	5	12.8	1	2.6
Trouble concentrating on things, such as reading the newspaper or watching television	24	61.5	9	23.1	4	10.3	2	5.1
Moving or speaking so slowly that other people could have noticed. Or the opposite being so fidgety or restless that you have been moving around a lot more than usual	27	71.1	7	18.4	4	10.5	0	.0
Thoughts that you would be better off dead, or of hurting yourself	33	86.8	3	7.9	2	5.3	0	.0

Table 4.3.4. 1 Depression variables among respondents

4.3.5. PTSD Variables

PCL 5 tool was used to measure PTSD. Majority of participants reported experiencing repeated memories of disturbing/stressful experiences, attempts to avoid such thoughts and getting upset upon such memories, being on guard, trouble falling/staying asleep. The least reported symptoms were negative beliefs about self, taking risks, poor memory of stressful experiences, self-blame, replaying stressful experiences and other negative feelings which were present in approximately a third of the respondents.

This is shown in **table 4.3.5**

	Not at	A little	Moderately	Quite	Extremely
	all	bit		a bit	
	n %	n %	n %	n %	n %
Repeated, disturbing, and unwanted memories of the stressful experience?	9 23.1	17 43.6	5 12.8	3 7.7	5 12.8
Repeated, disturbing dreams of the stressful experience?	19 48.7	11 28.2	3 7.7	3 7.7	3 7.7
Suddenly feeling or acting as if the stressful experience were actually happening again (as if you were actually back there reliving it)?	2 25.6	4 10.3	1 2.6	4 10.3	0 0
Feeling very upset when something reminded you of the stressful experience?	11 28.9	14 36.8	8 21.1	4 10.5	1 2.6
Having strong physical reactions when something reminded you of the stressful experience (for example, heart pounding, trouble breathing, sweating)?	18 46.2	11 28.2	4 10.3	4 10.3	2 5.1

Avoiding memories, thoughts, or feelings related to the stressful experience?	1025.6	1948.7	3 7.7	37.7	4 10.3
Avoiding external reminders of the stressful experience (for example, people, places, conversations, activities, objects, or situations)?	1641.0	1230.8	3 7.7	410.3	4 10.3
Trouble remembering important parts of the stressful experience?	2257.9	1026.3	5 13.2	12.6	0 .0
Having strong negative beliefs about yourself, other people, or the world (for example, having thoughts such as: I am bad, there is something seriously wrong with me, no one can be trusted, and the world is completely dangerous)?	2976.3	6 15.8	2 5.3	12.6	0 .0
Blaming yourself or someone else for the stressful experience or what happened after it?	2461.5	1128.2	3 7.7	12.6	0 .0
Having strong negative feelings such as fear, horror, anger, guilt, or shame?	2256.4	1230.8	3 7.7	25.1	0 .0
Loss of interest in activities that you used to enjoy?	2461.5	1230.8	0 .0	25.1	1 2.6
Feeling distant or cut off from other people?	1744.7	1642.1	1 2.6	37.9	1 2.6
Trouble experiencing positive feelings (for example, being unable to feel happiness or have loving feelings for people close to you)?	2052.6	1231.6	1 2.6	37.9	2 5.3
Irritable behavior, angry outbursts, or acting aggressively?	1948.7	9 23.1	8 20.5	25.1	1 2.6

Taking too many risks or doing things that could cause you harm?	6 25 4.1	8	20.5	4	10.3	25.1	0	.0		
Being “superalert” or watchful or on guard?	13 33.3	12	30.8	5	12.8	7	17.9	2	5.1	
Feeling jumpy or easily startled?	21	53.8	11	28.2	2	5.1	4	10.3	1	2.6
Having difficulty concentrating?	21	55.3	9	23.7	4	10.5	3	7.9	1	2.6
Trouble falling or staying asleep?	14 35.9	16	41.0	3	7.7	4	10.3	2	5.1	

Table 4.3.5 1: PTSD Variables among respondents

4.3.6. Anxiety Variables

Fear of the worst happening was the most common symptom of anxiety present in over three-quarters of the respondents. Feelings of dizziness or light-headedness and inability to relax were also reported by more than half of the respondents. Difficulty in breathing, being shaky/unsteady, trembling hands flushed face, wobbling of legs, numbness or tingling, choking, fear of death and indigestion were very rare only appearing in less than one eighth of the respondents. This is shown in **table 4.3.6** below.

	Not at all		Mildly		Moderately		Severely	
	N	%	N	%	N	%	n	%
Numbness or tingling	32	84.2	5	13.2	1	2.6	0	.0
Feeling hot	25	65.8	9	23.7	4	10.5	0	.0
Wobbliness in legs	29	80.6	3	8.3	2	5.6	2	5.6
Unable to relax	18	47.4	14	36.8	4	10.5	2	5.3
Fear of worst happening	9	23.7	20	52.6	6	15.8	3	7.9
Dizzy or lightheaded	17	43.6	16	41.0	3	7.7	3	7.7

Heart pounding/racing	20	51.3	14	35.9	3	7.7	2	5.1
Unsteady	28	71.8	9	23.1	1	2.6	1	2.6
Terrified or afraid	26	66.7	12	30.8	1	2.6	0	.0
Nervous	19	54.3	11	31.4	5	14.3	0	.0
Feeling of choking	34	87.2	4	10.3	1	2.6	0	.0
Hands trembling	33	84.6	5	12.8	1	2.6	0	.0
Shaky / unsteady	33	86.8	2	5.3	3	7.9	0	.0
Fear of losing control	25	67.6	7	18.9	5	13.5	0	.0
Difficulty in breathing	35	89.7	1	2.6	1	2.6	2	5.1
Fear of dying	28	75.7	8	21.6	1	2.7	0	.0
Scared	26	66.7	12	30.8	1	2.6	0	.0
Indigestion	27	71.1	7	18.4	3	7.9	1	2.6
Faint / lightheaded	30	78.9	8	21.1	0	.0	0	.0
Face flushed	32	82.1	6	15.4	1	2.6	0	.0
Hot/cold sweats	29	76.3	5	13.2	3	7.9	1	2.6

Table 4.3.6 1Anxiety Variables among respondents

4.3.7. Mental Health Scores

The average scores for depression were 5 out of the possible 27 score and the highest person scored 18/27 while the average score for PTSD was 17/ 64 and the highest person scored 59/84. The average total mean score for anxiety was 8/63 where by the highest person scored 28/63. This is shown in **table 4.3.7** below.

Surprisingly, the average scores indicated that depression, PTSD and Anxiety were not common in this population since all three average scores were below the cut-off points for clinical intervention.

Score	Mean	Standard Deviation	Median	Minimum	Maximum
Total Depression Score	5	5	3	0	18
Total PTSD Score	17	14	13	0	59
Total anxiety score	8	7	7	0	28

Table 4.3.7 1Mental Health Scores

4.4. Association between sociodemographic characteristics and PTSD, Depression and Anxiety disorders

4.4.1. Factors Associated with Mental Health Scores

To ascertain the relationship between sociodemographic traits and mental health scores, a bivariate analysis was used. Although none of the socio-demographic characteristics appeared to have a statistically significant relationship with total scores for depression, PTSD and anxiety, the median score for gender showed that, females were more likely to suffer depression compared to males ($p=0.078$). The median score for age against anxiety and age and depression shows that, anxiety and depression levels tend to reduce as age increases although it was not statistically significant ($p=0.326$ and 0.650) respectively. Additionally, levels of depression and anxiety seems to decrease as the years of service increase although it was not statistically significant ($p=0.099$ and $p=0.088$) respectively. This is shown in **table 4.4** below.

		Total Depression Score		Total PTSD Score		Total anxiety score	
		Median	p-value	Median	p-value	Median	p-value
Gender	Male	1	0.078	15	0.848	7	0.940
	Female	6		13		6	
Age	18-27 years	1	0.650	9	0.097	9	0.326
	28-37 years	4		16		8	
	38-47 years	5		12		5	
	48-57 years	3		22		3	
Level of education	Secondary	8	0.577	26	0.149	1	0.610
	College Certificate	3		8		8	
	Diploma	3		12		8	
	Degree	5		15		6	
	Post-graduate diploma	2		35		3	
Marital status	Single	4	0.441	11	0.881	7	0.984

	Married	4		15		7	
	Separated/Divorced	3		14		11	
Position at work	Trained paramedic drivers	4	0.831	10	0.958	3	0.241
	EMT	2		13		9	
	Paramedics	4		15		8	
Years of service	0-1 years	2	0.099	8	0.292	4	0.088
	2-5 years	6		12		9	
	6-10 years	3		22		6	
	>10 years	2		19		2	
Working days per week	2-3 days	2	0.297	7	0.213	5	0.895
	4-5 days	4		15		7	
	6-7 days	2		27		7	
Working hours per day	Below 8 hours	2	0.354	9	0.053	9	0.450
	8 hours	3		23		7	
	Above 8 hours	4		10		5	
Working shift	Day only	10	0.120	9	0.120	5	0.566
	Day or night	3		15		7	
	Night only	1		10		0	

Table 4.4. Factors Associated with Mental Health Scores

4.4.2: Factors associated with PTSD, Depression, Anxiety and general mental health

Based on the cut off points, a two-sided Fischer's exact Test was used to determine if there was any relationship between the socio demographic characteristics and those who had PTSD, depression, anxiety disorders or any of the mental health disorder. The results showed that there was no sociodemographic characteristic that was statistically significantly associated with either depression, PTSD or anxiety. Despite having at least one mental health problem

being a common occurrence, no single sociodemographic characteristic appeared to predict this occurrence. More results are shown on the **table 4.4.2** below.

		Depressed	p-value	Has PTSD	p-value	Has anxiety	p-value	Has a mental health problem	p-value
Gender	Male	8.7	0.071	13.0	0.960	4.3	0.791	21.7	0.143
	Female	31.3		12.5		6.3		43.8	
Age	18-27 years	11.1	0.735	11.1	0.360	.0	0.483	22.2	0.940
	28-37 years	16.7		22.2		5.6		33.3	
	38-47 years	33.3		0.0		.0		33.3	
	48-57 years	16.7		0.0		16.7		33.3	
Level of education	Secondary	33.3	0.826	0.0	0.277	33.3	0.191	66.7	0.372
	College Certificate	20.0		20.0		6.7		33.3	
	Diploma	22.2		11.1		.0		33.3	
	Degree	10.0		0.0		.0		10.0	
	Post-graduate diploma	.0		50.0		.0		50.0	
Marital status	Single	11.1	0.301	16.7	0.775	5.6	0.941	22.2	0.176
	Married	29.4		11.8		5.9		47.1	
	Separated/Divorced	.0		0.0		.0		.0	
Position at work	Trained paramedic drivers	22.2	0.884	0.0	0.396	.0	0.724	22.2	0.712
	EMT	14.3		14.3		7.1		28.6	
	Paramedics	18.8		18.8		6.3		37.5	
Years of service	0-1 years	.0	0.225	12.5	0.320	.0	0.693	12.5	0.370
	2-5 years	33.3		13.3		6.7		40.0	
	6-10 years	16.7		33.3		.0		50.0	
	>10 years	11.1		0.0		11.1		22.2	
Working days per week	2-3 days	.0	0.534	0.0	0.229	.0	0.856	.0	0.423
	4-5 days	20.6		11.8		5.9		32.4	
	6-7 days	.0		50.0		.0		50.0	
Working hours per day	Below 8 hours	.0	0.730	0.0	0.843	.0	0.103	.0	0.645
	8 hours	14.3		14.3		14.3		28.6	
	Above 8 hours	20.7		10.3		.0		31.0	
Working shift	Day only	66.7	0.068	0.0	0.721	.0	0.887	66.7	0.311
	Day or night	14.3		14.3		5.7		28.6	
	Night only	.0		0.0		.0		.0	

Table 4.4. 2 Factors associated with PTSD, Depression, Anxiety and general mental health

CHAPTER FIVE: DISCUSSION

5.0 Introduction

This study set out to find out how common PTSD, depression, and anxiety disorders were among paramedics in Nairobi County. To answer this proposition, a structured questionnaire was issued and results analysed using IBM SPSS version 26 software and presented in figures and tables. This chapter presents discussions of the results.

5.1 Sociodemographic Characteristics of Paramedics

This study found majority of participants were males compared to females on a ratio of 3:2, with a mean age of 32.5 and majority worked as paramedics. Similar findings were observed in studies done in the US by Donnelly et. al., (2022), middle East by Alaqeel et. al., (2019), Khazaei et. al., (2021) and Germany by Eiche et. al., (2019). However, the difference between gender in this study was not huge which could be attributed to a culture of more openness and acceptance (Reti et. al., 2021). As opposed to more male dominated cultures who only employ males in the emergency workforce as seen in studies done in Iran and Saudi Arabia (Khazaei et. al., (2021) & Alaqeel, et. al., (2019)).

Alaqeel et. al., (2019) found similar findings. Although their study included males only, majority of the participants were aged 30 years and above, had worked less than 10years (Eiche et. al., (2019); Khazaei et. al., (2021). On the contrary, Donnelly et al., (2022), and Alaqeel et. al., (2019) they found out that majority of participants were married. Paramedics is a male dominated occupation. Nearly 70% of the workforce in all studies included in a systemic review by Hoell et. al., (2023) were of male gender.

5.2 Prevalence Rates and Severity of PTSD, Depression and Anxiety Disorders

In this research, paramedics in Nairobi County showed a prevalence of manifest 17.9% of depression, while 12.8% reported probable PTSD and 5.1% presented with moderate levels of anxiety disorder. As literature has shown, mental health problems among paramedics are high in comparison to prevalence in the general population or among other rescue workers like the police, firefighters, and call center operators (Carleton et. al., 2018). In the current study, approximately 31% of the paramedics met the diagnostic criteria for PTSD, depression, and anxiety disorders. Since these conditions are strongly linked to lower mental health in paramedics, which in turn affects their personal lives, general quality of life, and productivity at work. These results indicate that, organizations working with and utilizing paramedic services should be concerned about this and take necessary measures to curb worsening of the conditions (Lawrence et. al., 2018 & Wild et. al. 2016). Paramedics are also encouraged to take efforts in ensuring they continue to live a productive life both socially and occupationally.

This study's cohort of paramedics had high overall prevalence rates of PTSD, depression, and anxiety disorders, which is consistent with earlier studies. For instance, Wagner et. al., (2020), systemic review study reports mean prevalence rates for PTSD at 18.9%, depression 20.6% and anxiety at 20.0%. Additionally, a systemic review and meta-analysis study by Petrie et. al. (2018) on the prevalence rates of PTSD and other prevalent mental disorders among ambulance workers discovered prevalence rates of 11%, 15%, and 15% for PTSD, depression, and anxiety disorders, respectively. Additionally, these findings demonstrate that paramedics had higher prevalence rates of PTSD, depression, and anxiety disorders than the overall population whose rates vary between 3.7-5.1% for PTSD, 4.4% for depression and 3.6% for anxiety disorders ((baker, 2018 & WHO, 2017). Suggesting that paramedics may be more prone to mental disorders due to the nature of their occupation. However, when PTSD, depression, and anxiety

disorder prevalence rates are compared to the prevalence rates among healthcare professionals, the rates among healthcare professionals appear to be higher. This was shown by a research done among healthcare workers (nurses, medical assistants, midwives, doctors, public health practitioners, medical educators and laboratory technicians in, Palestine, Egypt, Uganda, Iraq, Kenya, Mozambique, Philippines, Albania, Myanmar, South Africa, Tanzania and Zimbabwe by Htay et. al., (2020). Although, this study investigated the mental wellbeing during COVID 19, it found out that a substantive number of participants had mild to moderate severity category. Prevalence rates of severe anxiety and severe depression were 3% and 7% respectively. On the other hand, a study by Onchonga et. al., in 2021 that examined the levels of anxiety and depression among Kenyan healthcare professionals discovered that 35.1% of the participants had mild anxiety and 13.4% had severe anxiety while 9.2% had severe depression and about 53.6% had mild depression. From the above studies, it is hard to make a conclusion on comparison of prevalence rates of these mental disorders among paramedics and health care workers in general since the rates seem inconsistent.

Additionally, according to this current study, the rates of depression (17.9%) and PTSD (12.8%) disorders among paramedics were seen to be more elevated compared to the rates of anxiety disorder whose prevalence was 5.1%. Also, this study reveals a 2.6% rate of comorbidity of PTSD and depression and similar comorbidity rates (2.6%) between PTSD and anxiety disorder. None of the participants had a co-occurrence of PTSD, depression and anxiety disorders. As Petrie et. al., (2018), explains although, anxiety and depression disorders highly comorbid with PTSD, they could also occur in the absence of critical incident exposure which is a prerequisite for PTSD diagnosis (APA, 2013). In addition, depression and anxiety disorder have been cited as predictors of severity of PTSD among emergency work. This is because pre-

existing negative appraisal of life events, tends to escalate with exposure to stressors (Kerai et. al., 2017).

Comorbid mental disorders should be taken into consideration when assessing the mental health of paramedics and other emergency service personnel since they can affect choices about the patient's diagnosis and treatment (Harvey et. al., 2015).

Although anxiety levels in this current study seem low (5.1%), some studies in the literature also outline even lower prevalence rates. For instance, Reid et. al., (2022) cross sectional study among ambulance personnel in Norway using the GAD-7 assessment tool found that participants had 2.9% moderate to severe symptoms of general anxiety disorder. they concluded that, this could be as a result of psychological support paramedics receive at place of work.

However, caution should be taken since the prevalence rates in this study seem elevate. This could be explained by the nature of the study, whereby, our sample size was small. Researches categorize small sample sized studies as low quality because they tend to yield high prevalence rate, while bigger sample sized studies are categorized as high quality and tend to yield low prevalence rate (Wagner et. al. 2020).

5.3 The Association Between Sociodemographic Characteristics, PTSD, Depression and Anxiety Disorders among Paramedics

Fisher's exact test was used to examine gender, age, education level, marital status, job title, years of service, working days per week, and shift as potential risk variables for PTSD,

depression, and anxiety disorders. Unexpectedly, none of the sociodemographic characteristics has a statistical significant association with PTSD, depression and anxiety disorders.

5.3.1 PTSD Outcome

No statistical significance was found on all variables in relations to PTSD. Other studies which found similar outcome include, Fjeldheim et. al., (2014), reported no correlation between gender, age, and population group. Rybojad et. al., (2016), Streb et. al., (2014) and Wagner et al (2020), also report no association between age and PTSD. However, some studies report positive association between gender, age and working hours. For instance, Eiche et. al., (2019), study on wellbeing and PTSD, reports that female gender, older age, and higher total working hours as significantly correlated with lower wellbeing. In support, Reid et. al., (2022) found that PTSD was common among women. Overall, it seems that gender is a variable predictor of PTSD symptoms in emergency medical professionals. Second, most literature on EMS personnel has been conducted among males only. Lastly our results could be as a result of small number of participants, involved in the study sample. Hence, more research is needed to identify the sociodemographic predictors of PTSD.

5.3.2. Depression Outcome

Our study found no statistical significance on all socio-demographic characteristics variables in relations to depression. Courtney et. al., (2013), also found no significant association. Yip et. al., (2016), found that prevalence of depression was higher in women. According to her, this may be because women are more likely and eager to disclose symptoms than men are, where stigma and hegemonic conceptions of masculinity restrict reporting and diagnosis (Affleck et al., 2018 & Whitley. R., 2018). On the contrary, Bentley et. al., (2013) reported a

high prevalence in men. Therefore, further research is required to better understand how gender affects depression among ambulance workers compared to the overall population, where depression is more frequently higher in women (APA, 2013).

5.3.3 Anxiety Outcome

No statistical significance was found on all variables in relations to anxiety disorders. Hence, more work remains to be done. Rankin (2019) also found no significant association between age, gender, marital status, education and work experience and anxiety disorder.

5.4. Limitations and strengths of the study

Limitations of the present study included but was not limited to the following. First, the present study's sample size was small despite its comprehensive viewpoint and examination of a wide range of mental health disorders in paramedics, which was the widest range of mental health disorders in paramedics examined to date in the region compared to other research on the mental health of paramedic personnel. Very few paramedics organisations were willing to take part in this study, despite an extended recruitment period and a targeted recruitment effort. A number of reasons for this would be fear of their working conditions being exposed, organization culture, fear of breach of confidentiality and organization data protection. Studies have shown that, when small number of study sample size is used, it could lead to elevated levels of prevalence rates and disorders under study. Therefore, readers must exercise caution in generalizing this study findings. The results should be viewed as preliminary and used to direct future research. Secondly, another limitation of the present study was use of self-report questionnaires. The reviewed literature contained studies which used different study tools to measure PTSD, depression and anxiety disorders rather than diagnostic assessment. This could raise issues related to instrument variability and reliability of prevalence outcomes. Hence, we

recommend future studies to use diagnostic assessment measures like the Diagnostic and Statistical Manual of Mental Disorders (DSM) and/or the International Classification of Diseases (ICD). Third, this study used convenience sampling method which does not select participants randomly. Therefore, there is potential for self-selection bias. Moreover, response bias could not be ruled out which could threaten the validity of study results. Participants' response styles in self-assessment inventories, including those utilised in the current study, constantly vary.

Some individuals may not have been able to accurately describe how serious their symptoms were due to the stigma associated with mental health. In this investigation, scores that exceeded specific clinical cutoff criteria were only gathered for research purposes and did not result in any therapeutic interventions. Fourth, this study has not made any inferences about the causes of participants' symptoms of depression, anxiety, and/or post-traumatic stress disorder or the standard of care they got before enrolling in the study. It is likely that other factors other than specific stressful workplace events contributed to the participants' reported mental health problems.

The symptoms that participants in this study described could potentially be related to factors unrelated to their jobs. Future research should take this into consideration. Finally, because this study was cross-sectional, although this design is often useful in determining prevalence of a specific occurrence whether it is presumed to exist as a cause and/or as the outcome in the stipulated population, it does not render itself in establishing causality and often it is susceptible to some biases when interpreting the association of variables under study. We accept that we are presuming that the participants' paramedic employment in some way contributed to the

symptoms of the mental disorders we evaluated. Therefore, more studies should be encouraged to ascertain the long-term and specific links between paramedics' mental health and their work.

Despite the above limitations, the present study also presents some strengths. First, this study is the first of its kind in the region opening up the gap for more research in future. Second, it has offered an in-depth view of the prevalence of PTSD, depression and anxiety disorders among paramedics in Nairobi County which could be used to form new research questions and hypotheses in future on the related topic.

Third, it offers insight and awareness on prevalence of mental disorders in paramedics which can inform the development of targeted interventions and support programs to address the unique needs of paramedics.

5.5. Conclusions

In conclusion, studying the prevalence of PTSD, depression, and anxiety disorders among paramedics is crucial for ensuring their well-being, improving patient care, and creating a supportive environment within the emergency medical services community. It provides a foundation for evidence-based interventions, policies, and programs aimed at addressing the mental health needs of paramedics.

Paramedics among other emergency medical service personnel are more often than not susceptible to work associated traumatic events. This study set out to ascertain the prevalence of PTSD, depression, and anxiety disorders among paramedics in Nairobi County in order to address the dearth of literature on the mental health of Kenyan paramedics. Hence, prevalence rates of PTSD, depression and anxiety disorders in this study were found to be 12.8%, 17.9% and 5.1% respectively. Fortunately, these results concurred with other studies in the literature. Although only 31% of paramedics had any mental health disorders, this

study identified at least two co-occurring mental health disorders. The research on the mental health of paramedics should thus record and examine this comorbidity. Our findings are encouraging in that, the prevalence rates are consistent with various researches done on paramedics. Although admittedly limited to a few study sites, the results do highlight the significant mental health challenges faced by paramedics in Nairobi County and suggests a need for targeted psychosocial interventions and support of paramedics.

5.6. Recommendations

Cross-sectional research constitutes the majority of the literature on paramedics' mental health. The results of this study suggest that anxiety, depression, and PTSD symptomatology should be monitored over time in relation to occupational stress, exhaustion, sleep quality, perceived social support, and general quality of life aspects related to paramedics' sociodemographic characteristics and job-related stress.

This will shed light on how quickly these risk variables appear after the onset of anxiety, depression, and PTSD.

For further studies, use of diagnostic assessments in measuring outcome of mental disorders will minimize overestimation and underestimation of prevalence rates.

Future research could incorporate a nation-wide survey, large sample, using control designs and more so a qualitative study for identifying, and providing a thorough description of potential stress in working as a paramedic.

More so, future studies should identify whether there are any existing social support structures already in place to take care of paramedics mental health needs at workplace.

These findings highlight the significant mental health challenges faced by paramedics in Nairobi County and suggests a need for targeted interventions and support programs to address these issues.

REFERENCES

- Abbot, C., Barber, E., Burke, B., Harvey, J., Newland, C., Rose, M., & Young, A. (2015). What's killing our medics? Ambulance Service Manager Program. Conifer, CO: Reviving Responders. Retrieved from <http://www.revivingresponders.com/originalpaper>
- Adriaenssens, J., de Gucht, V., Maes, S. (2012). The impact of traumatic events on emergency room nurses: findings from a questionnaire survey. *International journal of Nursing Studies*, 49(11), 1411–1422.
<https://doi.org/10.1016/j.ijnurstu.2012.07.003>
- Affleck, W.; Carmichael, V.; Whitley, R. Men's Mental Health: Social Determinants and Implications for Services. *Can J Psychiatry* 2018, 63, 581-589, doi: <https://doi.org/10.1177/0706743718762388>
- Alaqueel, M. K., Algerian, N. A., Alnahdi, M. A., & Almaini, R. Y. (2019). Post-Traumatic Stress Disorder among Emergency Medical Services Personnel: A Cross-sectional Study. *Asian Journal of Medical Sciences*, 10(4), 28–31.
<https://doi.org/10.3126/ajms.v10i4.23990>.
- Alghamdi, M., Hunt, N., Thomas, S. (2016). Prevalence rate of PTSD, Depression and Anxiety symptoms among Saudi Firefighters. *Journal of Traumatic Stress Disorder Treatment* 6:1. <https://doi.org/10.4172/2324-8947.1000164>
- American Psychiatric Association (2013). *Diagnostic and statistical manual of mental disorders*. 5th ed. Arlington: American Psychiatric Association
- Bardhoshi, G., Duncan, K.J., & Erford, B.T (2016). Psychometric Meta-Analysis of the English Version of the Beck Anxiety Inventory. *Journal of counselling and development*, 94(3):356-373 [10.1002/jcad.12090](https://doi.org/10.1002/jcad.12090)
- Berger, W., Coutinho, E.S., Figueira, I., Marques-Portella, C., Luz, M.P., Neylan, T.C., Marmar, C.R., & Mendlowicz, M.V. (2012). Rescuers at risk: A systematic review and

- meta-regression analysis of the worldwide current prevalence and correlates of PTSD in rescue workers. *Social Psychiatry, Epidemiology* 47,1001–1011.
- Baron, R. M., Kenny, D. A., 1986. The moderator-mediator variable distinction in social psychological research: Conceptual, strategic and statistical considerations. *Journal of Personality and Social Psychology*, 51, 1173-1182.
- Beck, A. T., & Steer, R. A. (1993). *Beck Anxiety Inventory manual*. San Antonio, TX: Psychological Corporation.
- Bentley, M. A., Crawford, J. M., Wilkins, J. R., Fernandez, A. R., & Studnek, J. R. (2013). An assessment of depression, anxiety, and stress among nationally certified EMS professionals. *Prehospital emergency care: Official journal of the National Association of EMS Physicians and the National Association of State EMS Directors*, 17, 330–338.
- Blevins, C.A., Weathers, F.W., Davis, M.T., Witte, T.K., & Domino, J.L. (2015). The posttraumatic stress disorder checklist for DSM-5 (PCL-5): *development and initial psychometric evaluation. Journal of traumatic stress*, 28, 489-498.
<https://doi.org/10.1002/jts.22059>
- Carleton, R.N., Afifi T.O., Turner, S et. al. (2018). Mental disorder symptoms among public safety personnel in Canada. *Can J Psychiatry* 63(1):54–64.
- Clohessy, S., & Ehler, A.P., (2010). PTSD symptoms, response to intrusive memories and coping in ambulance service workers. *British journal of clinical psychology*, 38 (3), 251-265. <https://doi.org/10.1348/014466599162836>
- Cottler, L.B, Ajinkya, S., Merlo, L.J, Nixon, S.J., Abdallah, A.B., Gold, M.S. (2013). Lifetime psychiatric and substance use disorders among impaired physicians in physicians' health program: comparison to a general treatment population. *J Addict Med* 7(2), 108–112. <https://doi.org/10.1097/ADM.0b013e31827fad9>

- Cunha S, Soares-Oliveira M, Pereira N. (2009). Early psychological intervention in prehospital emergency care systems. *J Emerg Med*, 36(4):404–6.
- Domestic Security, (2010). <https://www.gpo.gov/fdsys/pkg/USCODE-2010-title6/pdf/USCODE-2010-title6-chap1.pdf>.
- Donnelly, E. (2012). Work-related stress and posttraumatic stress in emergency medical services. *Prehospital emergency care*, 16(1), 76-85.
<https://doi.org/10.3109/10903127.2011.621044>
- Donnelly, E. (2016). Work-related stress and posttraumatic stress in emergency medical services. *Prehospital emergency care*, 16(1), 76-85.
<https://doi.org/10.3109/10903127.2011.621044>
- Eaton, G. (2019). Paramedic. *British paramedic journal*, 4(2),1-3
<https://doi.org/10.29045/14784726.2019.09.4.2.1>
- Eiche, C., Birkholz, T., Jobst, E., Gall, C., & Pröttengeier, J. (2019). Well-being and PTSD in german emergency medical services- a nationwide cross-sectional survey. *Plos one* 14 (7). <https://doi.org/10.1371/journal.pone.0220154>
- Fjeldheim, C. B., Nöthling, J., Pretorius, K., Basson, M., Ganasen, K., Heneke, R., & Seedat, S. (2014). Trauma exposure, posttraumatic stress disorder and the effect of explanatory variables in paramedic trainees. *BMC emergency medicine*, 14(1), 1-7.
- Fydrich, T., Dowdall, D., Chambless, D.L (1992). Reliability and validity of the beck anxiety inventory. *Journal of anxiety disorders*, 6(1), 55-61 [https://doi.org/10.1016/0887-6185\(92\)90026-4](https://doi.org/10.1016/0887-6185(92)90026-4)
- Gradus, J.L. (2017). Prevalence and prognosis of stress disorders: A review of the epidemiologic literature. *Clinical Epidemiology*, 9, 251–260.

- Greinacher A., Derezza-Greeven C., Herzog W., Nikendei C. (2019). Secondary traumatization in first responders: a systematic review. *Eur. J. Psychotraumatol.* 10 1–11. 10.1080/20008198.2018.1562840
- Harvey, S.B., Milligan-Saville, J.S., & Paterson, H.M., et. al. (2016). The mental health of fire-fighters: An examination of the impact of repeated trauma exposure. *Australian & New Zealand Journal of Psychiatry*, 50(7):649-658.
<https://doi.org/10.1177/0004867415615217>
- Hellhammer, D.H., Wust, S., & Kudielka, B.M. (2009). Salivary cortisol as a biomaker in stress research. *Psycho-neuro-endocrinology*, 34(2),163-171.
<https://doi.org/10.1016/j.psyneuen.2008.10.026>
- Huang, G., Chu, H., Chen, R., Liu, D., Banda, K.J., O'Brien, A.P., Hen, H., Chiang, K., Chiou, J., Chou, K., (2022). Prevalence of depression, anxiety, and stress among first responders for medical emergencies during COVID-19 pandemic: A meta-analysis. *J Glob Health*, 12:05028 <https://doi.org/10.7189/jogh.12.05028>
- Iranmanesh, S., Tirgari, B., & Bardsiri, H. S. (2013). Post-traumatic stress disorder among paramedic and hospital emergency personnel in south-east Iran. *World journal of emergency medicine*, 4(1), 26.
- Katsavouni, F., Bebetos, E., Malliou, P., Beneka, A. (2016). The relationship between burnout, PTSD symptoms, and injuries in firefighters. *Occupational Medicine*, 66(1):32–37. <https://doi.org/10.1093/occmed/kqv144>
- Kathuri, N.J., & Pals, E., (1993). Introduction to education research. Njoro: Egerton university.
- Kay, J., & Tasman, A. (2006). *Psychological Factors Affecting Medical Condition*. Essential psychiatry. New jersey: john wiley & sons.

- Kenya population and housing census. (2019). Distribution of population by administrative units (volume II). <https://www.knbs.or.ke/2019-kenya-population-and-housing-census-reports/>
- Kerai, S.M., Khan, U.R., Islam, M. *et. al.* (2017). Post-traumatic stress disorder and its predictors in emergency medical service personnel: a cross-sectional study from Karachi, Pakistan. *BMC Emergency Medicine* 17, 26
<https://doi.org/10.1186/s12873-017-0140-7>.
- Khazaei, A., Navab, E., Esmaeili, M., & Masoumi, H. (2021). Prevalence and Related Factors of Post-Traumatic Stress Disorder in Emergency Medical Technicians; a Cross Sectional Study. *Archives of academic emergency medicine*, 9(1), 35
<https://doi.org/10.22037/aaem.v9i1.1157>
- Kroenke, K., Spitzer, R. L., & Williams, J. B. (2001). The PHQ-9: validity of a brief depression severity measure. *Journal of general internal medicine*, 16(9), 606–613. <https://doi.org/10.1046/j.1525-1497.2001.016009606.x>
- Lammerrs, W.J., & Badia, P., (2004). Fundamentals of behavioral research textbook. Uca.edu. <https://uca.edu/psychology/fundamentals-of-behavioral-research-textbook/>
- Lawn, S., Roberts, L., Willis, E. *et. al.* (2020). The effects of emergency medical service work on the psychological, physical, and social well-being of ambulance personnel: a systematic review of qualitative research. *BMC Psychiatry* 20, 348
<https://doi.org/10.1186/s12888-020-02752-4>
- Lazarus, R. S. (1966). *Psychological Stress and the Coping Process*. New York, NY: McGraw- Hill.
- Lazarus, R. S. (1991). *Emotions and Adaptation*. New York, NY: Oxford University Press.

Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping* [Kindle book]. Retrieved from <http://www.amazon.com>

Lazarus, R. S., & Folkman, S. (1986). Reply to Deutsch and Green. *American Psychologist*, 41(6), 715-716. <http://dx.doi.org/10.1037//0003-066x.41.6.715>

Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping* [Kindle book]. Retrieved from <http://www.amazon.com>

Lazarus, R.S., & Launier, R. (1978). *Stress related transactions between persons and environment*. Perspectives in interactional psychology, plenum, New York, https://dx.doi.org/10.1007/978-1-4613-3997-7_12

Maercker, A., Hecker, T. (2016). Trauma-und Gewaltfolgen–psychische Auswirkungen. *Bundesgesundheitsblatt Gesundh. Gesundh*, 59, 28–34.

Marmar, C. R., McCaslin, S. E., Metzler, T. J., Best, S., Weiss, D. S., Fagan, J., & Neylan, T. (2006). Predictors of posttraumatic stress in police and other first responders. *Annals of the New York Academy of Sciences*, 1071, 1–18. <https://doi.org/10.1196/annals.1364.001>.

Marsh, L. (2015). *Understanding Anxiety and Panic Attacks*. London: MIND (National Association for Mental Health).

Mausz, J.; Donnelly, E.A.; Moll, S.; Harms, S.; McConnell, M. Mental Disorder Symptoms and the Relationship with Resilience among Paramedics in a Single Canadian Site. *Int. J. Environ. Res. Public Health* 2022, 19, 4879

Marmar, C. R., McCaslin, S. E., Metzler, T. J., Best, S., Weiss, D. S., Fagan, J., & Neylan, T. (2006). Predictors of posttraumatic stress in police and other first responders. *Annals of the New York Academy of Sciences*, 1071, 1–18. <https://doi.org/10.1196/annals.1364.001>.

McKenny, E.M. (1967). History of motorized ambulance transport. *Milit. Med.*, 132, 819

- Mildenhall, J. (2019). Protecting the mental health of UK paramedics. *Journal of Paramedic Practice, 11*(1), 6-7.
- Mitchell, K.S., Wolf, E.J., Bovin, M.J., Lee, L.O., Green, J.D., Rosen, R.C., Keane, T.M., & Marx, B.P. (2017). Network models of DSM-5 posttraumatic stress disorder: implications for ICD-11. *J Abnormal Psychology 126*(3):355.
- Motreff, Y., Baubet, T., Pirard, P., Rabet, G., Petitclerc, M., Stene, L.E., Vuillermoz, C., Chauvin, P., & Vandentorren, S. (2020). Factors associated with PTSD and partial PTSD among First Responders following the Paris Terror attacks in November 2015. *Journal of psychiatric research, 121*, 143-150.
<https://doi.org/j.jpsychires.2019.11.018>.
- National highway traffic safety administration (2004). EMS agenda for the future (NHTSA web site). Available at:
<https://www.nhtsa.dot.gov/people/injury/ems/agenda/emsman.html>.
- Netherlands Center for Occupational Diseases (2015). *Registration Guidelines: E003 Job-Related Depression*; Netherlands Center for Occupational Diseases: Amsterdam, the Netherlands,
- Ntatamala, M. T. (2021). *Predictors of post-traumatic stress disorder among ambulance personnel in the Western Cape Province* (Master's thesis, Faculty of Health Sciences).
- Onyedire, N. G., Ekoh, A. T., Chukwuorji, J. C., & Ifeagwazi, C. M. (2017). Posttraumatic stress disorder (PTSD) symptoms among firefighters: Roles of resilience and locus of control. *Journal of Workplace Behavioral Health, 32*(4), 227-248.
- Rahman, A., & Sufian, Z.K., (2019). Case study of depression, anxiety and stress among firefighters in Nigeria. *Journal of Education and Social Sciences, 13*(1), 2289-9855

- Rankin, T. (2019). Factors associated with anxiety, depression, burnout, and PTSD in Australian paramedics. <https://ro.ecu.edu.au/theses/2249>
- Reti, T., de Terte, I., & Stephens, C. (2022). Traumatic exposure, work-related stressors and gender as risk factors in the development of psychological distress for ambulance personnel. *Traumatology*, 28(1), 46–55. <https://doi.org/10.1037/trm0000315>
- Ro, H., (2012). Moderator and mediator effects in hospitality research, *International Journal of Hospitality Management*, 31,952-961.
- Rybojad, B., Aftyka, A., Baran, M, Rzońca, P. (2016). Risk Factors for Posttraumatic Stress Disorder in Polish Paramedics: A Pilot Study, *The Journal of Emergency Medicine*, 50(2): 270-276. <https://doi.org/10.1016/j.jemermed.2015.06.030>.
- Patterson, P. D., Weaver, M. D., Frank, R. C., Warner, C. W., Martin-Gill, C., Guyette, F. X., & Hostler, D. (2012). Association between poor sleep, fatigue, and safety outcomes in emergency medical services providers. *Prehospital Emergency Care*, 16(1), 86–97. <https://doi.org/10.3109/10903127.2011.616261>
- Phoenix Australia (2019). St John Ambulance review of workplace mental health risks [Internet]. Melbourne, Australia: University of Melbourne; p. 88. [cited 2019 Mar 22]. <https://stjohnwacomau/docs/defaultsource/corporatepublications/phoenixreportpdf?sfvrsn=2>. Accessed 7 June 2019.
- Petrie, K., Milligan-Saville, J., Gayed, A. *et al.* (2018). Prevalence of PTSD and common mental disorders amongst ambulance personnel: a systematic review and meta-analysis. *Soc Psychiatry Epidemiol*, 53, 897–909 <https://doi.org/10.1007/s00127-018-1539-5>.
- Quevillon, R. P., Gray, B. L., Erickson, S. E., Gonzalez, E. D., & Jacobs, G. A. (2016). Helping the helpers: Assisting staff and volunteer workers before, during, and after disaster

- relief operations. *Journal of Clinical Psychology*, 72(12), 1348–1363.
<https://doi.org/10.1002/jclp.22336>
- Rang, M. (1966). *Anthology of orthopaedics*, 1st ed, Edinburgh: livingstone.
- Ruitenbunrg M, Frings-Dresen M, Sluiter J (2012). The prevalence of common mental disorders among hospital physicians and their association with self-reported workability: a cross-sectional study. *BMC Health Serv Res* 12, 292. <https://doi.org/10.1186/1472-6963-12-292>
- Setia M. S. (2016). Methodology Series Module 3: Cross-sectional Studies. *Indian journal of dermatology*, 61(3), 261–264. <https://doi.org/10.4103/0019-5154.182410>
- Sayre, M.R., Koster, R.W., Botha, M., et. al. Part 5: (2010). Adult Basic Life Support: international consensus on cardiopulmonary resuscitation and emergency cardiovascular care science with treatment recommendations. *Circulation*, 122(16),298-324. <https://doi.org/10.1161/CIRCULATIONAHA.110.970996>
- Schernhammer, E.S., & Colditz, G.A. (2004) Suicide rates among physicians: a quantitative and gender assessment (meta-analysis). *Am J Psychiatry* 161(12), 2295–2302. <https://doi.org/10.1176/appi.ajp.161.12.2295>.
- Skeffington, P.M., Rees, C.L., & Mazzucchelli, T. (2017). Trauma Exposure and Post-Traumatic Stress Disorder withing fire and emergency services in western Australia. *Australian Journal of Psychology*, 69(1), 20-28.
<https://doi.org/10.1111/ajpy.12120>
- Slatten, L.A., Carson, D.K., Carson, P.P. (2011). Compassion fatigue and burnout: what managers should know. *Health Care Management*, 30(4), 325–333.
<https://doi.org/10.1097/HCM.0b013e31823511f7>

- Stanley, I. H., Hom, M. A., Spencer-Thomas, S., & Joiner, T. E. (2017). Examining anxiety sensitivity as a mediator of the association between PTSD symptoms and suicide risk among women firefighters. *Journal of anxiety disorders, 50*, 94-102
- Streb, M., Hällér, P., & Michael, T. (2014). PTSD in paramedics: Resilience and sense of coherence. *Behavioural and Cognitive Psychotherapy, 42*, 452–463. <http://dx.doi.org/10.1017/S1352465813000337>
- Swaen, B. (2022, November 15). *What Is a Conceptual Framework? | Tips & Examples*. Scribbr. <https://www.scribbr.com/methodology/conceptual-framework/>
- Van, A.M., Mancini, C., Patterson, B., & Boyle, M.H. (2008). Post-traumatic stress disorder in Canada. *CNS Neurosci Ther 14*(3), 171–181.
- Vigil, N. H., Grant, A. R., Perez, O., Blust, R. N., Chikani, V., Vadeboncoeur, T. F., & Bobrow, B. J. (2019). Death by Suicide the EMS Profession Compared to the General Public. *Prehospital Emergency Care, 23*(3), 340–345.
- Wagner, S.L., White, N., Regehr, C., White, M., Alden, L.E., Buys, N., Carey, M.G., Corneil, W., Fyfe, T., Matthews, L.R., Randall, C., Krutop, E., & Fraess, P.A. (2020). Ambulance personnel: a systematic review of mental health symptoms. *Traumatology*. <https://doi.org/10.1037/trm0000251>
- Weather, F., Litz, B., Herman, D.S., Huska, J.A., & Keane, T.M (1993). The PTSD checklist (PCL): reliability, validity and diagnostic utility. *Paper presented at the annual convention of the international society for traumatic stress studies*
- Whitley, R. Men's Mental Health: Beyond Victim-Blaming. *Can J Psychiatry 2018, 63*, 577-580, <https://doi.org/10.1177/0706743718758041>
- Wild, J., Smith, K. V., Thompson, E., Béar, F., Lommen, M. J., & Ehlers, A. (2016). A prospective study of pre-trauma risk factors for post-traumatic stress disorder and depression. *Psychological medicine, 46*(12), 2571–2582.

<https://doi.org/10.1017/S0033291716000532>

Yip, J., Zeig-Owens, R., Webber, M. P., Kablanian, A., Hall, C. B., Vossbrinck, M., Prezant, D. J. (2016). World Trade Center-related physical and mental health burden among New York City Fire Department emergency medical service workers. *Occupational and Environmental Medicine*, 73, 13–20.
<http://dx.doi.org/10.1136/oemed-2014-102601>

Zangirolami, R.J., Echeimberg, J. D., & Leone, C. (2018). Research methodology topics: Cross-sectional studies. *Journal of Human Growth and Development*, 28(3), 356-360.

Zuromski, K.L., Ustun, B., Hwang, I., Keane, T.M., Marx, B.P., Stein, B.B., Ursano, R.J., & Kessler R.C (2019). Developing an Optimal Short-form of the PTSD Checklist for DSM-5 (PCL-5). *Depression and Anxiety*, 36(9), 790-800. <https://doi.org/10.1002/da.22942>

APPENDIX I: STUDY QUESTIONNAIRES

PART ONE

You are kindly requested to complete the questionnaire honestly and provide your best opinion.

This questionnaire intends to collect data on the prevalence of PTSD, depression, and anxiety among paramedics in Nairobi County. Kindly tick (✓) appropriately to indicate your honest opinion.

1. Gender
 - a) Male ()
 - b) Female ()
2. Age
 - a) 18-27
 - b) 28-37
 - c) 38-47
 - d) 48-57
 - e). 58 and above
3. Level of education
 - a) Secondary
 - b) College certificate
 - c) Diploma
 - d) Degree
 - e) Post graduate diploma
 - f) Master`s degree
 - g) PHD
4. Marital status
 - a) Single
 - b) Married
 - c) Separate/divorced
5. Position at work
 - a) EMT

- b) Paramedic
 - c) Trained paramedical drivers
 - d) Untrained paramedical Driver
6. Years of service
- a) a). 0-1
 - b) b). 2-5
 - c) c). 6-9
 - d) d). 10 and above
7. working days per week
- a) 2-3
 - b) 4-5
 - c) 6-7
8. working hours per day
- a) Below 8 hours
 - b) 8 hours
 - c) Above 8 hours
9. working shift
- a) Day only
 - b) Night only
 - c) Day or night

PART TWO

This part intends to gather data on the level of depression among paramedics in Nairobi County. Over the last 2 weeks, how often have you been bothered by any of the following issues as stated before? Please tick (✓) the box that indicates you best opinion or views.

	In the past two weeks, how much were you bothered by;	Not at all	Several days	More than half the days	Nearly everyday
1	Little interest or pleasure in doing things				
2	Feeling down, depressed, or hopeless				
3	Trouble falling or staying asleep, or sleeping too much				
4	Feeling tired or having little energy				
5	Poor appetite or overeating				
6	Feeling bad about yourself or that you are a failure or have let yourself or your family down				
7	Trouble concentrating on things, such as reading the newspaper or watching television				
8	Moving or speaking so slowly that other people could have noticed. Or the opposite being so fidgety or restless that you have been moving around a lot more than usual				
9	Thoughts that you would be better off dead, or of hurting yourself				

PART THREE

This section intends to gather data on the level of PTSD among paramedics in Nairobi County. Below is a list of problems that people sometimes have in response to a very stressful experience. Please read each problem carefully and then tick (✓) one of the numbers to the right to indicate how much you have been bothered by that problem in the past month.

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

16	Taking too many risks or doing things that could cause you harm?	0	1	2	3	4
17	Being “superalet” or watchful or on guard?	0	1	2	3	4
18	Feeling jumpy or easily startled?	0	1	2	3	4
19	Having difficulty concentrating?	0	1	2	3	4
20	Trouble falling or staying asleep?	0	1	2	3	4

PART FOUR

This section intends to gather data on the prevalence of anxiety among paramedics in Nairobi County. Below is a list of items is made to test for the symptoms of anxiety. Please carefully read each item in the list. Indicate how much you have been bothered by that symptom during the past month, including today, by ticking (√) the number in the corresponding space in the column next to each symptom.

	In the past month, how much were you bothered by;	Not at all	Mildly	Moderately	Severely
1	Numbness or tingling	0	1	2	3
2	Feeling hot	0	1	2	3
3	Wobbliness in legs	0	1	2	3
4	Unable to relax	0	1	2	3
5	Fear of worst happening	0	1	2	3
6	Dizzy or lightheaded	0	1	2	3
7	Heart pounding/racing	0	1	2	3
8	Unsteady	0	1	2	3
9	Terrified or afraid	0	1	2	3
10	Nervous	0	1	2	3
11	Feeling of choking	0	1	2	3
12	Hands trembling	0	1	2	3
13	Shaky / unsteady	0	1	2	3
14	Fear of losing control	0	1	2	3
15	Difficulty in breathing	0	1	2	3
16	Fear of dying	0	1	2	3
17	Scared	0	1	2	3
18	Indigestion	0	1	2	3
19	Faint / lightheaded	0	1	2	3
20	Face flushed	0	1	2	3
21	Hot/cold sweats	0	1	2	3

APPENDIX II: INFORMED CONSENT

Title of the study: *“Prevalence of PTSD, Depression, and Anxiety disorders among Paramedics in Nairobi County Kenya”.*

Principal investigator: Wambua Redampter Mbuu Nduku

Information on the study

➤ Aim of the study

This research aims at investigating the prevalence of PTSD, Depression and Anxiety disorders among paramedics in Nairobi County. If you agree to participate questions about the stressful events experienced in your line of work will be asked.

➤ Procedure

After reading and signing this consent form, we kindly ask you to fill out the following questionnaire to the best of your knowledge. The information collected will be used for academic purposes only.

➤ Time commitment

You may require 25 - 30 minutes to complete the questionnaire.

➤ Confidentiality

Information collected will be kept from inappropriate disclosure and treated anonymously, while ensuring the greatest possible discretion. To further enhance confidentiality, we ask you not to put your name on the questionnaire.

➤ Voluntary nature of participation

We declare that participation is voluntary and that the refusal to participate has no consequences. Furthermore, you are free to discontinue your participation at any moment in the process.

➤ Possible risks

In this research, risk to participation is kept minimum. However, some questions in this study might trigger painful memories. We assure you that the researcher is skilled enough to help you manage them and if necessary, referral for special care will be made.

Contact person to answer questions about research and the rights of participants.

The principal investigator: Redampter Mbuu Nduku Wambua

Department of Psychiatry, University of Nairobi,

Redemptaw90@gmail.com

+254 728516116

Supervisors:

Dr Teresia Mutavi

Department of Psychiatry, University of Nairobi

E-mail address: TerryMutavi254@gmail.com,

Phone Number: +254722391236

Dr Anne Mbwayo,

Department of Psychiatry, University of Nairobi

E-mail address: ambwayo@uonbi.ac.ke

Phone Number: +254727329904

APPENDIX III: Study timeline

Activities	June To September 2022	October To February 2023	March To April 2023	May 2023	June 2023	July 2023	August 2023
Proposal writing and approval by supervisors and faculty							
Submission of final copy of proposal to ethics and ethics approval							
Data collection							
Data analysis							
Report writing							
Presentation of results and working on panel recommendations							
Submission of final research project							

APPENDIX IV: Budget and Budget Justification

Study budget estimates

CATEGORY	REMARKS	UNITS	UNIT COST (KSH)	TOTAL (KSH)
Proposal development	Printing drafts (paper, cartridge)	1	10,000	10,000
	Proposal copies	6	500	3,000
Data collection	Stationery packs (pens, papers and study definitions)	10	200	2,000
Data analysis	Statistician	1	40,000	40,000
Thesis write up	Computer services	1	3,000	3,000
	Printing questionnaires	123	70	8,610
	Master's Thesis printing and binding costs – UoN library	4	1950	7,800
KNH-UoN Ethics and Research Committee	Application fees	1	2,000	2,000
National Commission for Science and Technology (NACOSTI) permit	Research (academic) Masters - permit	1	1,000	1,000
Transport – Researcher	Transport	8weeks	1,000	8,000
Lunch	Food	8weeks	1000	8,000
Airtime	Airtime voucher	1	1,000	1,000
Hand sanitizers and Facemasks		1	1,000	1,000
Contingency funds				20,000
Total				115,410