An analysis of the strategic communication of emergency medical services within the North West Province

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Mini-dissertation accepted in partial fulfilment of the requirements for the degree *Master of Business Administration* at the North-West University

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Graduation: June 2025

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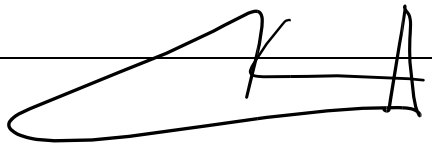
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DECLARATION

SOLEMN DECLARATION OF OWN WORK BY THE STUDENT

Module Name	**Mini-dissertation**
Module Code	MBAC 873
Assignment Title	An analysis of the strategic communication of the Emergency Medical Services within the North West Province
Due date	27 November 2024

I, **Mohau MacPhalen Thamae**, declare herewith that the assignment which I herewith submit to the North-West University in partial compliance with the requirements set for the Master of Business Administration (MBA) degree is my original work, has been text-edited in line with professional communication standards, and has not already been submitted to any other institution for evaluation purposes.

Signature of student:	
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ABSTRACT

This study analysed strategic communication techniques within Emergency Medical Services (EMS) in the North West Province of South Africa. It explores the importance of efficient communication and emphasises the crucial function of contemporary communication technology in enhancing response times and coordination during emergencies. The research employed a qualitative design and an inductive approach grounded in interpretive epistemology to analyse primary data collected from semi-structured interviews with EMS personnel. A deductive approach was used to address two secondary objectives through the literature.

The socio-ecological model (SEM) served as a framework to evaluate the individual, organisational, societal, and policy aspects influencing communication efficacy. The results indicate that mobile phones have emerged as the principal communication device for EMS personnel, augmenting internet-based communication in operational facilitation.

Notwithstanding the benefits of these technologies, restricted access and resource limitations endure, highlighting the desire for dependable alternatives such as two-way radios. The study recommends reintroducing two-way radios as auxiliary instruments, providing mobile devices, and augmenting training programmes for EMS personnel at all levels. These findings aim to assist policymakers and EMS management in improving communication and strengthening emergency response capabilities and outcomes in the North West Province.

Keywords: Strategic communication, Emergency Medical Services, North West Province, Communication System, Mobile phones, Internet communication.

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ACKNOWLEDGEMENTS

I want to express my heartfelt gratitude to several individuals whose unwavering support and encouragement have been instrumental in completing my MBA qualification.

First and foremost, I extend my most profound appreciation to my beloved wife, Nokuzola “Malefa” Thamae, whose constant support, understanding, and encouragement have been my rock throughout these endeavours. I am also immensely grateful to my children, Mpho, Lunga, Karabo, and Thato. Their love and unwavering support have inspired me to achieve my goals.

To my mother, Moliehi Tlhodi, whose boundless love and guidance have shaped me into who I am today, I owe a gratitude that words cannot fully express. Her unwavering support during the trying times of my life and belief in me have been a constant source of strength throughout this journey.

I would also like to acknowledge my late Uncle Au Joseph Thamae and my late Aunt Modiegi Thamae, who played a significant role in my upbringing. Though they are no longer with us, their presence and influence guided me throughout my academic journey.

Finally, I am deeply indebted to Prof Christi Niesing for her invaluable guidance and patience, for pushing me to think critically, and for her expertise throughout the completion of my mini-dissertation. Her mentorship and support have been crucial in navigating the challenges of academic research, and I am profoundly grateful for her dedication to my success. To all these individuals, I offer my sincerest thanks. Your support and encouragement have driven my achievement, and I am forever grateful for your presence in my life.

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DEDICATION

I dedicate this work and success to my mother, whose unwavering support and wisdom shaped my path with love and resilience. To my beautiful wife, you have always believed in me, and your support is highly appreciated. Finally, to all my siblings and children, Mpho, Lunga, Karabo, and Thato, you are my motivation, joy, and most significant legacy. This achievement is a testament to our bond's strength and shared dream. Together, we thrive.

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ACRONYMS AND ABBREVIATIONS

ALS	Advanced Life Support
AUTHeR	Africa Unit of Transdisciplinary Health Research
BLS	Basic Life Support
CAD	Computer-Aided Dispatch
ECC	Emergency Communication Centre
ECP	Emergency Care Practitioner
EMS	Emergency Medical Services
EMT	Emergency Medical Technician
ECT	Emergency Care Technician
ILS	Intermediate Life Support
NWDoH	North West Department of Health
NWU	North West University
POPIA	Protection of Personal Information Act
UAN	Universal Access Number
UK	United Kingdom

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CHAPTER 1: INTRODUCTION TO THE STUDY

1.1 Introduction

This chapter presents the research study, emphasising the strategic communication practices of emergency medical services (EMS) within the North West Province, South Africa. It offers pertinent background information and underscores the study's significance, importance, geographical boundaries, and industry under investigation. The chapter articulates the research question and objectives; it also presents a concise overview of the research methodology, the instruments for data collection, and an outline of the subsequent chapters.

1.2 Background

The effective and efficient provision of public services, especially healthcare, is paramount in modern society, particularly in rural areas. Clients (patients) in rural and urban areas are expected to have access to public facilities at all times; however, these services are not always available when needed (Habibi-Soola *et al*., 2022:1657). Despite South Africa's advanced healthcare services, professionals (clinicians), mid-level workers (administrators), and reputable training institutes, the country continues to face considerable workforce shortages and access constraints (Degenaar *et al*., 2022:715). This is due to public and fundamental healthcare facilities' restricted access to medical ambulance transportation during emergencies. Mechili *et al*. (2021:382) highlight that communication failures between primary and secondary healthcare stages can adversely limit patient management, resulting in extended waiting periods and inadequate coordinated care, which ultimately impacts patient outcomes and satisfaction.

These issues stem from the unequal distribution of health workers between the well-resourced private sector and the poorly-resourced public sector and distributional disparities between urban and rural areas (Habibi-Soola *et al*., 2022:1658). Despite the efforts made by the South African government, individuals in rural and urban regions continue to have restricted access to healthcare facilities, which leads to human mortality (Degenaar *et al*., 2022:710).

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In the 1970s, four provincial administrations, the Orange-Free State, Natal, Transvaal, and Cape Colony, provided EMS services to South Africans (Mohulatsi *et al*., 2023:381).

Throughout this period, EMS was lacking in numerous regions of the country. Emergency Medical Services in South Africa are transforming emergency care education and clinical practice, notwithstanding expressed reservations about service delivery (PBEC, 2018; Rapanyane, 2022; SADoH, 2017). Despite national financing for EMS, rural areas in South Africa require improved service due to financial limitations and insufficient equipment availability (Mohulatsi *et al*., 2023:381).

Given the intensified volatility in the business environment, effective communication is crucial for empowering individuals to take the initiative and improve organisational competitiveness through heightened productivity and sustained growth (Chukwuka, 2015). The cost of communication has significantly decreased due to technological advancements; therefore, employing appropriate communication strategies could yield favourable results for the organisation (Asuelimen & Omohimi, 2019:206). Effective communication is exchanging ideas, thoughts, opinions, knowledge, and data to convey and comprehend the message clearly and intentionally. This notion of effective communication within the healthcare system can be associated with EMS to meet the demands of both rural and urban South African communities. The EMS constantly seek to reduce their response times, as they take primary responsibility for pre-hospital care of life-threatening and emergency medical conditions, including trauma and heart attacks (Khaketla *et al*., 2022). Effective communication enables personnel to comprehend the operational duties of EMS. Martin *et al*. (2011) assert that all employees and managers regard communication as vital to a company's success.

Degenaar *et al.* (2022:710-716) assert that EMS functions as a holistic system, coordinating personnel, facilities, and equipment to deliver efficient and timely health and safety services to individuals experiencing acute illness or injury. Moreover, pre-hospital EMS provides immediate and appropriate aid to patients in emergencies. As part of the traditional trade of first responders, it is understood that EMS is the first point of contact for any assistance required during an emergency and plays a vital role in disaster response (Khaketla *et al*., 2022).

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This study will examine several facets of daily operations, particularly strategic communication related to EMS. It will analyse strategic communication in the North West Province, characterised as an organisation's intentional employment of communication technologies to convey its strategic goals.

1.2.1 Emergency Medical Services in a Global Context

There is a growing demand for EMS globally. To respond to this increasing demand, the EMS communities require adaptable and sustainable model systems that encompass unified standards of practice, training, and results with minimum risk (Sommer *et al*., 2022). Globally, millions of patients seek pre-hospital care each year regardless of the simplicity or complexity of their conditions or injuries. Thus, EMS personnel proficient in Basic Life Support (BLS), Intermediate Life Support (ILS), or Advanced Life Support (ALS), commonly referred to as paramedics in South Africa, conduct prompt assessments and administer treatment to the ill and injured before their transport to a hospital or clinic for additional evaluation (Kim & Oh, 2023). Expertise, proficiency, and discernment are crucial for exceptional emergency medical care. High-quality and skilled paramedics are essential to any healthcare system; thus, numerous research studies on pre-hospital services prioritise human factors, efficiency, and the ongoing enhancement of practice standards.

Emergency Medical Services are divided into two main models worldwide, namely:

- The German-Franco Model, in which physicians staff an ambulance and
- The Anglo-American Model, where ambulances are staffed with EMTs trained in BLS, ILS, or ALS (Sommer *et al*., 2022).

Both models employ contemporary methodologies, tools, and technology to mitigate medical uncertainty and achieve optimal quality in patient-centric pre-hospital care (Sommer *et al*., 2022). Numerous countries utilise these principles to improve their pre-hospital services and emergency medicine while making concessions to deliver excellent pre-hospital care within budgetary limits and existing infrastructural challenges (Mogharab *et al*., 2022:58).

Emergency Medical Services in South Africa function under a multifaceted framework shaped by the German-Franco and Anglo-American styles of emergency treatment. The German-Franco approach, distinguished by ambulances staffed by physicians,

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stands in stark contrast to the Anglo-American model, which generally utilises EMTs trained in BLS, ILS, or ALS (Sobuwa & Christopher, 2019:2). In South Africa, the prevailing model closely resembles the Anglo-American approach, wherein EMS personnel receive training at multiple care levels; however, the system is characterised by considerable challenges, including resource constraints and inconsistencies in training and service provision (Ntsiea, 2019).

The increasing focus on education and professionalisation in the field has influenced the development of EMS in South Africa. The National Emergency Care Education and Training (NECET) policy seeks to establish a cohort of emergency care professionals endowed with the requisite clinical knowledge and decision-making capabilities to improve pre-hospital care (Sobuwa & Christopher, 2019). This initiative is vital for rectifying the historical deficiencies in emergency services, which a lack of formal training and professional acknowledgement has hindered. Consequently, the South African EMS sector has experienced a rise in the number of training providers and a corresponding increase in trained personnel, which is critical for enhancing the quality of care provided to patients in emergencies (Sobuwa & Christopher, 2019).

Since the 1970s, the methodology of emergency healthcare provision in the pre-hospital setting has developed around these two primary models of EMS characteristics (Sommer *et al*., 2022). The categorical distinctions were apparent from the 1970s until the conclusion of the 20th century, during which the Franco-German model of EMS delivery was based on the “stay and stabilise” principle, aiming to provide healthcare services directly to the patient on the scene, stabilising the patient before transporting to the hospital (Pakdaman *et al*., 2023). The Anglo-American model entails the “Scoop and Run” mentality (Pakdaman *et al*., 2023) focusing on transporting the patient to the hospital with minimal intervention at the scene. These models aim to rapidly bring the patient to the hospital with less pre-hospital intervention (Nodirovna *et al*., 2022:184).

Wu and Ho (2022:20) assert that the first-world healthcare model has progressed, leading emergency medical professionals globally to enhance their capabilities in addressing medical and trauma emergencies through modern clinical technologies. The rapid development of medical technology has also reformed international EMS

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systems with the introduction of multifunctional compact monitoring systems, making monitoring patients manageable in an uncontrolled environment of pre-hospital settings (Sommer *et al*., 2022).

1.2.2 Emergency Medical Service in Private Healthcare in South Africa

Physicians frequently engage with elements of EMS systems in routine emergency medical practice. Delivering exceptional treatment in the pre-hospital environment necessitates that emergency personnel stay informed to treat patients before they arrive at the emergency room (Degenaar *et al*., 2022:710). The technical advancements present in the private sector accentuate the inequalities in healthcare provision. The disparity is intensified by private healthcare institutions' ability to provide more attractive pay and better working circumstances, drawing qualified experts from the public sector (Mametja, Letshweni, Semenya, Moyo, Whyte, Bultinck-Human & Moloabi, 2023). The private sector frequently leads in the adoption of breakthrough communication tools, which are less accessible in the public sector due to financial limitations. The private healthcare sector employs skilled and experienced paramedics utilising advanced technologies that are inaccessible in the public sector due to budgetary limitations. Contemporary technology, including digital software utilised by the private sector, enables structured communication among the caller, contact centre, and responding paramedic during emergencies.

1.2.3 Emergency Medical Services in Public Healthcare in South Africa

The South African government offers emergency ambulance services across all nine provinces. The new method grants Emergency Care Technicians (ECT) and Emergency Care Practitioners (ECP) significant flexibility in interdependent practice (Nodirovna *et al*., 2022:182).

The Emergency Care Qualification Framework (ECQF) established by the South African Department of Health seeks to standardise the qualifications and competencies of emergency care personnel, thereby promoting a more systematic approach to emergency care delivery (Rowland & Adefuye, 2022; Sobuwa & Christopher, 2019). The function of ECTs, Paramedics, and ECPs in South Africa is progressively acknowledged as that of independent practitioners. This reflects the paradigm of Paramedic Practitioners in the United Kingdom, where practitioners

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function with a level of autonomy that facilitates critical decision-making in emergency scenarios (Sobuwa & Christopher, 2019; Sobuwa, 2020). The South African EMS system features a variety of practitioners, from Basic Ambulance Assistants (BAAs) to advanced life support paramedics, each contributing significantly to the emergency treatment continuum. The incorporation of these practitioners into a unified operational framework is crucial for efficient emergency response, especially in rural and underserved regions with restricted healthcare access (Tiwari, Naidoo, English & Chikte, 2021; Zaidi, Dixon, Lopez, De Vries, Wallis, Ginde & Mould-Millman 2019).

1.2.3.1 Staffing

The implementation of advanced training programs and the creation of a three-tier qualification system have been crucial in enhancing the standards of emergency care (Rowland & Adefuye, 2022; Sobuwa & Christopher, 2019). This evolution seeks to improve care quality while tackling the issues of large patient volumes and resource limitations typical in the South African healthcare system (Tiwari *et al*., 2021; Christopher, Naicker & Naidoo, 2023). Advanced Life Support providers are assigned to rapid response vehicles to improve response times and are required to be dispatched in support of the ambulance crew to all priority 1(Code Red) patients (those with high-acuity conditions or injuries) (Degenaar *et al*., 2022:703-705). The national objective was to have one staffed emergency ambulance for every 10,000 people by 2010; however, in some parts of the country, this ratio is currently approximately one ambulance for every 30,000 people (Sommer *et al*., 2022).

1.2.3.2 Vehicles

Emergency Medical Services vehicles are essential to the healthcare system, especially in prehospital treatment. These vehicles employed by EMS are predominantly ambulances designed to deliver emergency medical aid and transport patients to clinics and hospitals. The Western Cape Government Emergency Medical Services (WCG EMS) manages a fleet of 261 ambulances, employing around 1,823 personnel across 49 bases, catering to a population exceeding 6 million residents (Alshehri, Pigoga & Wallis, 2020:639). This comprehensive network highlights the significance of EMS in emergency management and the provision of prompt medical care. The ambulances utilised in South Africa exhibit considerable variation, encompassing essential life support (BLS) trucks and advanced life support (ALS)

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units. BLS ambulances are often outfitted with vital medical supplies and manned by essential life support personnel. In contrast, ALS units are furnished with sophisticated medical apparatus and staffed by paramedics skilled in executing more intricate medical interventions (Mould-Millman, Dixon, Burkholder, Pigoga, Lee, de Vries, Moodley, Meier, Colborn, Patel & Wallis, 2021:2).

1.2.3.3 Dispatch

Research demonstrates that the duration for EMS to reach the location and convey patients to medical facilities substantially influences patient outcomes, especially in trauma situations (Möller, Hunter, Kurland & van Hoving, 2018:91). In South Africa, despite possessing one of the most advanced EMS systems in Africa, a significant percentage of patients (49%) continue to depend on private automobiles for transportation to healthcare institutions, indicating possible deficiencies in the EMS response system (Möller *et al*., 2018:91). This dependence on private transportation may result in delays in obtaining essential medical care, highlighting the necessity for enhanced EMS accessibility and response times. Historically, EMS dispatch has originated from various sources and often involved self-dispatch, a practice still utilised by modern operational organisations. The framework centralises dispatch from a minimum of two call centres in major cities across each South African province to provide an optimal response to communities.

1.2.3.4 Time Response

The South African system currently lacks an official response time. A response time of fifteen minutes for high-acuity calls in urban areas is acceptable; however, in rural locations, response times for similar calls can reach up to forty minutes (Thielmann *et al*., 2022).

1.2.4 Emergency Medical Service in South Africa

Emergency Medical Services in South Africa function within a multifaceted healthcare environment marked by considerable obstacles and prospects. The South African healthcare system confronts a “triple burden” of disease characterised by elevated incidences of communicable diseases, non-communicable diseases, and violence, hence requiring a comprehensive and adaptive EMS framework to tackle these complex health challenges (McAlpine, Hodkinson & Fleming, 2020:8). The EMS

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frequently serves as the initial contact for numerous individuals pursuing healthcare, especially in rural regions with restricted access to primary care. This highlights the essential function of EMS in ensuring fair access to healthcare services.

1.3 Emergency Medical Service Responsibilities

The principal duty of EMS is to deliver prompt medical assistance to individuals suffering from acute diseases or injuries. This is especially vital in South Africa, where the healthcare system encounters considerable obstacles, including a high incidence of both communicable and non-communicable diseases, along with interpersonal violence (McAlpine *et al*., 2020:9). The South African Constitution acknowledges emergency treatment as a fundamental human right, highlighting the necessity of an efficient EMS capable of responding efficiently to emergencies (Tiwari *et al*., 2021:3). The Directorate of Emergency Medical Services and Disaster Medicine of the National Department of Health regulates and provides policy advice for EMS, ensuring these services are sufficiently prepared to manage emergencies (Tiwari *et al*., 2021:3).

1.3.1 Dignity of Patients

The EMS must have organisational policies and practices in place regarding patient rights that are consistent with sections 10 and 27 (1) (a) and (3) of the Constitution of the Republic of South Africa, 1996, and Chapter Two of the Act.

1.3.2 Patient Information

Patients must be provided with adequate information regarding healthcare services, including information about the service made available to patients, costs for services, and the quality of service provided (Malatjie, 2023).

1.3.3 Stakeholder's Satisfaction

Processes and methods must be established to facilitate communication of care experiences among stakeholders and patients. Therefore, the EMS station and Emergency Communication Centre (ECC) must implement systems and processes to assess, monitor, and improve their stakeholder's satisfaction with the service provided (Jejaw *et al*., 2023:76).

1.3.3.1 Complaints Management

The EMS must have a system for monitoring, assessing, and responding to complaints as outlined in the sub-regulation (Nodirovna *et al*., 2022:186). Complaints must be

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recorded and analysed to improve the quality of care provided to the patients. Additionally, patients should be provided with information regarding the complaint process.

1.3.3.2 Patient Health Records

It is essential to ensure that patient health records are accessible and can be retrieved when needed. (Jejaw *et al*., 2023:76). The EMS must record accurate patient biographical information and document clinical procedures to facilitate continuity of care.

1.3.3.3 Clinical Management of Emergency Care Provision

An efficient call management system must be implemented to facilitate access to service communication systems, ensuring adequate and appropriate emergency care (Gettel *et al*., 2022:268-269).

1.3.3.4 Dispatch of Emergency Vehicle

Monitoring response times at each call management and dispatch stage is paramount (Degenaar *et al*., 2022:710-711). An effective vehicle dispatch system must be in place to ensure patients have rapid and safe access to services. For sub-regulation, the EMS must have a Computer-Aided Dispatch (CAD) system that facilitates vehicle allocation, routing, and tracking. When an ECC does not have a CAD system, a paper-based system must facilitate vehicle allocation, direction, and monitoring.

1.3.3.5 Response Management

The South African healthcare system is marked by a considerable deficit of healthcare professionals, especially in rural areas, which intensifies the difficulties encountered by EMS in providing prompt and efficient care (Mchunu, Harris & Nxumalo, 2022; Maphumulo & Bhengu, 2019; Tiwari *et al.,* 2021). The disproportionate allocation of healthcare resources, along with elevated patient volumes and insufficient facilities, necessitates a well-coordinated EMS response capable of addressing the varied demands of the community (Tiwari *et al*., 2021; Sobuwa & Christopher, 2019). The allocation of EMS personnel is essential for efficient emergency response.

1.3.3.6 Clinical Leadership

Systems must be implemented to support quality healthcare services and prevent patient safety incidents (Degenaar *et al*., 2022:707).

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1.3.3.7 Facility Transfer

Interfacility transfers must be carefully managed to maximise patient safety and address inadequate documentation of clinical parameters at referring institutions (Sommer *et al*., 2022).

1.3.3.8 Strategic Communication

Strategic communication encompasses all critical communication necessary for an organisation's existence and success. It entails an organisation's deliberate utilisation of communication to engage in strategically significant dialogues around its objectives. Strategic communication is imperative for the organisation or entity, focusing on its strategies to attain specific objectives through communication amidst constraints of limited resources and uncertainty (Werder *et al*., 2018). Communication can play a distinctive role in the formulation, revision, presentation, execution, implementation, and operationalisation of strategies. Sommer *et al*. (2022) assert that effective communication within the healthcare system is essential for EMS to meet the expectations of communities in both rural and urban regions of South Africa.

The role of EMS is to arrange personnel, facilities, and equipment for the effective, coordinated, and timely delivery of health and safety services to individuals experiencing sudden illness or injury (Gettel *et al*., 2022:264). Effective communication enhances comprehension of the essential responsibilities. Furthermore, pre-hospital EMS delivers prompt and appropriate assistance to patients in emergencies. Emergency Medical Services play a vital role in disaster response as part of the traditional duties of first responders (Malatjie, 2023). Research studies have demonstrated that heightened "awareness" alone cannot promote adopting new habits. This bottom-up communication framework necessitates participatory communication that engages the community, fosters involvement, employs evidence-based advocacy and prepares for risk communication to guarantee effective communication, health, and development (Sommer *et al*., 2022).

The significance of communication in health and development is recognised, highlighting the imperative of strategic communication to inform, educate, and influence (Jejaw et al., 2023:76). Targeted communication strategies are developed to leverage various resources to achieve desired objectives in each context by addressing several health and development challenges, including illness management

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issues. Research indicates that a community-centred examination of risk factors and the advancement of operational research communication theories have improved approaches and practices for outcome-oriented health and development communication. Consequently, strategies have been explored to enhance the understanding of strategic communication's role in development and health, especially in disease management. This gap is especially alarming due to the essential function that efficient communication serves in emergency medical responses, which can profoundly influence patient outcomes. The survival of patients undergoing out-of-hospital cardiac arrest (OHCA) significantly depends on a coordinated response that encompasses early emergency recognition, swift activation of emergency medical services (EMS), and efficient communication among all stakeholders in the care continuum (Li, Li, Li, Cai, Liu, Li, Fan & Cao, 2023). The lack of research on strategic communication in EMS highlights the necessity for focused investigation to comprehend and enhance these procedures, especially in areas such as the North West Province.

1.4 Problem Statement

Emergency Medical Services are vital for timely medical assistance during emergencies, significantly impacting patient survival and recovery rates. Effective strategic communication is essential for ensuring coordination, rapid responses, and optimal resource allocation within EMS. In the North West Province, significant challenges arise due to the complexities of geographic distribution, diverse demographic populations, and limited resources. Despite the critical importance of these communication systems, there is a notable lack of comprehensive studies assessing the effectiveness and challenges of strategic communication within EMS operations in this province.

The present circumstances have engendered disillusionment within communities regarding EMS, as there have been reports of patients allegedly succumbing without any reaction from EMS (Nodirovna *et al*., 2022:184). The North West Province Department of Health has training facilities, yet there is a substantial competency deficit in the development and training of paramedics. Moreover, there are apprehensions regarding the departure of trained emergency professionals to other provinces due to employment churn. Research has highlighted the shortcomings in

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the existing quality management frameworks within South African EMS, which are frequently obstructed by inadequate communication, inefficient leadership, and insufficient transparency (Howard, Cameron, Wallis, Castrén & Lindström 2020:3).

Clear, continuous communication is crucial in emergency management, as emergency workers heavily rely on radio interoperability (Burroughs, 2017). Achieving effective integration communication is partially constrained due to inadequate bandwidth. As a result, emergency responders involved in a crisis frequently use their cell phones and social media as quick and dependable means to communicate the events, actions taken, and outcomes of the scenario (Brengarth & Mujkic, 2016; Tuite, 2012).

Contemporary communication technology, encompassing computerised dispatch systems and real-time data sharing, has improved operational efficiency in emergency services. However, the extent of EMS adoption and utilisation of these technologies in the North West Province remains insufficiently researched. Understanding these aspects is essential for recognising potential barriers to the implementation and developing tailored solutions that could enhance the overall efficiency and effectiveness of EMS communication in the province.

The existing communication mechanisms between the communities and EMS require fundamental adaptation. The necessity for a robust quality improvement framework is clear, as current systems are nascent and necessitate substantial enhancement to satisfy the requirements of a swiftly evolving healthcare landscape (Howard *et al*., 2020:4). The COVID-19 epidemic has intensified these issues, exposing institutional deficiencies and underscoring the urgent necessity for adjustments to enhance healthcare delivery (Christopher, 2023). Emergency Medical Services systems are initiated by a civilian utilising a Universal Access Number (UAN) to contact an emergency medical dispatch centre, where operators employ a systematic triage procedure to assess the severity of the EMS response. The EMS system can be beneficial when resources are utilised for critically ill patients. However, there is a rising trend in ambulance transports for non-emergency cases. This burdens the hospital system, congesting emergency departments with non-critical patients. It further diminishes the effectiveness of already-limited EMS systems, often leaving no units available to respond to additional incoming calls.

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This study analyses the strategic communication practices of EMS in the North West Province, highlighting principal strengths, limitations, and potential for enhancement. The findings will provide policymakers and EMS managers with measures to improve communication systems while enhancing emergency response outcomes.

1.5 Research Objectives

The objective was to analyse the efficacy of strategic communication methods in EMS within the North West Province, emphasising their influence on response times and coordination.

1.6 Secondary Objectives

To attain the primary purpose, the following secondary objectives will be addressed:

- To identify the main challenges and obstacles to effective communication faced by EMS workers in the North West Province.
- To assess how modern communication technologies, like digital dispatch systems, can be used to improve EMS coordination and operations within the province.
- To examine avenues for augmenting communication tactics that may enhance the efficiency and responsiveness of EMS in the North West Province.
- To provide recommendations for policymakers and EMS managers on strategies for optimising communication practices in rural and resource-limited areas.

1.7 Research Question

The primary research question for this study is:

How effective are the existing strategic communication practices of EMS in the North West Province, and what improvements can be made to enhance their efficiency and emergency response outcomes?

1.8 Classification of the Field of the Study

This study examines the communication techniques and obstacles encountered by EMS operations in the North West Province of South Africa. The research focuses on the public health sector, specifically targeting EMS, including dispatch centres, field responders, and their collaboration with other public healthcare facilities.

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1.8.1 Field of the Study

The primary subject addresses the challenges of effective communication within EMS, emphasising the significance of strategic communication for coordinating activities, ensuring timely responses, and incorporating advanced communication technology to enhance reaction times and operational efficiency. The study examines the impact of these communication methods on the efficacy of emergency response and patient outcomes. The emphasis is on operational management, particularly in public healthcare administration within the North West Province.

1.8.2 Sector/Industry

The study analyses communication practices, technologies, and obstacles within EMS operations in the North West Province, emphasising the comprehension of internal and external communication dynamics. It further seeks to elucidate how effective communication techniques may augment emergency response services, pinpointing essential areas for enhancement to serve the provincial population better. The study relates to EMS in the public sector and excludes the private sector.

1.8.3 Geographical Demarcation

Holman and Wilholt (2022:212) contend that demarcation involves differentiating between research influenced by suitable conditions and that impacted by unsuitable ones. Considering this notion, it is imperative to delineate the study domains that are vital for preserving geographical accuracy. The geographic region of interest is the North West Province in South Africa.

1.9 Research Methodology

This section explains the study's research design, methodology, and framework, outlining the systematic data collection and analysis approach. It addresses the significance of the recruitment process and the imperative of acquiring informed consent. This section provides a brief synopsis of the selection of participants and the evaluation of data-gathering methods. Chapter 3 will provide a thorough methodology for this research.

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1.9.1 Research Design

According to Gupta and Gupta (2022:20), research designs are plans and procedures for research that span the decision from broad assumptions to detailed data collection and analysis methods. The study will follow a qualitative research approach.

According to Mey (2022:21-25), qualitative research explores and understands the meaning individuals or groups ascribe to a social or human problem. This method makes knowledge claims based on constructivist perspectives and collects open-ended merging data to deliver themes from the data. Qualitative research employs postpositivist assertions to generate knowledge. The research process encompasses formulating questions and methodologies, collecting data within the participant's environment, and conducting inductive data analysis that progresses from specific instances to overarching themes. Additionally, it includes the researcher's interpretation of the significance of the data (Gupta & Gupta, 2022:34-35).

This research employed an inductive methodology consistent with the interpretive epistemological framework (Saunders *et al*., 2016). Figure 1.1 illustrates that a researcher has two methods for formulating a new theory: deduction or induction (Trochim & Donnelly, 2008:22). In deductive reasoning, a hypothesis constitutes the initial phase, followed by the formulation of a research method to evaluate that theory. This approach is termed a top-down strategy (Trochim & Donnelly, 2008:23). The second technique, termed inductive theory-building, commences with an extensive study that identifies patterns and correlations to develop a hypothesis about a specific event; it is frequently referred to as the bottom-up strategy (Trochim & Donnelly, 2008:23). Interpretivist principles were integrated into the investigation of textual material through an inductive methodology.

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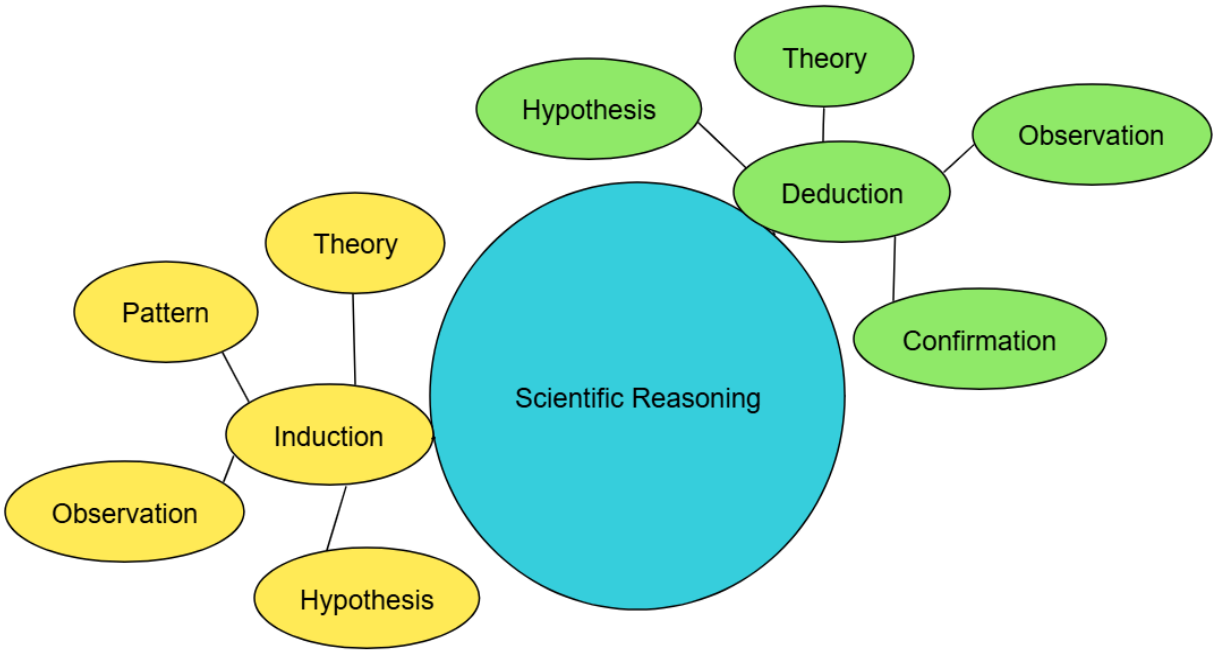


Figure 1.1: Diagram adapted to illustrate Inductive and Deductive Reasoning (Trochim & Donnelly, 2008:23)

The goal of qualitative research design studies is to summarise events in the everyday terms of those events. Researchers engaged in qualitative descriptive studies must maintain a strong connection to their data to emphasise the explicit meanings of words and events.

1.10 Methodological Choice

This study deployed a qualitative research design, generally linked to the interpretivism research paradigm. This design emphasises a smaller sample's subjective perspective and beliefs (Wiid & Diggines, 2013:87). This methodology is optimal for collecting descriptive data that may be evaluated for patterns, themes, and relevance. Qualitative methods enable researchers to investigate complex, human-centred dimensions through several approaches, including narrative analysis, grounded theory, and ethnography (Hendren, Newcomer, Pandey, Smith, & Sumner, 2023:469). This method allows researchers to collect data from various sources through interviews and focus groups, including life experiences, revealing the complexities of social issues that quantitative methods can neglect. Qualitative research may elucidate the contextual significance of findings, ensuring that community needs and values are considered (Jenkins, Slemon, Haines-Saah, & Oliffe, 2018:1970). This methodology is appropriate for this study to investigate the

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phenomena in its natural circumstances, aiming to extract significant insights from the collected data to fulfil the objectives and answer the research question.

Qualitative descriptive designs comprise a diverse yet logical amalgamation of sampling, data collecting, analysis, and representation methodologies. Qualitative investigations frequently corroborate circumstantial assumptions, offering a more profound comprehension of the value and influence of programs beyond conventional analysis (Mundey, Dopp, Slemaker, Beasley, Silovsky, & Eisenberg, 2023:18). This is particularly relevant in sectors such as healthcare, where patients' emotional and psychological states can profoundly affect outcomes from treatment. Qualitative techniques enable researchers to capture these aspects, providing insights that can improve the design and execution of the intervention.

This method is optimal when clear descriptions of phenomena are required. Processual reliability, which includes all research stages from conceptualisation to data collection and analysis, can significantly enhance the quality of qualitative health research (Hayashi, Abib, Hoppen & Wolff 2021:3).

1.11 Population and Sampling

Collis and Hussey (2014) define a sampling frame as a record of the population from which a sample was extracted. A sample is a collection of people, things, or items selected for measurement from a larger population (Cash *et al*., 2022). The target population for this study was the EMS in the North West Province of South Africa. Participants were purposively selected using criteria sampling to identify information-rich cases aligned with the research objectives. The participants included EMS personnel. This research employed a purposeful non-probability sampling strategy, and the researcher chose participants according to their familiarity with the specified features (Latham, 2007). Participants were selected based on their experience and knowledge of the public health emergency work environment. The sample comprised of 15 participants who were assigned to the following groups:

- EMS paramedics were selected based on their direct experiences with emergency communication techniques and challenges, which yielded essential insights into the research topic. Participants were recruited from various districts and expertise levels to provide a range of opinions.

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- EMS dispatch officers who managed emergency calls and the deployment of first responders. Their experiences illuminated communication deficiencies that may affect service delivery.

Purposive sampling is based on the notion that selecting ideal cases for the study produces more comprehensive data, with research results directly dependent on the selected instances. Purposive sampling is a systematic selection of persons based on particular qualities, utilising a non-random methodology (Mishra & Alok, 2022:16). It is a strategic sampling technique that aims to identify “information-rich cases” to fulfil the study objectives and successfully address the research issue.

Maximum variance sampling within these groups included various criteria such as age, gender, race, experience, and qualifications. This approach improved the transferability of results. Participants were selected by stratified purposive sampling, and interviews were conducted until data saturation was reached. Stratified purposeful sampling seeks to capture notable variances rather than ascertain a common core, although the latter may also arise during analysis (Hendren *et al*., 2023:473). Data saturation, characterised by information redundancy or the juncture at which no new themes or codes arise from data, is a fundamental concept in thematic analysis (Mishra & Alok, 2022:23).

Speight, Caiola, Tyndall & Scott (2022) assert that sample size and saturation criteria must be informed by stratification factors, which are considerations that researchers utilise when choosing participants to yield thorough insights into the study subject. This methodology enables researchers to elucidate the subtleties of diverse experiences and viewpoints, especially in investigations involving social dynamics and power connections. Moreover, Al-Walah, Donnelly and Heron (2024) emphasise that utilising homogeneous samples might be advantageous in qualitative research, particularly when prioritising data depth above volume. This suggests that stratification can be employed deliberately to ensure the sample accurately represents the intricacies of the researched population, hence improving the validity of the results.

1.12 Data Collection Method

An interview guide, described as an outline of questions and topics that serve as a framework for a semi-structured interview, was adopted to collect data (Ahmadin,

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2022:110). The guide ensured consistency across interviews. Semi-structured interviews were utilised as this study's primary data collection method. Pajo (2022:18) explains that a semi-structured interview is a qualitative data collection method that involves prepared open-ended questions to guide discussion while allowing flexibility to ask follow-up questions and probe for more detail based on participant responses. Open-ended questions allowed participants to respond in their own words rather than choose from fixed options (Ahmadin, 2022:109), eliciting richer, more descriptive data. This format allowed the researcher to prepare an interview guide with open-ended questions to explore participants' perspectives and enable follow-up questions and discussion. Follow-up questions were asked to clarify and expand on points raised by participants during the interview. Follow-up questions emerged spontaneously based on interview dynamics.

Individual interviews were conducted to encourage participants to express their candid insights. Each session took place in a private room with only the researcher and the participant present, ensuring privacy and confidentiality. Interviews lasted approximately 30 to 45 minutes. Following participants' permission, the researcher audio-recorded the sessions and transcribed the interviews verbatim. Verbatim transcription involves converting audio recordings into text transcripts by accurately copying the spoken words from interviews (Pajo, 2022:12). This method establishes a precise account of the interview material. Participants were informed they could refuse to answer questions or withdraw from the study without consequences. The researcher delineated methods to safeguard confidentiality, including the de-identification of transcripts, the use of participant codes, and the secure storage of data.

Inquiries centred on participants' experiences and viewpoints concerning the research objectives and questions. Demographic inquiries were confined to those necessary for characterising and contextualising the sample, including role, years of experience, and location. The researcher fostered rapport and encouraged subjects to share candidly. Saturation was attained with the seventh person; however, an eighth participant was included. Saturation refers to the stage in data collecting when no significant new information, codes, or themes arise from further data (Ahmadin, 2022:113). Saturation signifies that a sufficient sample size has been attained. The researcher continuously

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evaluated transcripts during data collection to ascertain saturation, identifying when new themes or information ceased to emerge. Several strategies were deployed to minimise potential risks:

- Providing clear information about the study purpose and procedures during recruitment.
- Allowing participants to select the interview time and location.
- Reminding participants that they could skip questions or end the interview.
- Debriefing after the interview and checking on participant well-being.
- Securely storing data and materials related to the study.

These approaches were structured to collect data responsibly and ethically by proactively addressing privacy, confidentiality, informed consent, and participant rights in the specified procedures.

1.13 Data Analysis

The content analysis involves examining the information collected from notes and interviews to discern the predominant themes emerging from participant comments (Kumar, 2018). High-quality research must generate interpretations consistent with the collected data (Hendren *et al.*, 2023:475). Data analysis entails interpreting textual and visual data. It involves data preparation for study, conducting extensive research, and progressively deepening the comprehension of the data. The continuous process requires constant reflection on the data, posing analytical inquiries, and composing memoranda during the study. Data analysis entails the collection of open-ended data through inquiries and the subsequent development of an analysis derived from the information provided by participants (Pajo, 2022:18).

Kumar (2018) delineates a four-step content analysis methodology as follows:

- Step 1: Identify the main themes. After identifying the meanings of each participant's descriptive response to a question, it is necessary to sift through them to create overarching themes that consider these meanings.
- Step 2: Give each of the significant themes a code. Assigning codes to the major topics will help the researcher count the times a subject has come up during the interviews.

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- Step 3: Sort the answers into groups based on the main themes. The interview responses were categorised into groups based on the main themes that emerged from the thematic analysis.
- Step 4: The main themes discovered during the content analysis phase are covered in the main body of the empirical study of the dissertation, along with theme integration.

This approach ensured that data was analysed accordingly and that the themes and codes extracted answered the research question and the study's objectives. Data analysis followed an inductive thematic approach consistent with the qualitative methodology (Pajo, 2022:18).

The researcher transcribed the audio recordings of the semi-structured interviews verbatim. Initial open coding was performed to identify salient points and recurring ideas relevant to the research objectives. The codes were compared and organised into broader categories and themes.

Hofstee (2018) contends that it is crucial to elucidate the data analysis method to the reader before presenting the conclusions, as this enhances their comprehension of the study. According to Lincoln and Guba (1985), data in qualitative research must be dependable and trustworthy and demonstrate reasonableness, legitimacy, and integrity. The analysis entails extracting themes from the participants' thinking around those emerging topics (Gupta & Gupta, 2022:23). Thematic analysis is a method through which researchers identify various interconnections between the data and the developing themes. A primary advantage of thematic analysis is its systematic methodology, which generally encompasses several discrete phases. As outlined by Braun and Clarke (2022), the process initiates with familiarisation with the data, proceeds to the generation of initial codes, followed by the identification of themes, the review of themes, the definition and naming of themes, and culminates in the production of a report (Bailey, Knight, Koolmatrie, Brubacher & Powell, 2019:188). Mishra and Alok (2022:29) assert that data analysis commences concurrently with data collection.

Thematic analysis was employed to evaluate and examine the transcribed interviews. A more detailed analysis is presented in Chapter Three. Vaismoradi *et al*. (2013:398)

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assert that thematic analysis facilitates identifying and interpreting concepts shared by participants. The data were systematically organised and analysed manually.

1.14 Ethical Consideration

Ethical considerations are a collection of principles that govern a researcher's study designs and procedures in research (Drolet *et al*., 2023:278). When gathering data from individuals, scientists and researchers must always follow the rules (James, 2023:335). Mohd Arifin (2018:30) contends that all research investigations must safeguard human participants by adhering to suitable ethical guidelines. In this study, the safety and privacy of participants were paramount. The anonymity of participants was maintained in all released materials through designations like Participant One or Participant Two. The research conformed to all ethical norms, including adherence to the Protection of Personal Information Act (POPIA).

1.14.1 Beneficence and Non-maleficence

Before data collection, the researcher interacted with each participant to confirm their participation would not induce distress. All participants were informed of the ethical considerations related to the research process.

1.14.2 Risk/Benefits Analysis

A fundamental ethical obligation in medical research is that the risks to individual participants must not be disproportionate. Although this need is widely supported, its implementation remains contentious (Drolet *et al*., 2023:280). The study posed no risk. Instead, the project enhanced service delivery for participants and communities through the North West Department of Health.

1.14.3 Permission and Informed Consent

Informed consent is a crucial ethical and legal requirement for research involving human participants. Obtaining consent requires informing participants of their rights, the study's objectives, the procedures involved, potential risks and benefits, the study's expected duration, and the confidentiality level concerning personal identification and demographic data.

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Providing this information to participants ensures that participation is entirely voluntary (Drolet *et al.*, 2023:283). The technique of informing participants of all relevant aspects of the study is essential for their decision-making.

Participants were given all the relevant information related to the study, including the benefits, potential risks, if any existed, and the purpose of the study. Participants were allowed to ask questions freely, and the researcher emphasised that participation was based on willingness. Participants were told they could decline from the research study at any time or stage without impacting their well-being or standing. Permission was sought from the Department of Health North West, and the researcher was directed to where the participants were based.

1.14.4 Confidentiality and Anonymity

Ethical considerations encompass the safeguarding of subjects and the adherence to ethical research norms. The four ethical principles of autonomy, non-maleficence, beneficence, and justice were initially highlighted (Drolet *et al*., 2023:274). These principles establish the foundation for safeguarding participants in qualitative research.

Yu *et al*. (2022:245) assert that the principle is fundamental to societal convictions regarding the significance of individuals and their entitlement to privacy in personal matters. Assuring someone of confidentiality signifies that the communicated information will remain undisclosed or, at minimum, not shared without consent. The effectiveness of anonymisation is contingent upon the research situation (Liu *et al*., 2023:482).

1.14.5 Conflict of Interest

A conflict of interest arises when the objectives of two parties diverge or when an individual can gain personal advantages from decisions made in a professional context, leading to the undue influence of a secondary interest on the primary interest (Golladay & Jain, 2022). The researcher had no conflicts of interest related to the study.

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1.14.6 Monitoring

To maintain the integrity of the study effort, the researcher has systematically overseen compliance with all ethical norms using a self-created checklist. The researcher was accessible and amenable during all phases of the study for unannounced evaluations of research ethics-related activities by the Research Ethics Committee or its representatives. The monitoring encompassed signed informed permission forms, gathered data, documented individual interviews, and other sanctioned research methodologies.

1.14.7 Rigour – Validity and Reliability

Qualitative validity refers to the researcher verifying the accuracy of findings through specific methods, whereas qualitative reliability signifies the consistency of the researcher's methodology across several research and projects (Wright, 2023:12). Conversely, the validity represents a strength of qualitative research, contingent upon assessing the accuracy of findings from the perspective of the account's readers. Numerous terminologies in qualitative literature relate to this concept, such as trustworthiness, authenticity, and credibility, rendering it a contentious subject (Wright, 2023:15). Qualitative generalisation is utilised infrequently in quantitative research, as this approach does not seek to extend findings to specific locations or contexts outside those under investigation (Ahmadin, 2022:110).

Trustworthiness refers to the quality, precision, and correctness of results in qualitative research. This study employed a qualitative technique. Conducting an audit trail will ensure rigour in this study. The researcher engaged an external auditor to transcribe the audio from the online interviews, in addition to the researcher transcribing the same recording, to provide a data audit trail. Comprehensive records are maintained, allowing moderators to examine and validate research findings for reporting analogous conclusions. This entails preventing researcher bias from influencing the interpretation of participants' statements to conform to a specific narrative.

1.15 Contribution of the Study

Upon final analysis and submission, the study yielded the following contributions:

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1.15.1 Strategy Formulation

Recommendations were provided to address the issues stemming from inadequate communication within the EMS in the North West Province. Chapters 4 and 5 articulate all these recommendations.

1.15.2 Policies

A policy was established following these recommendations.

1.16 Limitations and Delimitations of the Study

Theofanidis and Fountouki (2018:156) define limitations as potential problems in a study that frequently lie outside the researcher's control, including aspects linked to research design, funding, or external influences. This study examined the strategic communication strategies of EMS in the North West Province. However, several limitations emerged from the study's scope and environment. The availability and reliability of data from EMS operations were significant constraints, influenced by disparities in communication infrastructure across different locations within the province. Additionally, the study did not consider variations in communication patterns between public and private EMS providers but concentrated solely on public sector services. The researcher was constrained by time limits, which precluded field study across the province, resulting in a sample size of 15 participants.

Theofanidis and Fountouki (2018) describe delimitations as boundaries established by the researcher to clearly define the study area, ensuring that the research objectives remain achievable. This study's primary delimitations concentrated solely on EMS communication patterns within the North West Province, intentionally excluding comparisons with other provinces or national data. The focus was on the communication among dispatch centres and EMS personnel and their collaboration with public healthcare facilities. This targeted approach enabled a more thorough analysis of strategic communication challenges and practices within emergency services, intending to generate insights relevant to the province's distinct geographical and operational context.

1.17 Structure of the Document

This mini-dissertation is systematically organised into five chapters, detailed as follows:

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Chapter One delineated the significant problems and deficiencies in strategic communication techniques within EMS, particularly emphasising the North West Province. It underscored these obstacles and stressed the necessity for stakeholders, including EMS personnel, healthcare administrators, and policymakers, to follow best practices for effective communication. The chapter specified the research question, defined the problem statement, and discussed the study objectives. It summarised the research methodology, data sources, and the analytical approach to examining communication practices.

Chapter Two expanded the discourse by examining the integration of strategic communication methods within EMS into the broader context of public health systems and emergency response strategies. It underscored the essential function of governmental regulations, communication protocols, and standards in facilitating coordinated and effective emergency responses. The chapter emphasised the necessity of a cooperative strategy among EMS providers, communication technology companies, and legislators to enhance communication systems. This method entailed evaluating communication requirements, analysing technological options, and making educated choices regarding adopting and utilising suitable communication technology. Chapter Two emphasised the necessity of evaluating the long-term sustainability and maintenance of communication technologies.

Chapter Three outlined the research approach and encompassed the empirical investigations conducted. It examined the essential elements of the research, methodologies, and inherent constraints, including the data-gathering instrument. The chapter further elucidated the sampling methodologies and summarised the data analysis procedure.

Chapter Four presented the research findings and discussions, encompassing coding analysis. The data was analysed, evaluated, and presented in tables and figures to facilitate understanding of the findings.

Chapter Five summarised the study, delineated its advantages and disadvantages, and provided recommendations for further research. The chapter ended with an assessment of the achievement of the study's aims and the sufficiency of the answer to the research question.

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CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter addresses the strategic communication for EMS. The North West Province faces substantial issues in its healthcare delivery system. The primary objective of this study is to analyse the efficacy of strategic communication methods in EMS within the North West Province, emphasising their influence on response times, coordination, and patient outcomes. The literature review will address three essential sections: theoretical review, conceptual review, and empirical review. Each part analyses academic literature pertinent to the secondary objectives of this research. The theoretical review examines various frameworks and paradigms that promote successful communication in health emergencies. The conceptual review examines concepts and fundamental principles of strategic communication, especially in emergencies. The empirical review examines previous studies and data to demonstrate the impact of inadequate communication on EMS performance.

2.2 Theoretical Review

Boote and Beile (2005:4) highlight the importance of scholars comprehending previous work in the field. The obligation for researchers to cite prior studies relevant to their work underscores the scientific principle of cumulative research, which builds upon established knowledge, and the essential objectives that a literature review must achieve (Boote & Beile, 2005:4), namely:

- It sets the broad context of the study.
- It clearly demarcates what is and is not within the scope of the investigation.
- It situates existing literature in a broader scholarly and historical context.

Rocco and Plakhotnik (2009:121) concurred that theory is the foundation for literature reviews. Turner *et al*. (2018:34) assert that deficiencies in research occur when a hypothesis is selected at a given moment without regard for prior testing, verification, or falsification. These deficiencies result in a misleading or inadequate representation of the theoretical framework, impeding the research process's rigour (Turner *et al*., 2018:34). Connelly (2014:188) emphasises that when research outcomes deviate from expectations, two possibilities arise: either the research design or variable

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measurement was defective, or the theoretical framework guiding the research was incompatible with the context or population.

2.2.1 The Socio-Ecological Model (SEM)

Initially formulated by Urie Bronfenbrenner, the SEM offers an extensive framework for comprehending human growth and health behaviour (Kilanowski, 2017:295). The SEM is an extensive framework highlighting the intricate interactions between human behaviours and the diverse environmental influences affecting health and well-being. At its core, SEM delineates four primary levels of influence: the individual level, which includes human characteristics such as knowledge, attitudes, and talents; the microsystem level, which includes relationships with family, peers, and other intimate social networks; the mesosystem level, It illustrates the relationships among several microsystems; and the ecosystems level, which involves broader social systems that indirectly influence an individual's life, such as community resources and policies (Sell, Brandes, Brandes, Zeeb, Busse 2024; Hu, Zhou, Crowley-McHattan, & Liu 2021). This multi-tiered approach facilitates a detailed comprehension of the interactions among numerous elements that influence health outcomes.

Within the realm of EMS and strategic communication, the SEM provides significant insights into the diverse elements affecting communication practices and results (Townsend & Foster, 2013:1101-1103). At the individual level, knowledge, attitudes, and perceptions about EMS services can affect communication patterns and emergency responses. Community dynamics, encompassing social norms and cultural perspectives on health and emergency response, function at the interpersonal and community tiers of the SEM, influencing communication pathways and access to EMS resources. Institutional variables, including EMS protocols, training programmes, and organisational culture, are essential for promoting successful communication among EMS teams and external stakeholders, such as patients and community members (Ma *et al*., 2017:2430). Ultimately, policy-level considerations, including governmental laws and funding distributions for EMS, affect the overarching framework for formulating and executing communication strategies.

Due to its multifaceted structure, the SEM will help comprehend the strategic communication of the EMS in the North West Province, where the topic of communication permeates interconnected layers across multiple levels. Employing

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SEM within EMS emergency communication would facilitate examining how various constituents at several levels influence the efficacy and obstacles of communication during emergencies.

2.2.1.1 Individual Level

This level pertains to the individual traits of those involved in EMS: the EMS personnel, the patients, and the community members. The medical processes understood by EMS personnel in Northwest Province, along with their attitudes towards communication and familiarity with local languages or dialects, primarily influence their interactions with patients and the broader community. Furthermore, a patient's understanding of EMS services, attitude toward emergency care, and willingness to engage with medical workers may influence communication throughout the crisis.

2.2.1.2 Interpersonal and Community Levels

At this level, communication is influenced by social conventions, cultural values, and interpersonal relationships within the community. The norms in the North West Province either facilitate or impede the utilisation of EMS, contingent upon individuals' trust in the services or their acquaintance with them. Certain communities may maintain ideas around health, emergency, or traditional healing that influence their perception and utilisation of EMS. Establishing communication channels between the EMS and the community is governed by conventions, whether by word of mouth or local media outlets.

The institutional level evaluates the organisational frameworks that regulate internal and external communications within the EMS teams. In the North West Province, training rules, organisational management frameworks, and the overarching culture of EMS services will likely influence communication among EMS teams. Efficient information dissemination during an emergency necessitates unambiguous communication routes, suitable training in communication, and adherence to established EMS standards.

2.2.1.3 Policy Level

Greater regulatory and policy frameworks influence the communication strategy at this level. In the North West Province, government legislation, funding, and policies related to EMS directly determine the resources available for communication, including

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technology and personnel. From this perspective, policies that will provide adequate funding for the service of the EMS operation, particularly in rural areas, can significantly enhance communication, while an underfunded system might generate problems such as inadequacy of the communication infrastructure or understaffing of the EMS.

The SEM is a framework that illustrates the intricate links between individual behaviours and the broader social and environmental contexts in which they operate. Studies demonstrate that social support can encourage individuals to pursue help during emergencies, while the stigma associated with some health conditions can deter them from accessing vital services (Hayward, Vanqa, Makanda, Tisile, Ngwatyu, Foster, Mcinziba, Biewer, Mbuyamba, Galloway & Bunyula, 2024). This approach emphasises that health outcomes are influenced by numerous factors across different levels, including individual, interpersonal, organisational, community, and policy levels. The SEM suggests that substantial improvements in EMS delivery necessitate interventions at this level, including training programs that strengthen the skills of EMS personnel in handling diverse populations and complex situations (Amu, Adjei, Dowou & Bain, 2022:2). This discussion underscores the imperative for EMS providers to engage with communities to foster environments encouraging individuals to utilise emergency services when necessary. Partnerships between EMS and community organisations can enhance service delivery by equipping emergency responders with cultural competence and awareness of the distinct requirements of their communities (Dentoni, Pinkse & Lubberink, 2020:1218).

2.2.2 Six Building Blocks of Health Systems According to the WHO

The 2030 Agenda for Sustainable Development, endorsed by the United Nations in 2015, centres on 17 Sustainable Development Goals (SDGs). These SDGs serve as a framework for ensuring peace and prosperity for humanity and the planet, both presently and in the future. One of these objectives is SDG3, the goal of Good Health and Well-being, which guarantees healthy lifestyles and fosters well-being for individuals of all ages. Advancements in the execution of SDG3 are assessed based on objectives aimed at decreasing mortality and morbidity via public health initiatives and the fortification of health systems (Bickenbach *et al*., 2023).

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Foundations for a robust health system must be established during “normal” periods and across all health system sectors. Effective response plans must be devised in anticipation of shock. A crucial lesson from the COVID-19 pandemic is that the contextual characteristics of societies and subgroups significantly influence health systems’ capacity to withstand shocks, affecting the execution and efficacy of crisis management programs (Reiss *et al*., 2024).

A health system encompasses all organisations, individuals, and activities designed to promote, restore, or sustain health (reference). A WHO framework delineates the functions of a health system as six interrelated components vital to its operation. The components must collaborate to address evolving health requirements to enhance health (Fridell *et al*., 2020:6).

The WHO’s Six building blocks include:

- Health Workforce: A healthy workforce that is responsible, competent, and responsive to community needs.
- Service Delivery: Making healthcare available for all.
- Health Information Systems: Refers to the critical, reliable information and data systems that monitor and evaluate data.
- Health system financing: Equitable and sustainable financing for models to support healthcare systems.
- Leadership And Governance: Accountability in healthcare systems by effective governance and leadership.
- Medical Products: Accessibility to essential drugs and technology.

EMS should require adaptable and sustainable model systems incorporating standardised procedures, training, and low-risk results to meet community demands (Sommer *et al*., 2022). Patients with uncomplicated or complex conditions or injuries seek pre-hospital care worldwide. A historical review of EMS human resources reveals an increasing demand for a well-distributed workforce adept at meeting the varied healthcare requirements of the population (Tiwari *et al*., 2021:3). The public sector EMS is chiefly governed by the National Department of Health, which offers oversight

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and policy direction to provincial entities (Tiwari *et al*., 2021:3). The allocation of EMS personnel is frequently inequitable, resulting in inconsistencies in service provision, especially in rural and underprivileged urban regions (Tiwari *et al*., 2021:3). Expertise, proficiency, and discernment are essential for high-quality emergency medical treatment.

Superior EMS and first responders are critical components of every healthcare system. Research on pre-hospital services prioritises human factors, efficiency, and the ongoing enhancement of practice standards.

2.3 Conceptual Review

The conceptual framework provides numerous advantages to a study (Adom *et al*., 2018:439). It aids the researcher in recognising and formulating their perspective on the topic under investigation (Grant & Osanloo, 2014:12) and is also the most straightforward method by which a researcher proposes solutions to the identified problem (Liehr & Smith, 1999). This framework highlights the significance of a research issue, the researcher's assumptions, the scholars with whom they concur or dissent, and the intellectual foundation of their methodology (Evans, 2007:212).

2.3.1 Framework of Strategic Communication

Strategic communication in EMS entails deliberate and systematic dissemination of information to enhance the efficiency and effectiveness of emergency healthcare provision. The approach involves a comprehensive strategy for organising, implementing, and evaluating communication initiatives to ensure effective coordination and swift response to medical emergencies (Zerfass *et al*., 2020:158). In the realm of EMS, strategic communication involves more than merely conveying information to stakeholders such as healthcare professionals, emergency responders, and the public. It necessitates fostering collaboration and cultivating mutual understanding among these diverse groups (Nothhaft *et al*., 2018:354).

Strategic communication in EMS encompasses various interrelated elements that enhance the functionality of the emergency healthcare system (Zerfass *et al*., 2020:158). The elements included in this context comprise but are not limited to, the following: prompt and transparent dissemination of emergency information to the public; effective collaboration between EMS personnel and other healthcare providers;

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development and implementation of communication protocols specific to various emergencies; and continuous monitoring and evaluation of communication strategies to identify areas needing improvement (Nothhaft *et al*., 2020:30). In EMS, strategic communication necessitates a proactive stance on crisis communication, facilitating prompt responses and effective management of emergencies (Holtzhausen & Zerfass, 2014:76).

Strategic communication in healthcare environments is grounded in theoretical principles from various disciplines, including communication theory, organisational theory, and public health theory (Falkheimer & Heide, 2018:89). The Diffusion of Innovations Theory and Social Cognitive Theory provides significant insights into the dissemination and adoption of new communication approaches within healthcare organisations (Balconi, 2010:160). Organisational theories offer conceptual frameworks for understanding EMS agencies' communication structures and dynamics. They underscore the need for effective leadership and collaboration in achieving organisational goals (Berger, 2013:143). Moreover, strategic communication techniques aimed at fostering health behaviour modification and improving public health results are guided by public health theories (Higgins, 2022:360). By integrating these theoretical perspectives, EMS organisations may develop effective communication strategies that address emergency healthcare delivery's specific challenges and needs.

2.3.2 Foundations of Strategic Communication in EMS

Strategic communication is a crucial component of EMS, involving the planning, execution, and assessment of communication strategies to fulfil organisational goals and objectives during emergencies (Andersson *et al*., 2020). In the realm of EMS, strategic communication entails the organised dissemination of information among EMS personnel, dispatch centres, healthcare professionals, and other stakeholders to enable prompt and coordinated response initiatives. Jacobson *et al*. (2021:28) assert that strategic communication in EMS seeks to guarantee clarity, consistency, and accuracy in disseminating critical information, including incident specifics, patient condition, and resource availability, to facilitate effective decision-making and resource distribution. By implementing explicit communication protocols and utilising diverse communication channels, EMS organisations can improve situational

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awareness, refine operational processes, and optimise resource allocation to provide timely and suitable care for needy patients (Gausche-Hill *et al*., 2021:91).

2.3.3 Strategic Communication in an Emergency Situation

Strategic communication is the planning, implementation, and assessment of communication strategies to attain specified goals within an organisational or operational framework (Werder *et al*., 2020:19). The process entails the prompt and efficient dissemination of information among emergency responders and governmental bodies, media organisations, and impacted populations to guarantee a synchronised and unified response (Winkler & Etter, 2018:382).

Strategic communication is an intricate discipline that aims to deliver precise and trustworthy information to the community, functioning as an essential tool for alleviating panic and confusion during crises. Alongside these core objectives, strategic communication aims to promote collaboration among diverse stakeholders, which is crucial for tackling the intricate issues that emerge during a crisis (Werder *et al*., 2020:19). This field focuses not only on information distribution but also on the broader goal of optimising resource mobilisation efficiently and effectively.

Winkler and Etter (2018:382) examined the increasingly acknowledged concept that strategic communication is not merely a deliberate process but also arises naturally in reaction to evolving contextual elements. They address the conceptual and methodological challenges of emergence, suggesting a dual narrative framework. This framework clarifies both the process (strategising) and the product (strategised communication) of strategic communication as narrative constructs (Winkler & Etter, 2018:388) and differentiates between prior forms of emergence. These include the impact of strategic trends and peripheral strategising on strategic communication and subsequent forms of emergence, which pertain to the attribution and reframing of strategy during the communication process (Merchant *et al*., 2021:223). Their contribution enhances the discourse on strategic communication by offering a framework that incorporates the concept of emergence without relying on tautological explanations. Doing so deepens our comprehension of the dynamic characteristics of strategic communication processes.

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2.3.4 Role of Communication in Healthcare Service Delivery

Effective communication is essential for delivering timely and appropriate healthcare services. It significantly contributes to collaboration among healthcare practitioners and guarantees the seamless coordination of patient care.

The WHO (2020) emphasises that effective and concise communication among healthcare professionals, patients, and caregivers is crucial for precise diagnosis, treatment planning, and drug administration. In the realm of EMS, effective communication channels facilitate swift responses to medical situations, diminishing patient morbidity and death rates (Bennett *et al*., 2020:695). Furthermore, effective communication cultivates patient satisfaction and trust in the healthcare system, improving healthcare service delivery and patient outcomes (Merchant *et al*., 2021:223).

Inadequate communication within healthcare environments can adversely affect patient outcomes and the efficiency of the healthcare system. Research conducted by Frydenberg and Brekke (2012) and Patiño *et al*. (2022) identified communication failures as a primary factor in adverse events within healthcare, leading to medication errors, treatment delays, and avoidable patient harm. Studies demonstrate a deficiency of standardised methods for the management of medical errors in public-sector EMS (Rowland & Adefuye, 2021). Creating a safety culture and executing quality improvement activities are crucial for augmenting the dependability of EMS operations (Christopher, 2023). The South African EMS landscape is characterised by inconsistencies in governance and administration, which might hinder efforts to enhance service delivery (Christopher, 2023). Quality systems in EMS are nascent, necessitating thorough evaluations to pinpoint areas for enhancement (Howard *et al*., 2020:4). Inadequate communication can result in misunderstandings, conflicts, and inefficiencies within healthcare teams, undermining the quality and efficacy of patient care delivery (King et al., 2013:1100).

2.4 Empirical Review

The empirical review in research entails the systematic analysis of empirical studies to assess the methodologies, findings, and implications of research across diverse domains, including social-environmental sciences, sustainable development (Kimmich *et al*., 2023), management information systems (Wang & Luo, 2020), legal research

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(Van Boom *et al*., 2018), and studies involving Indigenous Arctic populations (Van Boom *et al*., 2018). This approach seeks to discern patterns, deficiencies, and exemplary practices within the research, enhancing knowledge and refining future investigations (Adom *et al*., 2018:439).

Researchers evaluate the quality of empirical studies, investigate various research phenomena, and identify topics for additional inquiry using meta-analyses, systematic reviews, and scoping reviews (Adom *et al*., 2018:439). By integrating numerous techniques, procedures, and outcomes, empirical reviews in action research are essential in guiding academic inquiry and fostering evidence-based decision-making across several disciplines.

2.4.1 Global Perspectives on Strategic Communication in EMS

An analysis of global research on strategic communication techniques in EMS uncovers diverse methodologies and experiences throughout distinct healthcare systems. The psychological well-being of EMS professionals is essential, as their mental health directly affects the quality of care they deliver. The significant anxiety levels revealed by these personnel underscore the necessity for mental health support mechanisms within EMS frameworks to maintain their resilience and efficacy during emergencies (Ramlagan, Sewpaul, Shean, Schmidt, North & Reddy, 2024:2). The COVID-19 epidemic required swift modifications in EMS policies and practices. In South Africa, EMS had to adapt to these changes while maintaining necessary services for non-COVID situations, which were frequently deprioritised during the pandemic (Nyasulu & Pandya, 2020). Moreover, Merchant *et al*.'s (2021:224) meta-analysis indicates that inter-agency collaboration and information sharing are critical for effective communication methods in EMS. Strategic communication is crucial for optimising EMS performance and improving patient care delivery.

An in-depth analysis of international research on strategic communication in EMS reveals supplementary case examples that provide significant insights into optimal practices and obstacles. Japan's reaction to the Fukushima nuclear crisis exemplified the essential function of excellent communication in orchestrating emergency response initiatives and alleviating public health hazards. Research conducted by Tsujiguchi *et al*. (2020) underscores the need for prompt and precise information broadcast to mitigate public apprehensions and facilitate evacuation protocols during

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nuclear emergencies. Likewise, the World Trade Centre (WTC) event on September 11, 2001, illustrated the necessity for synchronised communication across various authorities and parties in addressing intricate catastrophes. Research conducted by Nagashima and Yasuda (2021) and Tatsuzaki *et al*. (2022) underscores the significance of interoperable communication systems and collaborative command frameworks in enhancing information exchange and decision-making during large-scale catastrophes.

Furthermore, the reactions to numerous global earthquakes have imparted significant insights into strategic communication for EMS. The 2010 earthquake in Haiti highlighted the difficulties of coordinating international humanitarian aid and connecting with impacted communities in resource-limited environments. Research conducted by Arnaouti *et al*. (2022) underscores the necessity for culturally responsive communication techniques and community participation to enhance the efficacy of emergency response initiatives in many contexts. The 2011 earthquake and tsunami in Tohoku, Japan, significantly improved disaster communication infrastructure and coordination systems. Research by Salam and Khan (2020:1473) and Kroll *et al*. (2021:87) emphasises the significance of technology-driven communication platforms and public education initiatives in improving disaster preparedness and resilience. These case studies provide significant insights into the intricacies of strategic communication in EMS and highlight the necessity of context-specific strategies for addressing communication obstacles during emergencies.

The health system in Yemen has faced continuous pressure due to extended conflict and political instability, significantly impairing its ability to provide vital medical care. Since the conflict escalated in 2014, the extensive devastation of infrastructure, particularly healthcare institutions, has worsened an already precarious system. According to the WHO, only 54% of health facilities are fully operational, while the rest are either partially operational or non-operational due to damage, insufficient supplies, and workforce deficiencies (WHO, 2020). The healthcare system in Yemen functions under a decentralised framework with three administrative tiers: central, governorate, and district. The execution of this decentralisation has encountered difficulties, especially in the context of the ongoing conflict (Al Waziza *et al*., 2023). The Ministry of Public Health and Population (MOPHP) is responsible for the development of

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comprehensive policies and strategies. Local governance systems at the governorate and district levels continue to face challenges in resource allocation and service delivery due to insufficient budgets and organisational inefficiencies (Al Waziza *et al*., 2023). Dependence on external assistance continues to pose a significant challenge, as financial limitations critically hinder the capacity to maintain health services independently (WHO, 2022).

The shortage of healthcare professionals is a significant concern, exacerbated by the emigration of trained people from conflict areas and the nation (WHO, 2020). This deficiency affects service provision universally, ranging from primary healthcare to specialised medical services. The Al Hodeida governorate, significantly impacted by the conflict, has succeeded in delivering limited healthcare services and achieving modest progress in outbreak management, primarily through collaborations with non-governmental organisations (NGOs) (Al Waziza *et al*., 2023). Notwithstanding these initiatives, the health workforce remains insufficient, adversely impacting the overall quality and accessibility of care (WHO, 2020). Effective governance and leadership are essential for the resilience of the health system. The decentralised decision-making framework in Yemen enables governorate health offices to oversee and administer district health offices (Al Waziza *et al*., 2023). Nonetheless, the conflict has undermined these frameworks, resulting in erratic execution of health policies and plans. Sources in Al Hodeida indicate that although local authorities and health officials predominantly make choices, substantial issues are sent to higher authorities, frequently postponing essential treatments (Al Waziza *et al*., 2023). Despite the limitations, considerable achievements have been realised in disease management and primary healthcare services. Al Hodeida has experienced advancements in managing outbreaks, owing to collaborative efforts between local health authorities and international partners (Al Waziza *et al*., 2023). These accomplishments are eclipsed by overarching structural deficiencies that impede sustainable advancement.

2.4.2 Regional Perspectives on Strategic Communication in EMS

An analysis of studies on strategic communication in EMS in Africa uncovers many obstacles and opportunities, as evidenced by multiple case studies. The reaction to Cyclone Idai in Mozambique in 2019 underscored the essential function of strategic communication in coordinating EMS under extensive destruction. It is necessary to

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identify the challenges EMS personnel face in reaching affected communities in remote areas and enabling efficient contact with humanitarian aid organisations (Chanza *et al*., 2020:655). The research underscores the need for resilient communication infrastructure and interoperable technologies to respond promptly and distribute resources during natural disasters.

In Zimbabwe, catastrophic traffic accidents, such as the incident on the Harare-Mutare highway in 2018, underscore the critical need for effective communication in coordinating emergency response efforts and delivering prompt medical help to victims. Nhamo and Chikodzi (2021:187) identify the communication obstacles EMS personnel encounter in reaching accident sites and coordinating with hospital staff to facilitate efficient patient transfer and continuity of care. The study advocates for enhanced communication procedures and training for EMS professionals to increase coordination and efficiency in EMS delivery.

2.4.3 Local Perspectives on EMS - South Africa

2.4.3.1 Emergency Medical Service in Private Healthcare in South Africa

In the routine practice of emergency medicine, clinicians consistently engage with elements of EMS systems. Delivering superior care in the pre-hospital environment necessitates that emergency physicians stay informed on current literature that could influence patient management before they arrive at the emergency department (Degenaar *et al*., 2022:710). The private health sector recruits skilled and experienced professionals who utilise advanced technologies, a resource the public sector cannot provide due to financial limitations. Modern technology, including digital software used by the private sector, facilitates organised communication among the caller, contact centre, and attending paramedics during emergencies.

2.4.3.2 Emergency medical services in public healthcare in South Africa

The South African government offers emergency ambulance services across all nine provinces. Thus, under the prior arrangement during the apartheid era, all levels of EMS workers functioned as an extension of their Medical Director's medical practice license. The novel methodology provides ECT and ECP considerable independence in collaborative practice (Nodirovna et al., 2022:182). Established standing orders or

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protocols exist, necessitating consultation with physicians, irrespective of their qualifications.

The EMS workforce primarily consists of Basic Ambulance Assistants (BAAs) at 76%, followed by Advanced Emergency Assistants (AEAs) at 18%, and Advanced Life Support (ALS) practitioners at merely 3% (Tiwari *et al*., 2021:5). This distorted distribution signifies an absence of advanced training and experience among the EMS personnel, potentially affecting the quality of care delivered. The restricted availability of employment prospects within EMS exacerbates the issues confronting the healthcare system, as numerous talented persons may choose opportunities elsewhere, resulting in a brain drain in the sector (Tiwari *et al*., 2021:6).

Quality assurance in EMS is a vital component of the local viewpoint. Research indicates that quality systems in South African EMS remain underdeveloped, exhibiting considerable challenges concerning transparency, reliability, and contextual relevance (Howard *et al*., 2020:4). Inadequate communication and deficient leadership are frequently identified as prevalent issues that obstruct the advancement of effective quality systems (Howard et al., 2020). The absence of defined quality benchmarks and standards exacerbates challenges in enhancing service delivery and patient outcomes within the EMS framework (Christopher, 2023).

2.4.3.3 Staffing

The staffing of EMS in South Africa is a complex issue marked by substantial problems that affect the provision of emergency care. A significant problem in staffing EMS in South Africa is the elevated patient-to-provider ratio. Tiwari *et al*. (2021:6) indicate that healthcare personnel in South Africa express unfavourable views of the public health system, attributing their unhappiness and inclination to exit the sector to excessive patient loads, prolonged working hours, and insufficient resources. Sobuwa and Christopher (2019) emphasise the necessity for a professional cadre of emergency care providers proficient in providing effective pre-hospital treatment. The restricted availability of employment opportunities in EMS intensifies this problem, as numerous skilled persons struggle to secure positions in the area, resulting in a skills mismatch and underutilisation of available talent (Tiwari *et al*., 2021:6).

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The proliferation of training providers has led to a greater quantity of qualified workers, yet the quality and consistency of training continue to be inconsistent (Sobuwa & Christopher, 2019). Olatunji, Kokori, Aderinto, and Alsabri (2024:2) underscore the necessity of training proficient practitioners, especially in vital domains such as airway control, which is essential in resource-limited environments like South Africa. The absence of standardised training and certification protocols may result in inconsistencies in the competencies of EMS professionals, exacerbating staffing challenges.

2.4.3.4 Vehicles

The vehicles operated by EMS in South Africa exhibit considerable diversity. They vary in size from minuscule to as big and in style from contemporary to antiquated, sometimes determined by economic concerns. The environmental impact of EMS vehicles is a significant concern, especially regarding South Africa's dedication to decreasing carbon emissions. The transportation industry accounts for around 11% of the nation’s carbon dioxide emissions, with road transport providing nearly 90% of this figure (Ntuli, Eloka-Eboka, Mwangi, Ewim & Dioha, 2023:5). Mitigating these obstacles is crucial for improving the sustainability of EMS operations.

The incorporation of technology in EMS vehicles, including real-time communication systems and GPS navigation, has significantly augmented their operational efficiency, facilitating faster response times and increased patient care (Alshehri, Pigoga & Wallis, 2020:639). The COVID-19 pandemic has significantly affected EMS operations in South Africa. Research demonstrates that during the lockdown, there was a significant reduction in trauma-related ambulance transports, indicating alterations in injury patterns and access to healthcare resources (Pettke, Stassen, W., Laflamme, Wallis & Hasselberg, 2023:2). Notwithstanding these constraints, the EMS system exhibited resilience, sustaining constant response and on-scene times, which are essential for good emergency care delivery (Pettke *et al*., 2023:2).

2.4.3.5 Dispatch

Historically, EMS transmissions emanated from various sources and often involved self-dispatch, a practice still utilised by modern operational organisations. The use of technology in EMS dispatch systems can augment operational efficiency and boost patient outcomes. The implementation of telephone triage systems has been

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suggested to manage patient volumes after hours in primary healthcare facilities, thus reducing the burden on emergency rooms (Adeniji & Mabuza, 2018:219). These technology innovations can improve decision-making and optimise the dispatch process, ultimately resulting in superior patient care.

2.4.3.6 Time Response

In South Africa, EMS encounter substantial challenges related to response times, which are crucial for patient outcomes, especially in emergencies such as out-of-hospital cardiac arrests (OHCA). The average EMS response time in South Africa is significantly longer than in many developed nations, with studies revealing an average of approximately 26 minutes in Cape Town, in contrast to 6 minutes in Iran and 7 minutes in Sweden and Serbia (Stassen, Wylie, Djärv & Wallis, 2021:2). This disparity underscores systemic issues within the South African EMS framework, including resource limitations and infrastructural obstacles that hinder prompt medical intervention.

2.5 Chapter Summary

This chapter examined the strategic communication strategies in EMS and the critical elements of an effective emergency response system. It underscores the significance of comprehensive evaluation and strategic planning in communication methodologies to guarantee the effective coordination of superior emergency services. EMS providers can pinpoint deficiencies in their communication processes by conducting a thorough assessment and acquiring insights into the requirements and preferences of dispatch centres, field responders, and other stakeholders.

Choosing suitable communication technologies is essential for guaranteeing efficient and prompt emergency responses. Nonetheless, it is imperative to evaluate the financial ramifications of these decisions. By reconciling these factors and employing a multidisciplinary strategy, EMS providers may enhance resource distribution, foster sustainable communication methods, and guarantee equitable access to emergency services for all populations.

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Strategic communication management is essential for supervising the complete communication process, from ensuring a dependable information flow to sustaining the technology infrastructure. Emergency Medical Services can improve service delivery while optimising resource management by emphasising ethical and economic factors. Successful integration of new communication solutions into EMS operations necessitates a coordinated effort involving EMS personnel, healthcare institutions, and communication technology suppliers. The following secondary objectives (SO) were addressed in this chapter:

- SO-2: To assess how modern communication technologies, like digital dispatch systems, can be used to improve EMS coordination and operations within the province. The chapter assessed the significance of choosing suitable communication technologies for evaluating contemporary tools such as digital dispatch systems. It underscored the importance of comprehensive evaluation and strategising in implementing communication solutions that facilitate successful coordination among dispatch centres, field responders, and other stakeholders. The emphasis on optimising resource allocation and assessing technical solutions corresponds with analysing how contemporary technologies might enhance EMS coordination and expedite operations in the North West Province.
- SO-3: To examine avenues for augmenting communication tactics that may enhance the efficiency and responsiveness of EMS in the North West Province. The chapter examined deficiencies in existing communication methods and underscores the necessity of a multidisciplinary approach for enhancement. The necessity for a cooperative endeavour between EMS professionals and technology suppliers indicates methods to improve communication strategies. The emphasis on balancing ethical, economic, and technological factors underscores a commitment to enhancing communication strategies to increase efficiency and responsiveness. This directly pertains to discovering new methods to improve communication within the EMS system in the North West Province.

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This chapter offered insights into how the study has addressed secondary objectives by assessing communication technologies and examining strategies to improve the effectiveness of EMS operations. Chapter Three will clarify the research approach and methodology that support this study.

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CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

This chapter explored the research design and methodology, expanding the outline provided in Chapter One. This chapter outlined the methodical procedures employed to gather and analyse data, providing the validity and reliability of the research findings. A qualitative methodology was applied, using semi-structured interviews to gain insights into the strategic communication strategies of EMS in the North West Province. This chapter establishes a foundation for the subsequent research chapters and discusses ethical considerations to protect the integrity of the research process.

3.2 Empirical Investigation

Empirical research is a systematic approach to addressing specific inquiries through collecting information under well-specified and replicated conditions (Calfee & Chambliss, 2005:53). It encompasses qualitative and quantitative methodologies, highlighting the diverse approaches used to gather and analyse data systematically. The research design of an empirical inquiry involves the identification of the research paradigm, methodological approach, selection, research strategy, temporal framework, and data collecting and analysis methods (Venter & Van Eck, 2021:64).

3.3 Research Design

The research design encompasses the overarching plan and strategy employed to address the research questions and achieve the study's objectives (Mbanaso *et al*., 2023:67). It serves as a blueprint for conducting the investigation, outlining the methods, procedures, and techniques used to gather and analyse data (Pathiranage *et al*., 2020:361). Research design is a framework that links theoretical research challenges with practical and concrete empirical findings (Van Wyk, 2012).

Qualitative descriptive studies entail a clear, complete account of an event or experience, closely reflecting the participants' views. This study approach delineates phenomena with minimal interpretation or abstraction, rendering it particularly appropriate for investigations to obtain practical and real-world insights into difficulties. As noted by Sandelowski (2000:339), this methodology provides a contextual understanding of the "who, what, and where" of occurrences.

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It effectively conveys participants' perspectives in a clear and accessible manner, facilitating comprehension of specific activities without necessitating extensive theoretical frameworks. Studies on health-related matters within particular social, cultural, economic, ecological, and political contexts often use interviews as the primary research method (Barbour, 2005:750). This approach underscores participant engagement and enables data generation through a well-defined methodology focused on the topic (Wong, 2008:256). In this study, the research methodology enabled a versatile analysis of participants' perspectives, experiences, and concepts of EMS communication tactics.

An inductive methodology, commonly linked to the interpretive epistemological framework, was employed in this study. Kuczynski and Daly (2003:373) assert that the researcher intentionally organises and assigns meaning to the data to develop higher-order categories and theories in interpretive induction. The inductive method facilitates the application of interpretivism notions through textual evidence, leading to the study's primary conclusions via bottom-up reasoning (Kuczynski & Daly, 2003:373). Through purposive sampling, participants were selected based on their knowledge and involvement in EMS communication processes, ensuring diverse and comprehensive data collection. Data analysis involved thematic coding and interpretation, allowing for the identification of common themes, patterns, and discrepancies across participants' responses. Thematic analyses transcend the enumeration of explicit words or phrases, concentrating instead on the identification and articulation of both implicit and explicit concepts within the data, namely, themes (Guest *et al*., 2012:2). This research design facilitated a holistic understanding of the challenges and opportunities in EMS communication, formulating informed recommendations for improvement.

3.4 Methodological Choice

Densin and Lincoln (2005:2) stated: "*Qualitative research is multimethod in focus, involving an interpretative, naturalistic approach to its subject matter. This means that qualitative researchers study things in their natural settings, attempting to make sense of or interpret phenomena in terms of the meanings people bring to them. Qualitative research involves using and collecting various empirical materials – case studies, personal experiences, introspection, life stories, interviews, observational, historical,*

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interactional, and visual texts – that describe routine and problematic moments and meanings in individuals' lives."

The study used a qualitative research approach to analyse the strategic communication methods in EMS and the essential components of an effective emergency response system. Qualitative research, as noted by Saikia (2024), emphasises the subjective experiences of humans, investigating profound issues and uncovering the complex meanings that individuals attribute to their experiences, interactions, and environments. Qualitative research is associated with the interpretivism research paradigm, emphasising a small sample's subjective perspectives and beliefs (Wiid & Diggines, 2013:87). A qualitative method enables participants to express their subjective thoughts and perspectives without bias while permitting the researcher to explore further without external interference. It facilitates a thorough examination and depiction of the intricacies and variances of the studied worlds (Philip, 1998:267). According to Sofaer (1999:1104), qualitative methods also facilitate constructing or developing theories or conceptual frameworks and generate premises.

3.5 Research Paradigm

All research is inherently biased; every study is based on underlying assumptions about the world and knowledge that shape the investigations (Creswell & Clark, 2017). Collis and Hussey (2014) characterise a research paradigm as grounded in individuals' ideologies and preconceptions regarding the universe, consequently shaping their research methodologies. This research followed an epistemological framework, allowing the researcher to explore the essence of knowledge and analyse the scope, methods, and distinctions between belief and opinion regarding truth. The paradigm is essential for this study because it provides a perspective that acknowledges the role of human thought processes and the particularities of scientific domains (MacLeod 2018:697) in shaping the nature and structure of knowledge (Boon, 2011:71).

3.6 Population and Sampling

Burns and Grove (2005:40) describe a population as the entirety of items (individuals, things, or substances) that satisfy particular criteria for inclusion in research. Sampling denotes the procedure of choosing a subset of individuals or items from a broader

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population for research purposes (Siedlecki, 2020:12). The process entails making strategic choices about participant selection to guarantee that the sample accurately represents the target population (Gill, 2020:579-581). Purposive sampling, or judgemental or selective sampling, entails intentionally selecting participants with particular features or experiences pertinent to the research questions (Stratton, 2021:373). This selection strategy enables researchers to choose individuals capable of offering substantial and meaningful data relevant to the study objectives instead of randomly picking participants (Rahman, 2023:60).

Numerous stakeholders, such as EMS personnel, dispatchers, and healthcare practitioners, were recognised as essential participants owing to their direct engagement or expertise in EMS communication procedures. Criteria, including their role within the EMS system, years of experience, and geographic location, were utilised to guarantee the inclusion of participants with diverse viewpoints and skills during the sampling process (Johnson *et al*., 2017:9).

Potential participants were approached through professional networks, EMS organisations, and healthcare facilities. Individuals who met the criteria and expressed willingness to participate were invited to the study, and semi-structured interviews were conducted. Maximum variation sampling is beneficial when studying complex phenomena where differences in experiences may be highly beneficial (Suri, 2011:67-69). The sampling involved maximum variation, emphasising diversity and inclusivity to capture wide-ranging perspectives and experiences related to communication issues in EMS. This approach ensured that key patterns and unique variations were represented in the data by including participants from different backgrounds and roles.

3.7 Inclusion and Exclusion

The inclusion and exclusion criteria establish the possible participant pool and significantly influence the study's feasibility (Hornberger & Rangu, 2020). An excessively restrictive criterion may result in inadequate sample size and insufficient data, whereas an overly broad criterion could introduce extraneous variables that adversely affect the research aims (Hornberger & Rangu, 2020).

Patiño and Ferreira (2018:84) characterise inclusion criteria as the essential attributes of the target population the researcher would employ to address the research

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questions. The criteria often encompass demographic, clinical, and geographic variables (Patiño & Ferreira, 2018:84). Hornberger and Rangu (2020) define exclusion criteria as characteristics or external circumstances pertaining to an individual that conflict with or obstruct the objectives of the investigation. Patiño and Ferreira (2018:84) assert that exclusion criteria are attributes of prospective study participants who meet the inclusion criteria but possess extra qualities that may compromise the study's efficacy or elevate their risk for an adverse outcome.

The study analysed communication practices, technology, and challenges in EMS operations in the North West Province, highlighting the understanding of internal and external communication dynamics. It emphasised how effective communication strategies can improve emergency response services and identified critical areas for enhancement to serve the provincial population better. The sector relates to EMS in Public Health; therefore, it is essential to clearly define and separate the study areas to ensure geographical precision. The focus of this study is the North West Province in South Africa.

3.7.1 Inclusions for the Study

- This study examines communication approaches within EMS, emphasising the interactions of EMS teams internally (among EMS units) and externally (with hospitals, dispatch centres, and other emergency response entities) in the North West Province.
- The study evaluates the impact of communication technology in EMS operations, including radios, dispatch systems, and mobile data terminals, to assess their effectiveness and limitations in emergency response scenarios.
- The study examines particular communication obstacles encountered by EMS professionals in the North West Province, including geographical barriers, network problems, and coordination hurdles, to pinpoint essential areas for enhancement.
- The study examines the impact of EMS communication techniques on public health outcomes and emergency response within the broader public healthcare industry.

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- The study concentrates solely on EMS operations in the North West Province, analysing local communication dynamics and particular issues pertinent to this region.

3.7.2 Exclusions for the Study

- The study exclusively investigates EMS communication methods within the North West Province, excluding other South African provinces and EMS systems.
- Communication methods pertaining to other public health sectors, including non-emergency services, general healthcare administration, or outpatient services, will be excluded to ensure a concentration on EMS.
- Communication-related operational issues, such as equipment shortages, staffing, or vehicle maintenance, will only be addressed if they directly affect communication effectiveness.
- The study will exclude individual patient cases and specific emergencies, concentrating on strategic communication strategies rather than patient outcomes or unique emergencies.

3.8 Data Collection Method

A single study may employ diverse data collection strategies, incorporating primary and secondary sources (Kumar, 2018). Given its qualitative nature, the study utilised primary and secondary data to achieve its objectives. Ajayi (2017:3) characterises primary data as material gathered directly by the researcher using surveys, observations, questionnaires, and interviews, while secondary data refers to information collected by third parties for diverse objectives at varied intervals.

Hox and Boeije (2005:594) state that the secondary data originates from a prior study, and each study endeavours to address a distinct set of research questions. During the secondary data collection, choices are made regarding the selection of information, sampling methodology, and the data-gathering process (Hox & Boeije, 2005:594).

An interview guide, semi-structured in nature, was created to gather data, as detailed in Appendix A. An interview guide is an arrangement of questions and themes that provides a framework for a semi-structured interview (Ahmadin, 2022:110). The guide ensured uniformity throughout the interviews. Semi-structured interviews served as the principal strategy for data gathering in this study. Pajo (2022:18) describes a semi-

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structured interview as a qualitative data-collecting technique that entails formulating open-ended questions to guide the conversation. It allows flexibility to pose follow-up questions and delve deeper into details based on participant's replies. Open-ended questions enable participants to articulate their responses in their own words instead of selecting from predetermined possibilities (Ahmadin, 2022:109).

Thorough preparation is crucial for structured interviews, identifying question types aligned with the overarching research project (Newcomer *et al*., 2015). Semi-structured interviews were administered to participants. According to Adam (2013:493), this strategy employs a conversational approach with individual respondents, integrating closed and open-ended questions, frequently accompanied by probing inquiries. The interviews, conducted in English and lasting 30 to 45 minutes, aimed to clarify the study's topic and mitigate potential translation problems. Follow-up questions were raised spontaneously from the interview dynamics (Adeoye-Olatunde & Olenik, 2021:1358).

Individual interviews were performed to facilitate participants' open sharing of their perspectives. Sessions took place in private rooms, with only the researcher and participant present to ensure confidentiality. The researcher then converted audio recordings into text, capturing the exact words spoken during the interviews to produce a precise record of the interview material (Pajo, 2022:12).

Participants were notified that they could excuse themselves from answering uncomfortable questions or withdraw from the study without consequences. The study delineated methods to safeguard confidentiality, such as de-identifying transcripts and using participant codes like Participant One or Participant Two.

3.9 Rigour

Researchers assert that the rigour of qualitative research is equivalent to its reliability and validity, making them essential components of quality (Cypress, 2017:254). Trustworthiness is the principal criterion for evaluating qualitative research quality (Ghafouri & Ofoghi, 2016:1914), while reliability and validity are viewed as fundamental criteria for quality in quantitative research paradigms (Golafshani, 2003:601). Qualitative research prioritises trustworthiness to guarantee quality and credibility (Brink *et al*., 2018:157). The researcher utilised diverse methodologies to

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oversee and assess the research's reliability and validity, ensuring the findings' credibility. This encompassed guaranteeing impartiality and confirmability, analysing similarities and disparities in the transcript, upholding rigorous documentation, and soliciting participant authentication for the interview transcripts (Brink *et al*., 2018:157).

Using Lincoln and Guba's (1985) criteria for trustworthiness, the researcher inquired, "*How can I effectively communicate the importance of my research findings to my audience and encourage their consideration?"* In answering this pivotal question, the researcher articulated the four criteria: credibility, dependability, transferability, and confirmability. Lincoln and Guba (1985) present these requirements as fundamental principles for ensuring the quality and validity of qualitative research, articulated as a fifth criterion for trustworthiness.

3.9.1 Credibility

Credibility denotes the extent of integrity of the results in a qualitative theory-building study (Guba, 1981:76). It evaluates the accuracy and legitimacy of the study's findings. Credibility, as articulated by Lincoln and Guba (1985), denotes the degree to which study findings faithfully represent the participants' original data and effectively communicate their views. The findings of this study established credibility through the use of rigorous methodologies, which included semi-structured interviews, ethical considerations, and the validation of results by participants.

3.9.2 Dependability

Dependability, as articulated by Lincoln and Guba (1985), pertains to the evaluation conducted by participants concerning the credibility of the research results, interpretations, and recommendations; this evaluation is grounded in the data supplied by the participants. Dependability refers to the accuracy and trustworthiness of data over time. The study offered an overview of the qualitative methodology, outlining the data analysis and subject investigation approaches.

3.9.3 Transferability

Lincoln and Guba (1985) define transferability as the degree to which qualitative research findings can be utilised in other contexts or environments with various participants. This pertains to the applicability of the findings across diverse situations or environments. Offering specific details regarding the conditions under which the

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findings were derived, along with a comprehensive description of the research setting, allows the audience to evaluate the relevance of the insights.

3.9.4 Confirmability

Lincoln and Guba (1985) describe confirmability as the guarantee that the facts and interpretations of findings are grounded in the data rather than being subjective or fictitious. It indicates the degree to which the respondents influence the conclusions rather than the researcher's biases, motivations, or personal interests. The document outlined a detailed procedure for participant validation and emphasised adherence to ethical norms during the research process. This methodology guaranteed that the findings precisely represented the participants' reactions and viewpoints without any influence from the researcher's prejudices.

3.9.5 Triangulation

Carter *et al*. (2014: 545) assert that triangulation is a qualitative research methodology designed to augment validity by integrating data from many sources. In this study, the researcher utilised triangulation to validate the precision and comprehensiveness of the data and its interpretation via cross-referencing. Triangulation in qualitative research employs many approaches or data sources to thoroughly comprehend phenomena (Patton, 1999). This study included primary responses from essential participants in improving communication within the EMS system.

3.10 Data Analysis

Data analysis involves examining, cleansing, transforming, and interpreting raw data to extract significant insights and formulate conclusions pertinent to the research objectives (Mezmir, 2020:27). It entails systematic methodologies and approaches for structuring and interpreting the data gathered throughout the research project.

3.10.1 Thematic Analysis

A thematic analysis was used for its efficacy in detecting, analysing, and reporting themes within data (Braun & Clarke, 2012:58). Vaismoradi *et al.* (2013:398) assert that thematic analysis can identify and analyse the shared perspectives of participants. Thematic analysis was utilised to examine the material collected from semi-structured interviews (Sandelowski, 2000:340). Thematic analysis is a versatile and prevalent methodology that recognises patterns, themes, and repeating concepts within

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qualitative data (Braun & Clarke, 2012:57-62). This approach enables researchers to methodically classify and analyse the varied narratives offered by participants, yielding a thorough comprehension of the phenomena being studied (Jackson & Bazeley, 2019:29-34).

Through an iterative coding and theme development process, the researcher refined and revised the themes until they achieved a coherent and comprehensive analysis. (Cresswell, 2013:29). The analysis process began with familiarisation, where the researcher immersed themself in the data by reading and re-reading transcripts to gain a deep understanding of the content. Next, initial codes were generated by systematically labelling and categorising data segments relevant to the research questions. These codes were then organised into broader themes, which captured common patterns or concepts emerging from the data. Finally, the themes were interpreted and contextualised within the wider theoretical framework, allowing for meaningful insights and conclusions regarding strategic communication practices within EMS in the North West Province. The thematic analysis provided a structured and rigorous approach to analysing qualitative data, enabling the study to uncover key findings and implications relevant to the research objectives.

The research was performed inductively, with data coded absent a pre-established framework (Nowell *et al*., 2017). To ensure anonymity, each participant was designated a code, such as Participant One or Participant Two, and the interviews were documented verbatim before the data was analysed qualitatively. The thematic analysis comprised six phases (Braun & Clarke, 2006):

- Familiarising Yourself with Your Data: The researcher carefully examined the data, reviewing transcripts, examining fieldnotes, and listening to responses to guarantee correct transcription (Nowell *et al*., 2017).

- Generating Initial Codes: Keywords were determined based on respondents' words and the study's objectives (Nowell *et al*., 2017).

- Searching for Themes: The researcher discerned analogous codes substantiated by direct participant quotations. Associated sub-themes were classified, enhancing the primary themes. Themes were organised according to participant replies (Nowell *et al*., 2017).

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- Reviewing Themes: A subsequent meeting was conducted with the supervisor to verify the topics' suitability and methodological rigour (Nowell *et al*., 2017).
- Defining and Naming Themes: Phase Three activities were reviewed. Codes were established and represented by thematic matrices (Nowell *et al*., 2017).
- Producing the Report: The report was compiled according to the research objectives, and the findings are delineated in Chapter Four (Nowell *et al*., 2017).

3.11 Ethical consideration

Ethical considerations in research refer to the principles and guidelines that protect participants' rights, well-being, and confidentiality throughout the research process (Suri, 2020:41-54). These considerations are essential for upholding the integrity and trustworthiness of the research and safeguarding participants' dignity and autonomy.

This study complied with the requisite ethical standards. Ethics clearance was secured from the Faculty of Economic Management Sciences at NWU (reference: NWU-01972-23-A4, Annexure E) and the Ethics Committee of NWDoH (Annexure D). The interview questions were treated with strict confidentiality (Annexures A & B), and the researcher managed them entirely.

3.11.1 Informed Consent

Before agreeing to participate, participants were provided detailed information about the study's purpose, procedures, risks, and benefits. They were assured of their right to withdraw from the study without consequences.

3.11.2 Confidentiality

Measures were implemented to protect the confidentiality of participants' personal information and interview responses. Identifying details were anonymised, and data were stored securely to prevent unauthorised access.

3.11.3 Voluntary Participation

Participation in the study was voluntary, and participants were not coerced or pressured to participate. They were informed that their decision to participate or decline would not affect their relationship with the researcher or affiliated organisations.

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3.11.4 Minimisation of Harm

Efforts were made to minimise potential harm or discomfort to participants during data collection. Sensitivity was exercised when discussing potentially distressing topics, and support services were available if participants expressed emotional distress.

3.11.5 Respect for Autonomy

Participants were treated with respect and dignity, and their autonomy was respected throughout the research process. They were allowed to ask questions, express concerns, and provide feedback, and their input was valued and considered in shaping the study's procedures and outcomes.

3.12 Chapter Summary

Chapter Three delineated the research strategy and methodology, offering a foundation for the study's inquiry. The research, grounded in a qualitative approach, was designed to elucidate the intricacies of examining the strategic communication plans inside the EMS in the North West Province.

The research design specified the strategy for gathering and examining data, employing purposive sampling to guarantee a varied selection of participants. Data was collected via semi-structured interviews utilising an interview guide, enabling a thorough examination of participants' perspectives. Subsequently, thematic analysis was employed to discern recurring patterns and themes in the data, yielding significant insights into the communication issues and potential within EMS. The research process emphasised ethical problems, guaranteeing that the participants' rights, anonymity, and well-being were maintained.

Chapter Four will provide a detailed summary of the findings and results from this research study. The objective is to thoroughly analyse the data, revealing significant insights from the qualitative investigation. This chapter is essential for achieving the study's objectives, as it will analyse and interpret the data to uncover noteworthy findings.

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CHAPTER 4: DATA ANALYSIS AND PRESENTATION

4.1 Introduction

This chapter employs primary data to analyse the strategic communication practices of EMS in the North West Province of South Africa. It seeks to clarify the frameworks and methodologies that direct the flow of information and the decision-making processes among critical stakeholders in the EMS sector. The research underscores the importance of effective communication among emergency medical personnel, healthcare administrators, and relevant public health organisations in facilitating a swift, coordinated, and efficient emergency response.

The central focus of this analysis is the critical research question: "*How effective are the existing strategic communication practices of EMS in the North West Province, and what enhancements may be implemented to increase their efficiency and influence emergency response outcomes*?" Evaluating this inquiry is crucial for the study and addressing the shortcomings in communication strategies within EMS in the North West Province.

Chapter Four identifies the key issues and challenges related to effective communication among EMS professionals in the North West Province, as described by participants. This exploration provides a foundation for targeted improvements to overcome communication barriers. Furthermore, this chapter shares the views of EMS personnel on initiatives to enhance communication practices. The focus is mainly on rural and resource-limited regions, where effective communication can significantly improve the quality of emergency services.

Understanding how effective communication can be enhanced through the efficiency and responsiveness of EMS personnel is essential. Therefore, a qualitative analysis of firsthand accounts from critical stakeholders, alongside a review of relevant literature, is imperative. This chapter presents practical and strategic improvements to enhance emergency response outcomes and patient care within South Africa's North West Province. Bronfenbrenner's Socio-Ecological Framework is used to deploy remedies to the inadequacies of this study.

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4.2 Socio-Ecological Model

Initially formulated by Urie Bronfenbrenner in 1979 to comprehend human development, the SEM has progressed to tackle diverse public health issues by highlighting the multi-tiered influences on health-related behaviours and results (Mohsin, Ahsan & Haider, 2024; Irwin, Hoxha & Grépin, 2019). Recent literature has enhanced this model in various contexts, showcasing its adaptability and significance in modern public health research and interventions. The SEM asserts that individual decisions do not exclusively dictate health behaviours but are profoundly shaped by broader social and environmental factors. This viewpoint is essential for comprehending intricate health challenges, such as the dual burden of malnutrition, influenced by elements at various levels, including personal dietary decisions, familial interactions, community assets, and national regulations (Mahmudiono, Segalita, C. & Rosenkranz, 2019:2).

The SEM has been crucial in directing initiatives to enhance health equity and tackle social determinants of health. Caperon et al. underscore the significance of a socio-ecological framework in developing health initiatives that involve communities and tackle the fundamental causes of health disparities (Caperon, Saville & Ahern, 2022:4). This methodology is reflected in Alkhair's research, which utilised SEM to examine the public health ramifications of disinformation during the epidemic, emphasising the interrelation of personal beliefs, societal norms, and governmental interventions (Alkhair, Yusof, Itam, Fisal, Yatim & Manaf, 2023:5). The notion views individuals as positioned among several hierarchical levels of influence (Harper *et al.*, 2018:641). This SEM is designed to visually represent the individual, family, organisational, community, and societal elements that affect health and well-being, as illustrated and adapted in Figure 4.1 on page 58 (Chynoweth *et al*., 2020).

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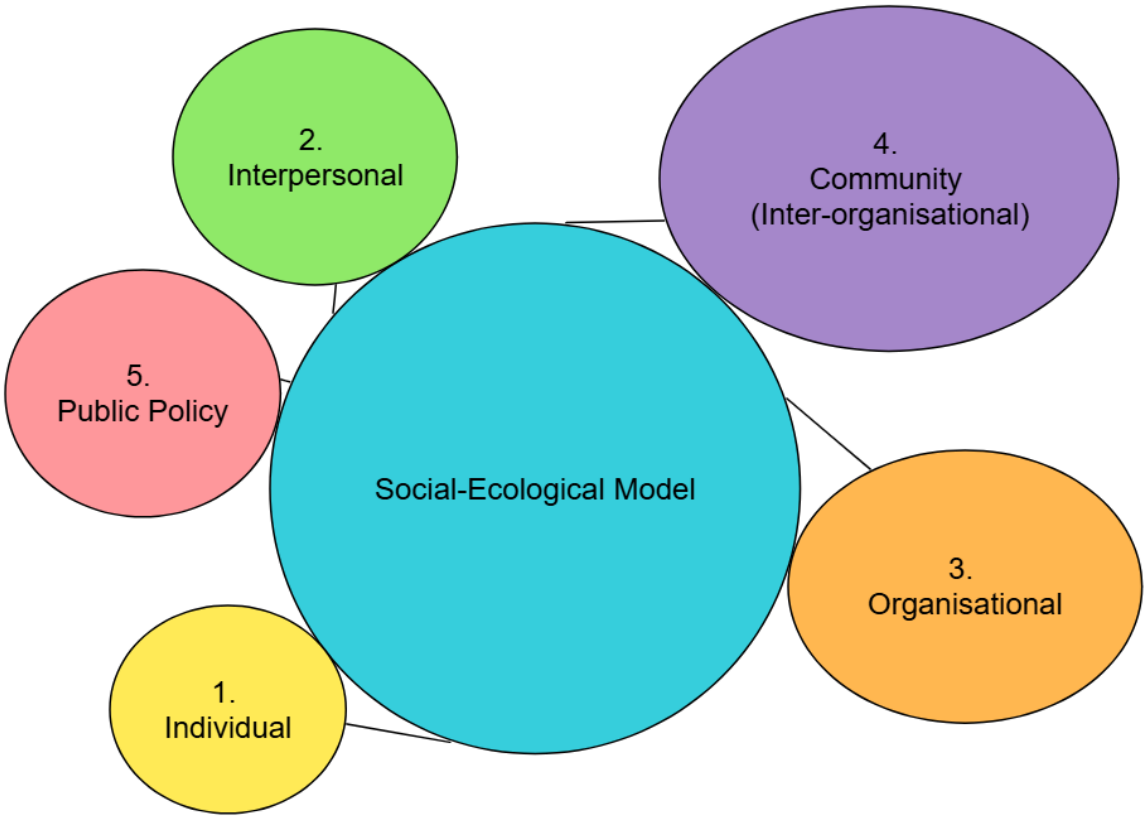


Figure 4.1: Socio-Ecological Model (Adapted) (Chynoweth *et al*., 2020)

Within the context of EMS and strategic communication, the SEM provides critical insights into the diverse aspects that affect communication practices and outcomes (Townsend & Foster, 2013:1101-1103). At the individual level, knowledge, attitudes, and perceptions about EMS services can affect communication patterns and emergency responses. Community dynamics, encompassing social norms and cultural perspectives on health and emergency response, function at the interpersonal and community tiers of the SEM, influencing communication pathways and access to EMS resources. Institutional elements, including EMS procedures, training programmes, and organisational culture, enhance communication between EMS personnel and external stakeholders, such as patients and community members (Ma *et al*., 2017:2430).

The SEM provides a framework for the intricate interactions of individual, interpersonal, community, organisational, and policy-level elements that affect behaviours and results in a specific setting. This model was utilised for the strategic communication analysis of EMS in the North West Province, facilitating the

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examination of how varying levels of influence affect communication practices and their efficacy in emergency response.

This study assessed EMS professionals' knowledge, attitudes, skills, and communication abilities at the individual level. It addressed their challenges, including their ability to communicate effectively in high-pressure situations and their understanding of protocols. Recognising obstacles at this level is crucial for enhancing communication efficacy within EMS teams.

The interpersonal dimension of the SEM analysed interactions between EMS professionals and other stakeholders, including hospital managers, patients, and community members. Efficient communication among these entities is essential for orchestrating emergency responses, as misunderstandings among teams or with patients can impede efficient treatment delivery. Improving interpersonal communication is, therefore, a key objective for enhancing outcomes.

The community level included the broader environment of the North West Province, encompassing social conventions, cultural influences, and overall understanding that affect communication within EMS. Community perceptions regarding EMS services and the availability of support networks might affect the implementation and reception of communication tactics. Understanding these processes facilitates the formulation of culturally and contextually suitable communication techniques.

The organisational level examined how communication was structured within EMS organisations. This process included the protocols, training programmes, and internal communication systems influencing interactions. It focused on how effectively these organisational structures facilitated communication among EMS workers and various emergency response units. Recommendations for policymakers and EMS managers focused on this level to ensure that systems and structures promote effective communication, particularly in rural and resource-limited areas.

The policy level examined the overarching rules and laws that affect communication practices within EMS in the North West Province. This encompassed national or provincial rules regarding emergency response, communication methods, or financial support for EMS services. Modifications at this level can profoundly influence the execution of communication procedures throughout the EMS system.

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Recommendations for policymakers emphasised the establishment of an environment conducive to successful communication through enhanced guidelines, resources, and support. Utilising the SEM framework to assess the efficacy of strategic communication practices in EMS enabled the research to pinpoint issues and opportunities for improvement at all levels, offering insights into the factors that affect communication within the North West Province. This approach ensured that suggestions for increasing communication were customised to the distinct requirements and difficulties of each level, thereby optimising the efficiency and results of EMS. Figure 4.2 illustrates how these concepts are connected.

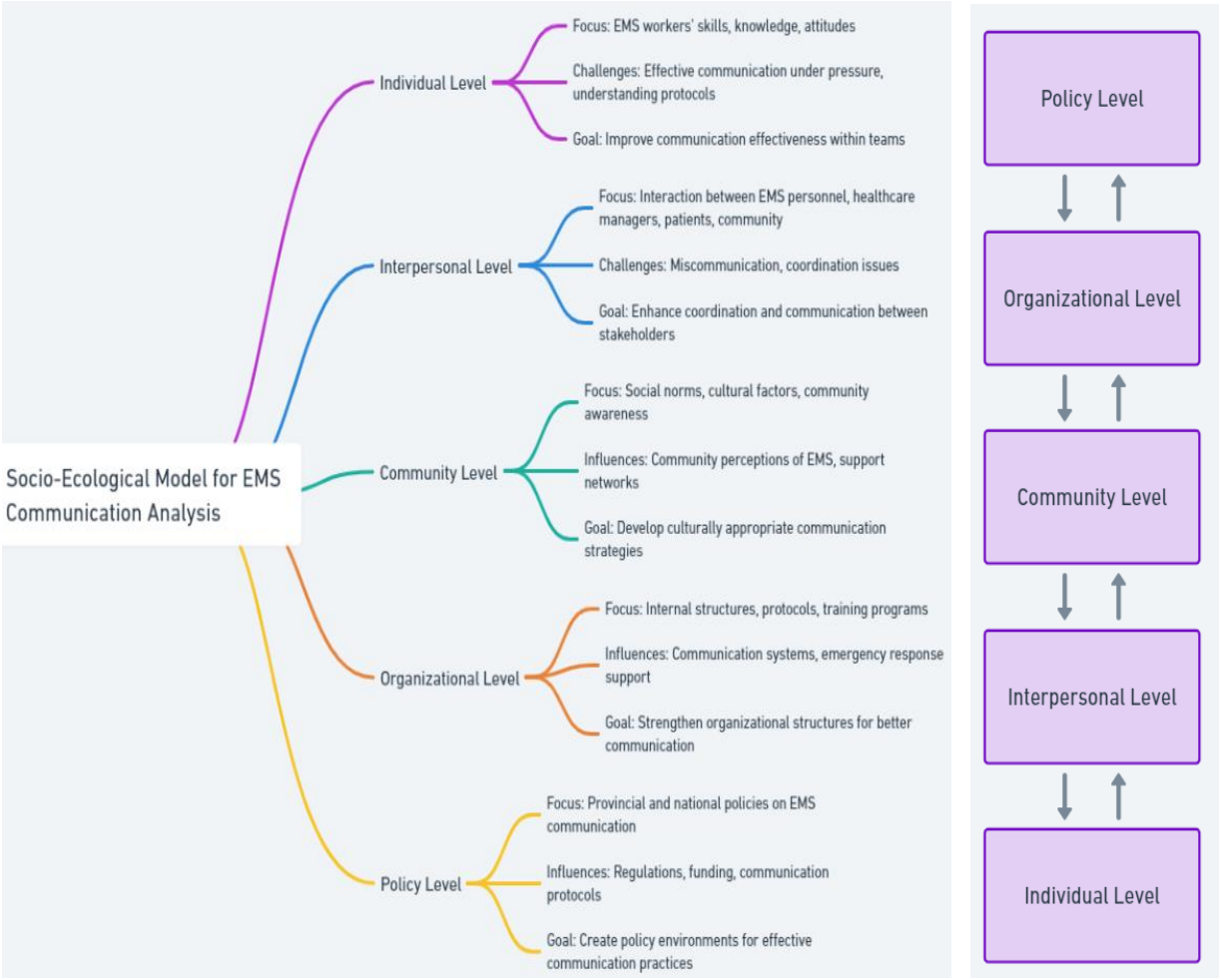


Figure 4.2: Application of Socio-Economic Model on the North West Province EMS

4.3 Participants Background Information

The study included eight participants, all EMS workers in the North West Province. The subsequent Table 4.1 delineates the distribution of participants interviewed by the researcher. Fifteen participants constituted the study sample; however, saturation was

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reached with the eighth participant. Saturation indicates a point where subsequent data gathering yields no new information or themes, signifying that the researcher has sufficiently understood the phenomenon being examined (McKay, Lannegrand, Skues & Wise, 2020; Fofana, Bazeley, & Regnault, 2020). One primary saturation indicator is the repetition of themes or ideas across interviews. When subsequent interviews produce similar responses and fail to present new perspectives, researchers can deduce that saturation is imminent or has been attained (Taghadosi, Valiee & Aghajani, 2021; Fan & Hu, 2018). Qualitative researchers employ saturation as a criterion to cease data collection (Saunders *et al.,* 2018:1894). Fusch and Ness (2015:1408) assert that the inability to achieve saturation can adversely affect research quality. Morse (1995:148) observes that saturation is frequently presented as a hallmark of qualitative rigour. All participants engaged voluntarily and provided significant contributions to the study. The researcher and participants had no prior acquaintance before the study began.

Table 4.1: Demographic information

Participant No.	Gender	Age	Status
1	Female	55	EMS Personnel
2	Female	34	
3	Female	43	
4	Female	42	
5	Male	52	
6	Female	41	
7	Male	52	
8	Male	41	

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Among the eight EMS professionals, five were female, and three were male, indicating a predominance of female employees in EMS. Seven employees were aged between 41 and 55, while one was 34. The collective experience of these personnel amounted to 148 years of EMS service, indicating that their convictions were well-founded in this study, and their perspectives encapsulated the essence of this research entirely. Qualifications varied from BLS to ALS.

4.4 Analysis of Primary Data and Coding

The study began by collecting codes from the narratives of eight participants. These codes, reflecting diverse viewpoints and expertise on EMS communication strategies and services, were the foundation for the thematic analysis. By consolidating linked codes and identifying overarching themes, the researcher attained an understanding of EMS services. This comprehension aligned with the study's overarching research aims.

The researcher initiated the inductive process by examining and interpreting the data collected from the transcripts. This was achieved through open coding, a prevalent qualitative coding technique in which the researcher analyses the data in real-time, generating and applying codes that appropriately represent the recorded events. The researcher formulated and utilised these codes to discern developing themes and concepts, concurrently examining the data inside each category produced during the preliminary analysis phase. During this procedure, patterns within the data sources were identified through a method known as pattern coding. Thus, the researcher consolidated the data into fewer analytical concepts by enhancing codes throughout the open coding phase.

Identifying themes from the data was guided by a focused examination of the narratives to reveal repeating patterns relevant to the study's objectives and research questions. This phase was essential in connecting individual experiences with the overarching perspective of the study, facilitating an understanding of EMS personnel communication and the services they provide. The statements from participants were crucial in the coding process, providing direct insight into the lived experiences and viewpoints of individuals engaged in EMS. The running memos, augmented by participant comments and field notes, were essential in encapsulating the findings, enabling a more profound engagement with the content.

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The analysis employed a combination of inductive and deductive coding, utilising relevant theoretical frameworks and literature to enhance the contextual depth of the findings. This methodological approach strengthened the academic foundation of the study and facilitated a nuanced understanding of communication within EMS and their services in the North West Province of South Africa. The theme analysis, bolstered by methods and a comparative approach, emphasised the study's dedication to academic integrity and practical significance. Table 4.2 presents a road map including the themes, categories, codes, and direct quotations from participants. This table is essential to the study as it provides guidance and an overview of whether the research objectives were achieved and the research question was answered.

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Table 4.2: Themes of the study

Theme	Categories	Codes	Direct Quotes
Operational challenges within EMS	Disgruntlement among EMS employees	Employer not reimbursing personal resources	"*We had to start by using our personal mobile phones, but there was no reimbursement of the resources we used. We are expected to download WhatsApp and use…" (P1).*
		Use of personal resources by employees	*"We had to start by using our personal mobile phones, but there was no reimbursement of the resources..." (P1).*
		Unavailability of systems within the EMS	*"No, we do not have a system in place for that, so when the call is missed, it is missed, and the patient needs to call back" (P3).*
		Unavailability of mobile network	*"One of the main problems we face when it comes to communicating is network problems, especially during load shedding. If we could make use of two-way radios, it could reduce the problem of the network. We use a manual system, so if it could be digitised, it could make things move quicker and more efficiently" (P2).*
	Shortage of critical resources required to facilitate EMS systems	Shortage of communication radios	*"Other than data, we are not able to communicate with the personnel in the ambulances because we do not have two-way radios. When using mobile phones, the network can be a problem when communicating with ambulance personnel" (P6).*
		Shortage of data and airtime	*"That is another challenge; we use our phones, data, and airtime. The department does not cover the cost" (P7).*

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		Shortage of ambulances	*"We do not have ambulances, and there is a shortage of staff and resources" (P2).*
Communication systems and strategies within EMS	Information recording systems within EMS	Manual recording of information within EMS	*"When we receive a call, we record all the information taken on a call slip, and the call taker will give the information to the dispatcher to be able to give the information to the personnel in the ambulance" (P3).*
	Good understanding of languages	Do not experience language problems.	*"No, I have not personally experienced any challenges with different languages, as I usually try to meet them halfway. We try to meet the patients where they are, so we move in pairs that accommodate many types of language" (P4).*
	The process of reporting incidences to authorities does not communicate to different government departments.	SAPS, Fire department, healthcare centres	*"…They can go to the police station, and they can call an ambulance, go to the nearest clinic, and ask for an ambulance to be called for them" (P2).*
	Methods of communication within EMS	Currently use mobile devices.	*"Nowadays, we make use of mobile phones (work and personal) as we do not have two-way radios" (P1).*
		Internet communication	*"We are expected to download WhatsApp and use our mobile data, and thus, we are forced to make calls when one does not have data" (P8).*
		Previously used radios	*"In the past, we used two-way radios; unfortunately, we had challenges when they were broken. We then moved to cell phones" (P7).*
	Delays in responding to emergencies	Delay in ambulance arrival	*"...the delay in arriving at my place was that all ambulances were out" (P3).*
		The system is not able to meet the high demand for EMS	*"I was told that all ambulances were out to collect other sick people" (P3).* *"I was told that the call centre receives a huge number of calls, and it works on the first call, first served" (P5).*
		Ambulance shortages	*"We only had three ambulances to serve a large district; imagine we serve Orkney, Stilfontein, Hartebeesfontein, farms clinics, locations, Matlosane with two ambulances..." (P1).*
		Ambulance Hijacks	*"I have never experienced it, but I have heard that it happened before while the ambulance was carrying a pregnant lady and the ambulance was hijacked" (P1).*
	Emergency Response and Reporting Procedure	Follow a script	*"When we receive the call, we have a script that we follow…" (P1).*
		Make follow-up with the crew.	*"I follow up with the dispatched crews, I ask how many P1s/P2s/P3s (triage*

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			system) they have and what additional help they might need. We inform the hospital about the incoming trauma cases" (P4).
		Conduct Triage	*"The information gathered allows me to triage and prioritise the cases that need to be, and then we dispatch ambulances that are already on the road with the radios and work phones…" (P2).*
		Interviewing victims	*"We have a list of questions we ask such as how many cars are involved, what type of injuries or are there people trapped…" (P3).*
		Collaboration between stakeholders	*"Once I have gathered the information available, I start by calling the station manager, police, and traffic officers, and if there is entrapment, then we also call the fire department" (P3).*
		Escalating matters to authorities	*"We report such incident to the supervisor who will escalate the matter to high authorities" (P6).*
Community awareness programmes for EMS	Lack of Community engagement processes for EMS	Previous public community engagement	*"Yes, we used to engage with the public community; however, as of late, there is no public engagement at all…" (P2).*
		Current lack of public community engagement	*"No, we do not have any community engagement anymore. We used to visit schools and various places to educate the community about the challenges and common remedies" (P3).*
	Barriers to the community engagement process in EMS	Political interference	*"...This is due to political officials stopping sharing information over the phone while the ambulance is en route" (P2).*
		Fear of community members	*"...Another factor is that clients are unwilling to assist out of fear of making the situation worse" (P2).*
Gaps identified by EMS employees	Improvement in training	Need for continuous training	*"On-going in-service training would be a great help as everyone's capabilities are not the same, but it could bridge the gap" (P1).*
		Need dedicated staff to train others.	*"It would help a lot if we can have a dedicated person conducting refresher course…" (P3).*
	Emergency response time	Need for standardised response time.	*"It was once discussed but never materialised. For now, we do not have a set time response" (P2).*
	Increase workforce	Need staff recruitment	*"We experience a shortage of communication staff (dispatchers and call takers)*

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			and thus, that creates a backlog and breaks the communication..." (P2).
		We need a system that records missed calls.	*"Having a system that can record the missed calls as well as to increase call centre personnel" (P3).*
		Need of resources	*"If they can provide WIFI or departmental data, only one person (shift leader) can access it. The tablet is made available to everyone, but since there is only one, not many people can use it at once" (P4).*
	Need of more resources	Need modern technology	*"We need more new vehicles and modern technologies…" (P3).*
		Need of Ambulances	*"We also need more ambulances as there is a shortage of ambulances, with the resources required in them…" (P4).*
	Cell phones and radios	Need for two-way radios.	*"We need new and functioning two-way radios if not radio; we need work phones provided with data. More ambulances with the correct equipment inside" (P6).*
Stakeholder and community Awareness	Community activities	Increase public awareness	*"Yes, we do have those activities. However, they do not happen often. We speak on the radio to give more information to the community; we can also gather at the community hall for public awareness" (P1).*
		Increase community education	*"Yes, we do have community activities that we provide to educate the community when they have common problems." (P2).*
			"There are no programmes to educate and inform the public about our work and issues we face" (P3).
		Reintroduce the use of radio stations to educate the community and create awareness	*"We used to do that, not anymore. We used to use local radio stations. We had someone who was tasked with that, but since the person resigned, his position was never filled" (P5).*
Employee Training for EMS personnel	Communication Training	Handling emergency calls	*"Yes, we do receive communication training." (P2).* *"Yes, it was part of the fundamentals (6-weeks). It entailed how to communicate with our colleagues (Managers, Supervisors, etc.) as well as how to communicate with the call centre. Where to send the grievances we might have as employees" (P4).*
		Currently need refresher training.	*"Yes, it does; however, we need to have refresher courses for improvement. We used to have those training in the past" (P3).*

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		Some employees lack training.	*"No, a regular employee does not receive in-service training; however, a supervisor may get some here and there" (P5).*
		Communication training and strategies	*"Yes, we receive a short training on communication and how to talk to patients during an emergency" (P6).* *"Yes, we received a small training on communication strategies" (P7).*
	Continuous training and quality improvement	Standardisation of training of personnel	*"It was a 6-week course, as it was only basics" (P1).* *"2 years. It used to be 2 years, but now it is called the ECT diploma" (P2).* *"It takes 2 years" (P3).* *"It was a 2-year course; however, recently, it has become a 3-year course" (P4).* *"The duration was 4-5 weeks" (P5).* *"The duration of the course was 4 months" (P6).*

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4.4.1 Theme 1: Operational Challenges within EMS

Participants observed that while communication tactics were accessible, operational issues were also present. Effective communication is crucial for optimal coordination and patient care. In emergency medical settings, efficient communication may be impeded by numerous variables. During emergencies, EMS professionals frequently depend on many communication devices, including radios and smartphones (Gormley *et al*., 2022:5). However, technical difficulties may hinder communication, delaying acquiring essential information or relaying updates. Malfunctions in communication systems, network unavailability, or equipment failures can impede effective communication, jeopardising patient care. Participants identified several operational obstacles that could impact their jobs:

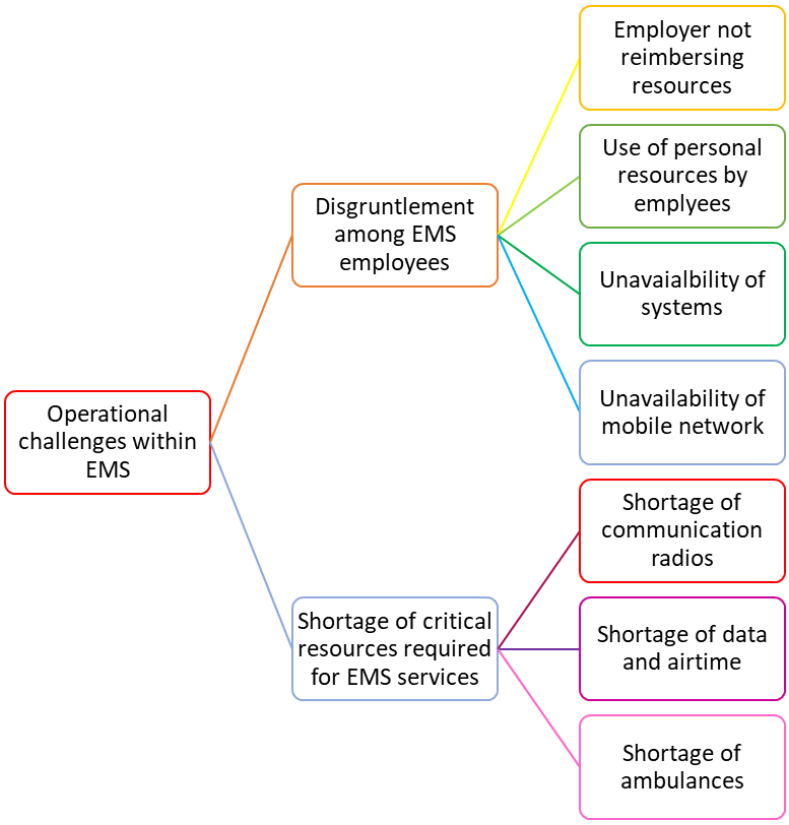


Figure 4.3: Visual presentation for Theme 1

4.4.1.1 Employer not reimbursing personal resources

Employees utilise personal resources to conduct company affairs. Utilising personal resources without financial compensation or remuneration impairs the operating efficiency of EMS personnel. Certain personnel get discontented, resulting in diminished motivation to perform their duties.

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This discontent impacts employee performance since some may intentionally refrain from communication, claiming a lack of airtime credit or data. Furthermore, it influences the reactions of other EMS professionals. Participants reported that the company failed to reimburse them for using their airtime credit or data. *"…We had to start by using our mobile phones, but there was no reimbursement of the resources." (P1).*

4.4.1.2 Use of Personal Resources by Employees

One of the participants indicated that using personal resources, such as mobile phones, impacted their work as they were compelled to expend their credit and data for corporate purposes. It is observed that not everyone would have access to information due to the unavailability of data. They stated, "*…We had to start by using our mobile phones, but there was no reimbursement of the resources..."* (P1).

4.4.1.3 Unavailability of Systems within the EMS

The absence of effective mechanisms for EMS may result in delayed response times, insufficient patient treatment, and an elevated death rate. Without effective dispatch mechanisms and knowledgeable individuals, the response time to assist persons in need is prolonged. This delay can be crucial in life-threatening scenarios where every second is vital. One participant stated, "*No, we do not have a system in place for that, so when the call is missed, it is missed, and the patient needs to call back.*" (P3).

4.4.1.4 Unavailability of Network

The lack of network connectivity exacerbates difficulties in emergency medical care by hindering communication among dispatchers, first responders, and hospitals (Senkamalavalli *et al*., 2023:528). In the absence of network connectivity, dispatchers face challenges in communicating essential information to emergency responders and coordinating with hospitals concerning patient conditions and incoming cases. The absence of a network leads to transmission issues, hindering the ability to make emergency calls or obtain location data, which delays ambulance dispatch, extends response times, and may adversely affect patient outcomes.

> Participant 2 confirmed this notion by saying, "*One of the main problems we face when it comes to communicating is network problems, especially during load shedding. If we could make use of two-way radios, it could reduce the*

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problem of the network. We use a manual system, so if it could be digitised, it could make things move quicker and more efficiently." (P2).

Participant 3 emphasised that "…*When using mobile phones, the network can be a problem when communicating with ambulance personnel*." (P3).

4.4.2 Shortage of critical resources required to facilitate EMS systems

4.4.2.1 Shortage of Communication Radios

The shortage of communication radios has significantly impacted strategic communication among EMS staff. A communication radio deficiency can significantly impede emergency personnel coordination, resulting in various operational issues. Participants observed that the deficiency of radios hampers communication among responders and with dispatchers, resulting in delayed reaction times and potentially jeopardising patient care. Shittu *et al*. (2018:381) assert that effective communication is essential for forming command structures and organising rescue operations in emergencies. A shortage of radios can undermine these systems, resulting in disarray and ineffectiveness.

A participant stated, "*Other than data, we are not able to communicate with the personnel in the ambulances because we do not have two-way radios...*" (P3).

Participant 1 reiterated, "*Nowadays we make use of mobile phones (work and personal) as we do not have two-way radios*..." (P1).

4.4.2.2 Shortage of Data and Airtime

Another factor impacting communication was a lack of data and airtime. Participants observed that they had transitioned to personal cell phones due to the scarcity of communication radios. Emergency Medical Services workers depend on data and communication channels to convey essential information, coordinate resources, and obtain real-time updates.

Insufficient data and airtime can impede communications, resulting in delays and inefficiencies in emergency response. Gormley *et al*. (2022:9) assert that inadequate data and airtime may impede accident paramedics from accessing critical information, including maps, incident specifics, and medical records, obstructing their capacity to make informed decisions and deliver prompt care.

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4.4.2.3 Shortage of Ambulances

A shortage of ambulances was recognised as a pivotal concern impacting the operations of EMS workers and posing substantial problems. The reduction in available ambulances is leading to increased response times for emergency calls, causing delays in delivering essential care to patients requiring assistance. Participants observed that the limited number of ambulances is overtaxed, resulting in extended waiting periods for individuals needing transportation to medical facilities and possibly neglecting other crises.

4.4.3 Theme 2: Communication System and Strategies within EMS

Efficient communication methods and tactics ensure seamless coordination and prompt reactions to emergencies. This issue examines the diverse communication systems and strategies EMS utilise to improve their efficacy in interacting with patients, healthcare providers, and other pertinent stakeholders. Participants emphasised that radio technologies are fundamental to EMS communication, facilitating uninterrupted contact among various vehicles, hospitals, and emergency services. Paramedics and EMTs frequently use cell phones to communicate continuously with dispatchers and fellow team members.

Furthermore, participants recognised diverse communication channels and strategies employed by EMS staff. Within this theme, two categories and five codes were delineated, reinforcing the established communication techniques and systems. Figure 4.4 depicts the diverse communication platforms and strategies EMS workers utilise.

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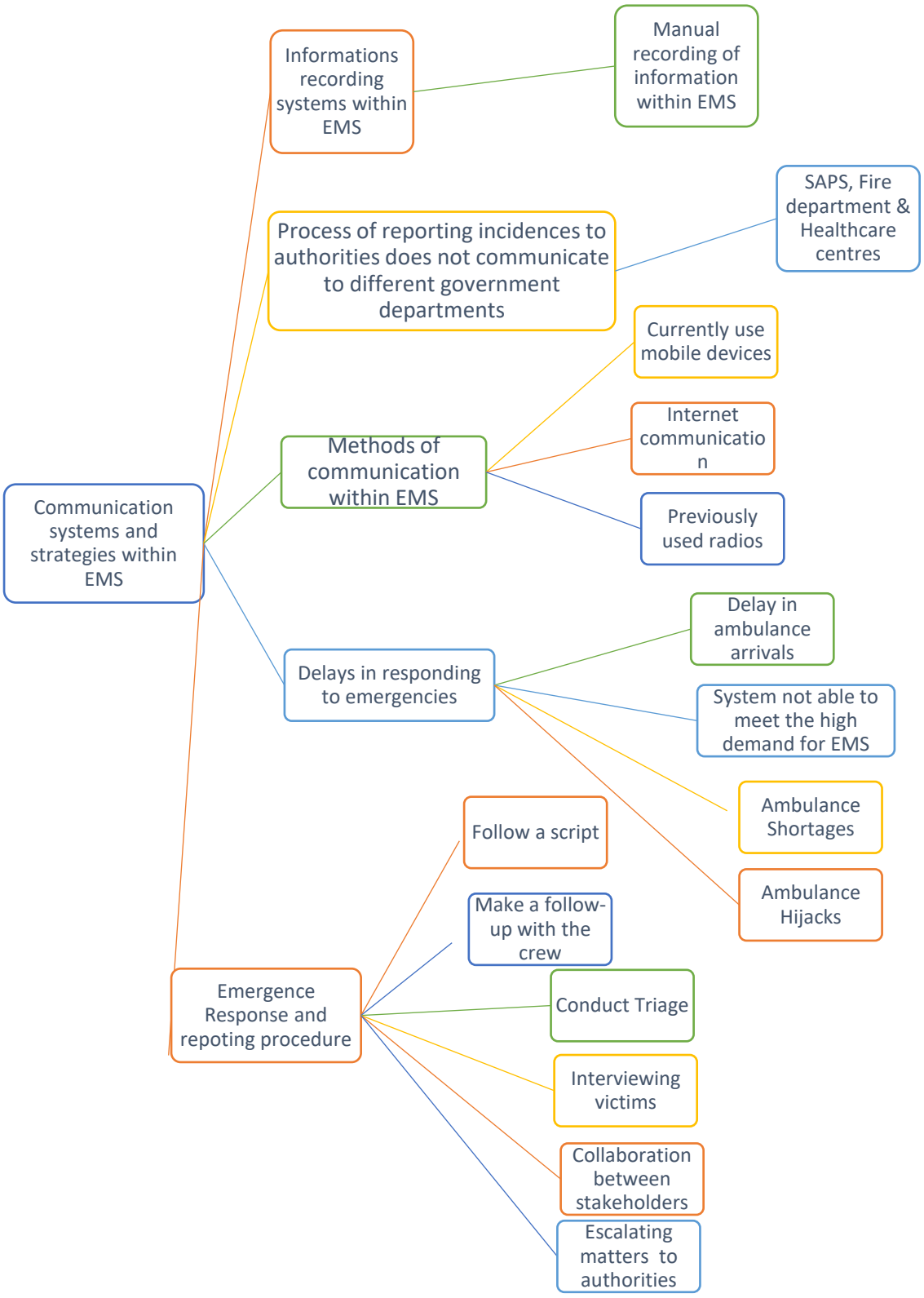


Figure 4.4: Visual representation of Theme 2

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4.4.3.1 Information Recording Systems within EMS

Manual recording of information

Documenting patients' or clients' information has become a crucial communication channel. Call centres enable communication between emergency responders, medical facilities, and other significant entities. Their function is to facilitate the fast dissemination of accurate information, allowing for swift responses and efficient patient care (Møller et al., 2021:10). Participants reported a manual procedure for documenting information obtained from clients on paper. The documented information will be provided to the ambulance staff responding to the scene. Despite the prevalent usage of digital technologies in contact centres for information collection and management, there remain instances where manual recording is necessary or preferred.

> Participant 3 stated, "*When we receive a call, we record all the information taken on a call slip, and the call taker will give the information to the dispatcher to be able to give the information to the personnel in the ambulance*." (P3).

4.4.3.2 The Process of Reporting Incidents to Authorities

SAPS, Fire department & healthcare centres

The reporting process to authorities was recognised as a crucial element in the EMS communication system. In the context of EMS call centres, reporting to authorities typically involves providing critical information about emergencies, patient care, and operational procedures to regulatory bodies, governmental organisations, or other relevant stakeholders. Emergency Medical Services call centres may be required to inform authorities of specific incidents, such as severe accidents, significant casualties, outbreaks of infectious diseases, or scenarios involving hazardous materials. Prompt and accurate reporting facilitates the coordination of emergency response efforts and the effective allocation of resources.

> One of the participants noted that *"they can go to the police station, and they can call an ambulance, go to the nearest clinic, and ask for an ambulance to be called for them."* (P2).

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4.4.3.3 Methods of Communication within EMS

Use of mobile phones

The study demonstrated that mobile phone utilisation is essential for EMS personnel (paramedics) and the general population. Emergency Medical Services staff utilise mobile phones to obtain dispatch orders, communicate with dispatchers, and coordinate their response activities. Mobile phones enable immediate communication between field responders and call centre personnel, improving coordination and decreasing response times. Mobile phones with GPS functionalities allow EMS personnel to navigate emergencies rapidly and efficiently. Mapping software provides current traffic information and route optimisation, facilitating quicker access for emergency services to patients.

> Some participants' statements support these views: “Nowadays, we use *mobile phones (work and personal) as we do not have two-way radios*” (P1).
>
> Another participant said, “*Only the shift leader has a work tablet to be able to communicate; from there on, we use our mobile devices and data to do work daily*” (P6).

Internet communication

The research also observed using Internet communication as an additional tactic employed by paramedics. Mobile data and Internet connectivity have gained paramount significance in EMS communication systems. These technologies provide immediate access to patient information, medical records, and essential physiological data (Kalid *et al*., 2018:10). Emergency Medical Services professionals can obtain this information en route to the incident, making informed judgements and customising their treatment plans accordingly. Furthermore, mobile data and the Internet transmit and receive secure communications, images, and videos, hence facilitating distant cooperation and decision-making (You *et al*., 2018:380).

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One participant stated, "…*We are expected to download WhatsApp and use our mobile data, and thus, we are forced to make calls when one does not have data. It affects work as some people miss messages because they do not have data or Wi-Fi*." (P8).

Previously used two-way radios

Participants mentioned that two-way radios had previously been a communication option. They expressed dissatisfaction with the discontinuation of two-way radio usage, noting that some devices were no longer functional. However, the strategic significance of these communication devices was acknowledged, and EMS staff expressed increased interest in acquiring them.

Two participants were cited stating, "*In the past, we used two-way radios. Unfortunately, we had challenges when they were broken. We then moved to cell phones*" (P7) and

"*We used to work with radios when dispatching ambulances; now we work with either work phones (that are few and far between) or your phones."* (P5).

Effective communication methods and strategies are crucial for EMS to ensure clear and dependable communication with patients, healthcare professionals, and other pertinent stakeholders (Meisel *et al*., 2015:315). Incorporating sophisticated communication technologies, including Device-to-Device (D2D) connectivity, has improved data transmission efficiency during emergencies. Device-to-device communication enables nearby devices to interact directly, circumventing conventional network infrastructures. This feature is especially advantageous when network congestion arises from elevated demand (Driouech, Sabir & Bennis, 2020; Sheng, Liu, Huang & Wu, 2022). The lack of such technologies might result in heightened delay and diminished reliability in communication, which are detrimental in critical situations.

Emergency Medical Services uses several technologies, including radio communication systems, mobile data, telemetry, and advanced mobile devices, to improve communication capabilities and guarantee prompt and effective emergency

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response. Moreover, training and education are essential in providing EMS staff with the requisite skills for successful and compassionate communication with patients.

4.4.3.4 Delays in Responding to Emergencies

Delay in ambulance arrival

Prompt intervention is essential in medical emergencies, and delays in ambulance response can result in significant consequences. Møller *et al.* (2021:5) assert that a sudden surge in emergency calls may overwhelm ambulance systems, leading to extended response times.

To address this issue, ambulance services may implement strategies such as prioritising calls based on severity, optimising dispatch procedures, and deploying additional units during peak demand.

Systems are not able to meet the high demand for EMS.

The emergency response technique is essential for delivering prompt and adequate medical aid during crises. Nehme *et al*. (2016:785) suggest that EMS professionals can guarantee optimal patient care during medical emergencies by adhering to these protocols and recommendations. Several community residents saw a delay in EMS response to calls. Significant delays were ascribed to a scarcity of resources and work-related pressures.

Ambulance shortages

Insufficient ambulance fleets or resources may result in delays, particularly in areas with elevated demand or limited distribution. To reduce response times, it is advantageous to increase the number of ambulances, strategically position them in areas of high demand, and optimise their deployment based on demand patterns.

> Participant 3 acknowledged the paucity of ambulances and remarked, "*We only had three ambulances to serve a large district; imagine we serve Orkney, Stilfontein, Hartebeesfontein, farms clinics, locations, Matlosane, with two ambulances...*" (P3).

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Ambulance Hijacks

Ambulance hijackings are rare but constitute a significant threat, endangering both patients and emergency responders. Criminals may specifically target ambulances to perpetrate robbery, steal medical equipment or pharmaceuticals, or even abscond with the vehicle itself. Individuals may sporadically unlawfully commandeer ambulances to satisfy their transportation needs, such as fleeing a crime scene or seeking medical aid for themselves or others.

> According to Participant 1, "*I have never experienced it, but I have heard that it happened before while the ambulance was carrying a pregnant lady and the ambulance was hijacked*" (P1).

4.4.3.5 Emergency Response and Reporting Procedure

Follow a script

Participants said they followed a script when receiving calls, with the EMS dispatcher first inquiring to assess the situation's urgency. The dispatcher evaluates the patient's condition to determine the level of service required. Upon arrival at the scene, EMS professionals thoroughly assess the patient's condition, including checking vital signs such as heart rate, respiration rate, blood pressure, and oxygen saturation levels. They also collect supplementary information, including the patient's medical history and known allergies or medical issues. Following the evaluation, the EMS personnel administer suitable initial treatment to stabilise the patient. This may involve the administration of drugs, the execution of cardiopulmonary resuscitation (CPR), or the utilisation of specialised medical apparatus.

> Participant 1 said, "*When we receive the call, we have a script that we follow. Firstly, we ask what the situation is, once explained, we ask further questions about what medication they take, when last they ate a meal, and various questions to gather information about the situation*." (P1).

Make follow-up with the crew

EMS staff may need to extricate the patient from a hazardous or confined situation if necessary. Specialised equipment and methodologies will be utilised to ensure the

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patient's safety throughout transportation. The EMS crew continually communicates with dispatch, other EMS units, and hospital personnel, providing regular updates on the patient's condition, noting any changes, and documenting all pertinent information.

> Participant 4 mentioned their approach to such incidents: "*I follow up with the dispatched crews, and I ask how many P1s/P2s/P3s they have and what additional help they might need. We inform the hospital about the incoming trauma cases*." (P4).

Conduct triage

The South African Triage Scale (SATS) serves as the principal instrument for categorising patients according to the urgency of their medical requirements. Developed to confront the challenges encountered by EMS providers in resource-limited environments, the SATS facilitates effective prioritisation of care based on clinical acuity and the nature of presenting conditions (Mould-Millman, Dixon, Burkholder, Pigoga, Lee, Vries, Moodley, Meier, Colborn, Patel & Wallis, 2021; Adeniji & Mabuza, 2018; Dixon, Burkholder, Pigoga, Lee, Moodley, de Vries, Wallis & Mould-Millman, 2021). The triage process commences with an initial assessment performed by EMS personnel upon arrival at the scene. This assessment is vital as it establishes the appropriate triage category for each patient, classified into five colour-coded levels: red (immediate), orange (very urgent), yellow (urgent), green (less urgent), and blue (non-urgent) (Alshehri *et al*., 2020:640).

A designated area for triage is established where patients can be assessed and categorised based on the severity of the mass casualty. One participant observed that they performed a rapid initial assessment of all individuals to determine their level of consciousness, respiration, and blood circulation. Immediate medical attention is then provided to individuals designated as "Immediate" to stabilise their condition and prevent further deterioration.

> This notion is supported by Participant 2, "*The information gathered allows me to triage and prioritise the cases that need to be, and then we dispatch ambulances that are already on the road with the radios and work phones. We convey the crucial information to the ambulance as well as the address of the situation. If it is a remote area that is not easily accessible or a place that does*

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not show up on the GPS, we may have a pick-up point where we ask them if they can meet us there." (P2).

Interviewing victims (patients)

Interviewing victims during an emergency response is essential for gathering information about the occurrence, assessing injuries, and determining the most appropriate course of action. During these interactions, it is vital to exhibit empathy and sensitivity while prioritising the victim's urgent needs (Yu *et al.*, 2022:245). Furthermore, acquiring relevant information is crucial to support response efforts. One participant noted that they asked accident victims a series of questions to determine the most effective way to assist.

Participant 3 said, "*We have a list of questions we ask such as how many cars are involved, what type of injuries or are there people trapped...*" (P3).

Collaboration between stakeholders

Participants noted that once they had gathered sufficient information about the incident, they contacted the police and fire departments. Efficient emergency response relies on the crucial cooperation of all stakeholders to ensure a coordinated and effective endeavour (Shittu *et al.*, 2018:381). This collaboration often involves multiple parties, including emergency services, governmental bodies, NGOs, community organisations, and affected individuals.

Escalating matters to authorities

Engaging authorities in emergency response situations when the incident exceeds the capacity or jurisdiction of the emergency response team is essential (Khan *et al*., 2018:11). The emergency response team follows prescribed protocols for escalating crises, either within the organisational hierarchy or to external authorities. P3 emphasised adherence to "…*the organisation's reporting protocol*" when documenting accident cases.

4.4.4 Theme 3: Community Awareness Programmes for EMS

Communities must recognise the significance of EMS and their role in efficiently addressing emergencies. Community awareness facilitates prompt and efficient

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emergency response (Tambo *et al*., 2017:290). Informing the community about EMS can enable individuals to recognise the signs of emergencies and request assistance promptly. Furthermore, enhancing community knowledge can mitigate emergencies by advocating health and safety behaviours. The illustration below depicts the interrelation of themes and categories associated with community awareness initiatives.

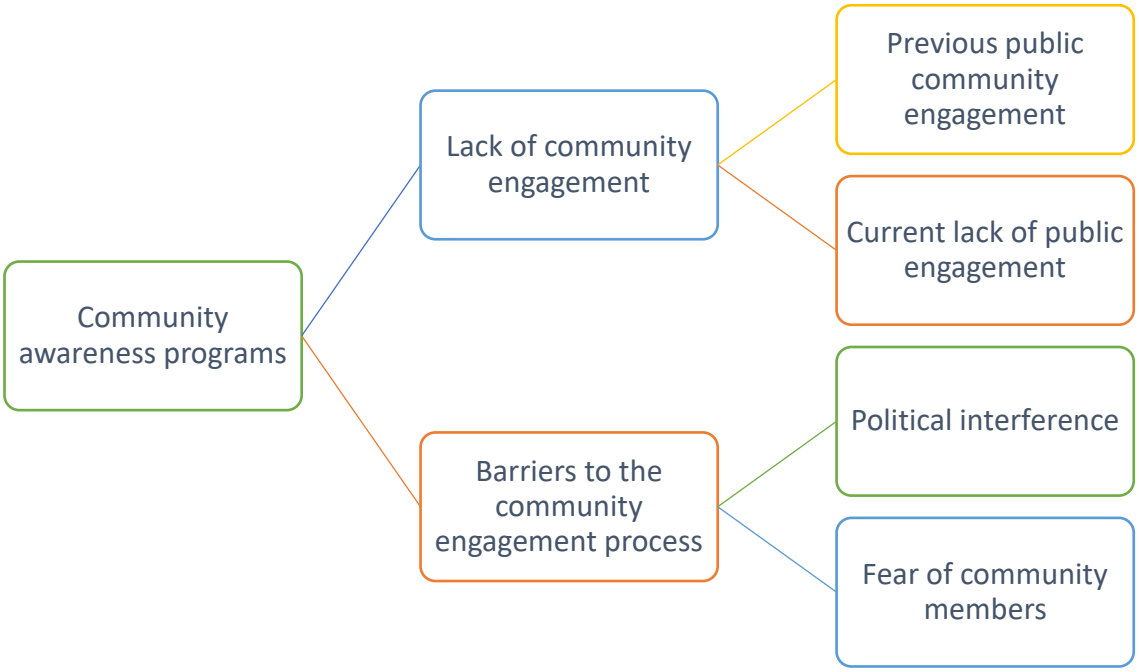


Figure 4.5: Visual Representation of Theme 3

4.4.4.1 Lack of Community Engagement Processes

Previous public community engagement

Participants indicated that community awareness initiatives were being implemented, albeit irregularly. Some awareness efforts involved educating individuals about the typical indicators of medical emergencies and understanding when assistance is needed. These encompass intense thoracic pain, respiratory distress, abrupt loss of consciousness, significant haemorrhaging, and unexpected alterations in behaviour. Participants observed that this awareness had ceased.

> To substantiate this claim, one participant stated, "*Yes, we used to engage with the public community; however, as of late, there is no public engagement at all*…" (P2).

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Current lack of public community engagement

The lack of public community involvement by EMS was identified as an obstacle to emergency response initiatives. Without active public community engagement, there may be widespread ignorance regarding emergency preparedness measures, such as knowing who to contact during a crisis or how to respond to specific situations. This can lead to delays in seeking assistance or prompting incorrect reactions.

> Participant 3 shared their thoughts by saying, "*No, we do not have any community engagement anymore. We used to visit schools and various places to educate the community about the challenges as well as the common remedies*." (P3).

4.4.4.2 Barriers to the Community Engagement Process in EMS

Political interference

Political interference was identified as contributing to the effectiveness of community participation projects. This interference may compromise the authority of emergency response professionals and specialists, leading to decisions influenced by political objectives instead of evidence-based methods.

> One participant said, "...*This is due to political officials stopping the sharing of information over the phone while the ambulance is en route.*" (P2).

Fear of community members

The participants noted that community members' apprehensions significantly influenced community participation processes. According to the participants, many community members hesitate to participate in initiatives led by EMS professionals, fearing they might worsen situations when attempting to assist accident victims or patients. Additionally, participants observed that some individuals lack the confidence to engage in these initiatives.

4.4.5 Theme 4: Employee Training for EMS Personnel

The research identified communication training as vital in developing effective communication methods. Effective communication is essential for ensuring patient safety and optimising care from receiving a call until the patient is released.

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Participants reported undergoing multiple training programmes to enhance their communication abilities. Among the recognised training programmes were workshops and formal training sessions. These trainings include active listening, non-verbal communication, effective questioning methodologies, and dispute resolution strategies. Simulation exercises replicate real-life emergencies, enabling EMS professionals to hone their communication skills in a secure setting.

These exercises may encompass scenarios related to patient evaluation, team collaboration, and dispatcher communication. The theme delineated five codes, as illustrated in Figure 4.6.



Figure 4.6: Visual Representation of Theme 4

4.4.5.1 Communication Training

Emergency handling calls

Participants acknowledged their training in managing emergency calls, noting that it equips them with essential skills to handle high-pressure situations effectively. This training enables call centre personnel to listen attentively, document necessary information accurately, respond positively to patients or victims, and convey precise details to emergency responders. Participants also highlighted that formal training at

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an accredited college includes techniques to soothe patients and offer guidance during ambulance transport.

> These are statements by participants, "…*the department did take me to do a communications course at the EMS College in Orkney, North West, where we were trained on how to answer emergency calls and how to guide patients while the ambulance was still on the way. Ways to keep patients calm and how to deal with different situations, especially when patients are panicking*." (P1)
>
> "*Yes, we do receive communication training*." (P2).
>
> "*Yes, it was part of the fundamentals (6-weeks). It entailed how to communicate with our colleagues (Managers, Supervisors, etc.) as well as how to communicate with the call centre. Where to send the grievances that we might have as employees*." (P4).

Currently need refresher training.

Participants acknowledged their training in numerous communication domains; however, the necessity for refresher courses was recognised as a crucial factor in improving communication methods. Refresher training classes equip EMS professionals with contemporary communication and emergency management protocols. A participant explicitly stated the necessity for refresher training, as previously implemented, to enhance service delivery.

> One participant shared, "…*we need to have refresher courses for improvement. We used to have those training in the past*." (P3).

Some employees lack training.

While participants confirmed they had received training, one noted that certain personnel were inadequately trained. Proper personnel training is essential for attaining both personal and organisational goals. Insufficient employee training hinders optimal performance, adversely impacting overall productivity. This shortfall significantly impacts service delivery, leading to response delays, compromised execution of essential life-saving treatments, and suboptimal management of emergency calls.

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One participant said, "*No, a regular employee does not receive in-service training. However, a supervisor may get some here and there*." (P5).

Communication training and strategies

Effective communication is vital for EMS professionals to provide efficient patient care and guarantee patient safety and comfort. Training initiatives, including communication skills workshops, simulation exercises, and educational videos, can assist EMS personnel in refining their communication abilities and augmenting their overall efficacy in the field (Joseph *et al*., 2022:25). Investing in good communication training enables EMS organisations to augment patient safety, boost teamwork, and ultimately achieve superior patient outcomes. Participants reported receiving instruction in communication skills and diverse communication styles:

"*Yes, we received a short training on communication and how to talk to patients during an emergency*" (P6).

"*Yes, we received a small training on communication strategies*." (P7).

4.4.5.2 Continuous Training and Quality Improvement

Standardisation of training of personnel

The duration of the communication programme is a crucial aspect, alongside the training provided to EMS personnel. The duration required to develop exceptional communication skills in EMS varies according to the organisation and specific requirements. Emergency medical services providers typically receive foundational training encompassing theoretical and practical skills. This training primarily focuses on understanding emergency medical protocols, anatomy, and physiology. It includes essential communication skills, such as establishing patient relationships, conveying information clearly, and engaging in active listening. Participants noted that they participated in training programmes with differing completion periods. Participants reported the following:

"*It was a 6-week course, as it was only basics.*" (P1).

"*It takes 2 years*." (P3).

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"*It was a 2-year course, however recently it has become a 3-year course*." (P4).

"*The duration was 4-5 weeks*." (P5).

"*The duration of the course was 4 months*." (P6).

Upon successful completion of the initial training, EMS workers may advance to further training to develop their skills further. This course emphasises certain communication methods for emergency room (casualty) and patient care environments. Advanced training extends beyond two years.

> One participant remarked, "*…2 years. It used to be 2 years, but now it is called the ECT diploma."* (P2).

The duration of training necessary to cultivate proficient communication skills in emergency services may differ based on individual and organisational needs. From initial training to continual professional development, EMS workers consistently endeavour to enhance their communication skills to provide optimal care for their patients. HPCSA mandates EMS personnel to participate in a specified number of Continuing Education Units (CEU) annually to remain current with the latest knowledge and abilities in the field (Barger *et al*., 2018:60). These courses encompass a diverse array of subjects, including communication, health care, and technology. The EMS professionals frequently participate in peer teaching and mentoring events to disseminate their expertise and experiences among colleagues. This approach fosters ongoing learning while facilitating constructive feedback and enhancing communication skills. Technological advancements have enhanced the accessibility of online learning resources. Emergency Medical Service personnel can improve their communication skills, acquire new techniques, and remain informed about the latest research and best practices through online courses and webinars.

4.4.6 Theme 5: Stakeholder and Community Awareness

Stakeholder awareness initiatives are essential in emergency response to guarantee that all pertinent stakeholders comprehend their positions, duties, and the overarching goals of the response endeavour. The study's findings indicate that stakeholder awareness programmes are infrequently implemented, impacting cooperation

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between EMS staff and other entities. The categories and codes are illustrated in Figure 4.7.



Figure 4.7: Visual Representation of Theme 5

4.4.6.1 Community Activities

Increase public awareness

The lack of public awareness was identified as a barrier to the community's ability to acquire knowledge on managing emergencies. The EMS rarely engages in public awareness initiatives, and when these events do occur, they are typically held in community halls.

> Participant 1 stated, "*Yes, we do have those activities; however, they do not happen often. We speak on the radio to give more information to the community; we can also gather at the community hall for public awareness*." (P1).

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Increase community education

Educating the public about medical services is essential for safeguarding community health. Raising awareness about EMS was identified as an additional community initiative undertaken by EMS workers.

To strengthen community preparedness, EMS should host seminars or training sessions addressing subjects such as CPR, fundamental first aid, and emergency response protocols (Lauridsen *et al*., 2022:175).

> A participant affirmed their frequent engagement in community education by saying, "*Yes, we do have community activities that we provide to educate the community when they have common problems. For example, when dealing with a baby with a high temperature, we give them possible solutions that could help them while they wait for the ambulance to arrive*." (P2).

Reintroduce the use of radio stations.

EMS personnel previously executed community awareness campaigns via radio stations. The following quote indicates that the position has remained unfilled since the departure of the individual formerly in the role:

> "*We used to do that, not anymore. We used to use local radio stations. We had someone who was tasked with that, but since the person resigned, his position was never filled*" (P5).

4.4.7 Theme 6: Gaps Identified by EMS Employees

This theme explores diverse strategies participants suggested for enhancing communication methods. Participants identified many solutions to improve communication among EMS professionals and other stakeholders. Figure 4.8 depicts various enhancement options proposed by participants.

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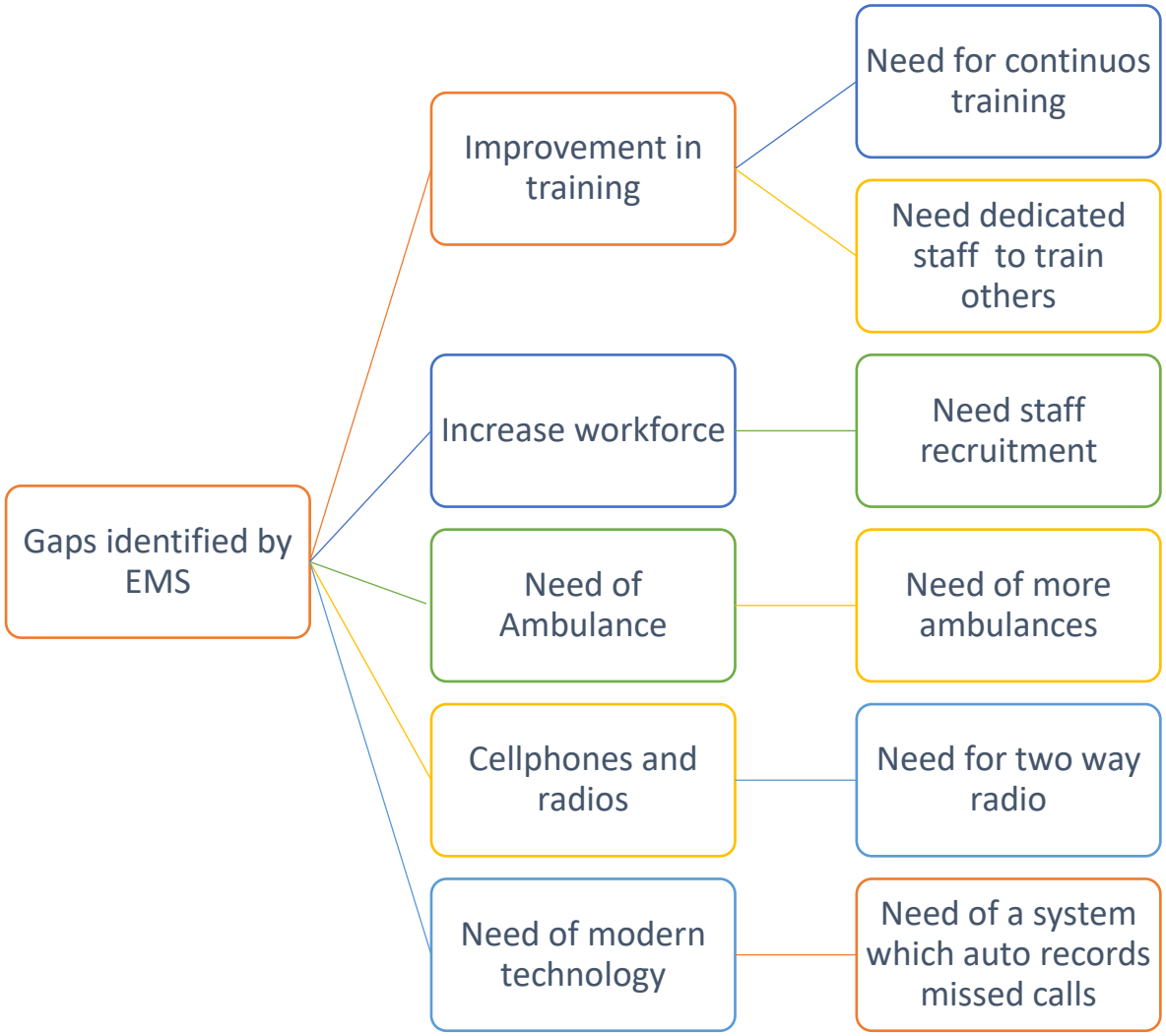


Figure 4.8: Visual representation of Theme 6

4.4.7.1 Improvement in Training

Need continuous training

Participants indicated the necessity for regular in-house training to enhance communication skills.

> One participant mentioned, "*Ongoing in-service training would be a great help as everyone's capabilities are not the same, but it could bridge the gap*." (P1).

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Need dedicated staff to train others.

Engaging devoted personnel to perpetuate the training of other employees is essential to ensuring an informed and proficient workforce. This guarantees uniformity in training methodologies, promotes knowledge dissemination, and aids new employees in more efficiently assimilating into the organisational culture. Participants observed that committed personnel can offer continuous assistance and mentorship to colleagues to keep them informed about new methods.

4.4.7.2 Emergence Response Time

Need standardised response time.

Vincent-Lambert and Mottershaw (2018) contend that the EMS systems in South Africa and the broader African continent are often underfunded, leading to prolonged response and on-scene times. Participants noted that EMS staff were not adhering to a standardised emergency response time. The dilemma is exacerbated by a lack of empirical knowledge regarding emergency care paramedics and other factors leading to these delays. The absence of detailed data hinders the execution of targeted initiatives aimed at improving response times and overall service delivery.

4.4.7.3 Increase Workforce

Need staff recruitment

Participants noted that the organisation was understaffed, which placed additional strain on EMS workers and impacted their daily responsibilities. The existing staffing was insufficient to manage the pressure and workload encountered by the organisation. Participants shared the following insights:

> "*We experience a shortage of communication staff (dispatchers and call takers), and thus that creates a backlog and breaks the communication*." (P2).
>
> "*We are short-staffed, but the workload is growing*." (P3).
>
> "*We also would need more staff as we are often short-staffed, which leads to poor service and backlog issues*." (P7).

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Need a system that records missed calls

The existing work system employed by EMS has been identified as obsolete and requires modernisation. Participants observed that the existing system was predominantly manual, highlighting the necessity for its digitisation. Participants mentioned the following:

> "*We also need to improve the systems used at the call centre to be able to record calls for quality control*." (P2).

> "*We also need to digitise the manual system we have because it adds to the backlog issue*." (P6).

4.4.7.4 Need for More Resources

Need modern technology

The participants observed that the organisation required contemporary technology to align with current work trends. Telemedicine strategies, which allow healthcare professionals to offer remote support and direction to EMS personnel in the field, are essential for improving diagnostic judgements. Participants indicated a need for GPS and mapping technologies to navigate incident areas effectively, thereby minimising response times and enhancing resource allocation.

Need of ambulances

The limited availability of ambulances negatively impacted EMS response times. Participants expressed a need for more ambulances to meet patient demands adequately. Participants shared their views by saying:

> "*We also need more ambulances as there is a shortage of ambulances with the resources required in them*" (P6).

> "*Secondly, we do not have enough vehicles; we need more vehicles, and our current fleet of ambulances is not in good condition*." (P4).

> "*Another recommendation I can make is to increase the number of ambulances available, as that can allow more EMS officials on the ground.*" (P7).

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4.4.7.5 Cell Phones and Radios

Need for two-way radios

Participants observed a scarcity of radios and expressed the necessity for additional operational units. This shortage of radios hindered their ability to perform their responsibilities efficiently. They shared their thoughts and perspectives on this pivotal matter:

> "*Working two-way radios and work phones with data for the majority of people.*" (P7).

> "*We need new and functioning two-way radios if not radio, and we need work phones provided with data*." (P8).

The Dispatch-Mediated Communication Model was employed to evaluate the effect of inadequate communication equipment on the performance of EMS personnel. This concept posits that efficient and structured communication is essential during emergencies, enabling rapid decision-making with minimal knowledge loss. In this case, effective communication among EMS professionals was hindered due to an inadequate number of operational two-way radios. As articulated by Jacobson *et al*. (2021:28), this approach emphasised the constraints imposed by the communication medium, which was restricted due to the availability of only a limited number of dependable radios and work phones.

Emergency Medical Services depend on communication equipment, including radios and cell phones, for real-time coordination among emergency responders. These devices facilitate disseminating information concerning patient status, incident locations, and resource availability. The lack of such devices may cause communication failures, leading to miscommunication or insufficient information, which can significantly impede the efficacy of emergency response operations (Watanabe, Sakai, Tanaka, Nagata, Osaka, Nakamura, Wu, Matsumoto & Gotoh, 2024; Ahmed, Ismail & Hassan, 2019). In scenarios necessitating swift decision-making, a lack of communication can postpone essential measures, impacting patient outcomes.

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Messages transmitted over the radio must be concise and unambiguous to prevent misunderstanding. Nevertheless, the respondents indicated that this was challenging owing to the restricted availability of operational radios, which exacerbated the difficulty of achieving this essential communication. The system specified that most emergency messages were communicated in shorthand or codes to guarantee the prompt transmission of critical information in the shortest period possible. However, in the absence of requisite tools, personnel could not use this systematic communication method, hence exacerbating the reaction time delay.

The implementation of the Dispatch-Mediated Communication Model highlighted how the lack of radios and work phones adversely affected the communication cycle of standardised messaging, which participants deemed essential for effective emergency responses. The model demonstrated that insufficient communication tools exacerbated the medium's inherent limitations, resulting in diminished effectiveness in information exchange during emergencies.

4.5 Chapter Summary

This chapter examined the strategic communication practices used by EMS in the North West Province. The research employed thematic analysis through inductive and deductive coding methods to identify the communication strategies. Analysis and classification of themes and categories revealed the communication tactics used by EMS and the effects of inadequate communication and insufficient training on EMS response times in the province. Chapter Five will conclude these findings, suggest recommendations, and propose a policy to address these shortcomings.

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CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This study examined strategic communication in EMS in the North West Province to identify challenges, propose solutions, and advocate for augmentations. In this concluding chapter, the researcher will synthesise the insights extracted from the study, providing pragmatic solutions for improving communication procedures and fortifying EMS operations.

5.2 Discussion of Primary Objective

The primary objective of this study was to analyse the efficiency of strategic communication techniques in EMS in the North West Province, concentrating on their influence on response times, coordination, and patient outcomes. Effective communication tactics are essential for the seamless operation of EMS, enabling responders to coordinate their efforts and provide timely and appropriate care to needy patients. Examining these communication methods encompasses several technologies and strategies, including mobile phone usage, Internet-based communication, and previously employed systems such as two-way radios. Each of these strategies significantly impacts the efficiency of emergency response operations, directly affecting patient outcomes.

The study emphasised the significance of mobile phone utilisation for EMS personnel in facilitating EMS operations. Mobile phones have emerged as the principal instrument for communication within EMS, mainly because of the constraints and lack of two-way radios. Participants utilise mobile phones to obtain dispatch orders, contact dispatchers, and coordinate with fellow team members, resulting in improved coordination and diminished reaction times. Mobile phones are vital navigation instruments owing to their GPS capabilities, which allow EMS staff to access real-time traffic information and choose the most suitable route for patient transport. This facet of communication is particularly crucial in the North West Province, where geographical obstacles may hinder emergency response logistics.

Participant feedback highlighted the reliance on mobile phones in the field. One participant noted using their mobile phone for professional and personal purposes due

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to the absence of two-way radios, emphasising the transition from radio-based systems to mobile communication.

Another participant pointed out that only the shift leader is equipped with a work tablet for communication, while other staff members use their mobile devices and personal data for daily tasks. These perspectives demonstrate that, while mobile phones have filled a considerable communication gap, they also provide challenges, particularly regarding resource accessibility and the requirement for physical involvement by EMS personnel.

Alongside cell phones, internet communication has become essential to EMS operations. The research underscored that internet connectivity via mobile data allows paramedics to obtain critical patient information and medical records while in transit to an emergency. Utilising messaging systems such as WhatsApp has grown prevalent for rapid information exchange, yet this practice presents obstacles, including the necessity for adequate data and dependable connectivity.

A participant noted the implications of this dependence on personal data, as individuals are required to download WhatsApp and utilise their mobile data, thereby necessitating calls when data is unavailable. This remark suggests that although Internet-based communication has improved connectivity and information access, it has created new obstacles, including disparities in access to digital resources among EMS personnel. These issues must be resolved to guarantee that communication stays continuous and efficient during emergencies.

The historical reliance on two-way radios in EMS communication is essential for understanding the transition to modern communication technology. Participants expressed dissatisfaction with the termination of radios, highlighting their strategic importance despite technological limitations. Participants noted that they had previously employed two-way radios. This suggests that the transition to mobile phone usage was partially driven by a necessity arising from equipment failures rather than a conscious decision to improve communication effectiveness. This transition to mobile and Internet-based tools offers prospects for improved communication capabilities, including GPS monitoring and real-time data access, while necessitating focused initiatives to guarantee equal access and reliability. Examining these changes

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is essential for determining how to enhance communication strategies for improved response times and coordination among EMS professionals.

This investigation primarily examines the impact of communication tactics on reaction times, which are directly linked to patient outcomes. Prolonged ambulance arrival can significantly impact outcomes, as prompt care is essential in medical situations. Factors such as an unforeseen increase in emergency calls or inadequate resources might burden EMS systems, resulting in delays. Møller *et al.* (2021:5) assert that prioritising calls according to severity and refining dispatch protocols can alleviate such delays. Nonetheless, effective communication is fundamental to these tactics, ensuring that dispatchers and responders remain coordinated and resources are appropriately allocated. The study revealed that inevitable delays are intensified by the unequal allocation of communication tools, as only a limited number of EMS personnel have access to work phones or Internet-capable devices. These findings reinforce the necessity for strategic investment in communication infrastructure and training, ensuring that all EMS professionals possess the requisite tools and abilities for effective response.

The research indicates that whereas contemporary communication technologies such as mobile phones and internet connectivity have improved coordination and decreased reaction times, they have concurrently posed access and resource allocation issues. Notwithstanding their constraints, the historical significance of two-way radios underscores the necessity for reliable communication devices in high-pressure emergency scenarios. These findings emphasise to legislators and EMS managers the necessity of investing in contemporary communication technologies and guaranteeing their accessibility for all personnel. Furthermore, training programmes must prioritise proficiently utilising these tools and ensure that EMS professionals are prepared to communicate effectively, especially in resource-constrained environments. The EMS system can augment its response capability and ultimately improve patient outcomes throughout the North West Province by rectifying the deficiencies revealed in this investigation.

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This contextual analysis corresponds with the research objectives by elaborating on how communication tactics affect EMS performance. The study identified areas for enhancement and provided a blueprint for establishing more resilient communication structures, which are crucial for delivering efficient and prompt emergency care.

5.3 Discussions of Secondary Objectives

The objective was to identify the primary issues encountered by EMS professionals in the North West Province regarding effective communication. The study highlighted the critical challenges EMS staff face in the North West Province, which is crucial for improving communication protocols in emergency response. The research identified a substantial barrier in the reliance on personal mobile devices for everyday communication requirements. It is pivotal to note that EMS staff must utilise their mobile phones and data to receive dispatch orders, communicate with other responders, and access critical information. This dependence arises from the restricted availability of work-issued devices and the lack of a standardised communication mechanism. This scenario imposes a financial strain on individual employees and causes discrepancies in communication efficacy since certain workers may miss critical updates due to insufficient data or unreliable connectivity. Confronting this obstacle is crucial to ensuring that all EMS personnel have equal access to communication resources, which is vital for effective emergency coordination.

While the transition to mobile phones has introduced enhanced features like GPS and real-time data access, it has not entirely replaced the reliability of radio communication. Study participants wanted to reintegrate radios as a supporting instrument to improve communication efficacy. The lack of a reliable backup mechanism has rendered EMS staff susceptible to communication failures, particularly in distant regions with inconsistent network connectivity. Identifying and rectifying these deficiencies using a hybrid communication strategy could enhance the reliability and efficiency of EMS responses.

Given these shortcomings, the study recommends that policymakers and EMS managers improve communication techniques, particularly in rural and resource-constrained environments. A primary recommendation is to invest in specialised communication infrastructure, which includes equipping each EMS team with work-

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issued mobile devices and the necessary data subscriptions. This approach would guarantee equitable access to communication tools, facilitating consistent and smooth interaction between field responders and dispatchers.

Furthermore, restoring two-way radios as an ancillary system could offer a crucial contingency option in regions with inadequate cell coverage, thereby minimising communication failures during critical crises. Implementing training programmes that emphasise the proficient use of modern communication tools while promoting community involvement regarding EMS protocols is advisable. These projects would enhance the resilience of the communication network inside the EMS system, resulting in improved response times and patient outcomes.

5.4 Achieving the Aims and Objectives of the Study

The strategic communication strategies utilised by EMS in the North West Province exhibit considerable strengths and substantial challenges that affect their overall efficacy in emergency response situations. The following research question is addressed: "*How effective are the existing strategic communication practices of EMS in the North West Province, and what enhancements may be implemented to increase their efficiency and influence emergency response outcomes*?" The strategic communication practices employed by EMS in the North West Province predominantly rely on mobile phones for real-time coordination and navigation, enhancing response times. However, this reliance on personal devices, coupled with inconsistent access to mobile data, has led to significant communication gaps among staff. The transition from two-way radios to mobile phones has removed a reliable backup option, particularly in regions with inadequate cellular coverage, raising concerns among EMS personnel.

To improve communication effectiveness, it is advisable to reintroduce two-way radios as supplementary tools, provide work-issued mobile devices, and implement targeted training programmes. Additionally, engaging with the community to cultivate trust and cooperation can further augment the efficiency of emergency responses.

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5.5 Proposed Policy Brief

5.5.1 Introduction

The effectiveness of EMS in the North West Province relies heavily on the implementation of proficient communication procedures. The existing strategies include mobile phone utilisation, Internet-based communication, and a historical dependence on two-way radios.

Although these technologies are essential for coordinating emergency responses, difficulties such as reliance on personal devices, uneven availability of mobile data, and the cessation of dependable backup communication channels like two-way radios have been recognised. Resolving these difficulties is essential to enhancing emergency response times, coordination, and patient outcomes.

5.5.2 Key Findings

- Emergency Medical Service staff employ mobile phones for essential functions, such as receiving dispatch orders, retrieving patient information, and navigating to emergency sites. The functionalities, especially GPS and real-time data access, are indispensable in these circumstances. Nonetheless, dependence on personal devices creates possible inequalities in access, as not all employees have adequate mobile data subscriptions.

- Platforms such as WhatsApp have become the norm for information dissemination among EMS personnel. Nonetheless, dependence on personal mobile data presents obstacles, particularly in rural regions where data affordability poses a challenge.

- The transition from two-way radios to mobile phones has eradicated a reliable backup communication mechanism, prompting apprehensions among EMS personnel, especially in isolated regions with inadequate cellular service. Two-way radios facilitated good communication between dispatchers and field responders, ensuring regular contact.

5.5.3 Policy Recommendations

- Reintegrate two-way radios into EMS operations to establish a dependable backup communication system, especially in remote regions with inadequate

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mobile network coverage. This would guarantee reliable communication during crises and decrease the danger of delays caused by cellular network problems.

- Radios should supplement cell phone usage, establishing a dual communication system that bolsters general resilience.

5.5.4 Investment in Communication Infrastructure

- Allocate money to equip all EMS staff with work-issued mobile devices and data plans, guaranteeing consistent access to communication resources.
- This investment would alleviate the strain on EMS personnel to utilise personal resources for work-related communication and guarantee that all responders possess the requisite tools for effective coordination.

5.5.5 Enhance Training Programmes for EMS Personnel

- Design and execute training programmes emphasising the proficient use of conventional and contemporary communication equipment, including two-way radios, GPS navigation systems, and Internet-based communication platforms.
- Training should prioritise abilities for sustaining clear communication in high-pressure scenarios and employing digital tools for rapid decision-making during emergencies.

5.5.6 Strengthen Community Engagement Initiatives

- Initiate awareness efforts to enhance community comprehension of EMS protocols and the significance of public collaboration during emergencies. This may encompass workshops, public forums, and educational resources.
- Involve community leaders to facilitate cultural communication between EMS teams and the public, fostering a more supportive atmosphere for emergency operations.

5.5.7 Develop Standardised Communication Protocols

- Formulate explicit communication protocols delineating the functions of mobile phones, two-way radios, and Internet platforms in diverse emergencies.
- Standardise methods to enhance communication techniques, diminish uncertainty among EMS staff and guarantee a synchronised approach across various teams and areas.

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5.5.8 Expected Outcomes

- Augmented communication capabilities have expedited reaction times and enhanced cooperation during emergencies, reducing information flow discrepancies.
- Enhanced efficacy of EMS operations in remote and resource-constrained regions by providing dependable communication technologies and infrastructure.
- Enhanced community relations, improving public collaboration and confidence in EMS services.
- An enhanced EMS system that ensures excellent communication across diverse conditions, prioritising patient outcomes even amid complex emergencies.

Utilising the SEM to examine EMS communication techniques in the North West Province offers a systematic approach to comprehending the elements that affect effective communication. The SEM, which perceives individuals and their behaviours as affected by several environmental and social influences, is especially effective for examining how communication strategies are formulated in EMS operations. This research illustrates the application of each level of the paradigm below:

Individual Level

This level evaluated individual EMS personnel's knowledge, attitudes, and competencies. In the realm of EMS communication, this level encompasses each responder's comprehension of communication protocols, adeptness with communication technologies, and resilience under constraint. Training in efficient communication and using specific EMS technology, such as radio and dispatch systems, directly influences their capacity to collaborate in high-pressure situations.

Interpersonal Level

At this level, interactions among EMS professionals, including cooperation, peer support, and collaboration, are essential for effective communication. Robust interpersonal ties can enhance information dissemination during emergency

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responses, but miscommunication among team members, dispatchers, and hospital personnel may impede response times. This study investigated the impact of these dynamics on communication flow, particularly the mutual support EMS professionals provide in coordinating and managing situations.

Organisational Level

The organisational level pertains to EMS agency policy, management practices, and the accessibility of communication resources. Policies concerning communication protocols, emergency dispatch systems, and routine training affect the interactions of EMS teams with one another and with external partners. This study identified organisational elements as the technologies employed (including radios and data terminals), the infrastructure available for EMS operations, and leadership support in addressing communication hurdles.

Community Level

This level examined the involvement of the wider community, encompassing partnerships with external agencies, hospitals, and local healthcare providers in the North West Province. Efficient EMS communication depends on robust relationships with other public health and safety entities. This study examined the impact of community-level factors, including geographical obstacles, infrastructural deficiencies, and collaborations with external healthcare providers, on EMS communication, which is crucial for effective emergency responses.

Policy Level

At the highest level, laws and regulations established by provincial or national authorities influence the EMS communication landscape. National standards for EMS protocols, public health policy, financing for communication technologies, and rules concerning public health emergencies all affect the communication practices of EMS professionals. This paper examined the effects of these policies on EMS communication and identified regulatory hurdles that may obstruct successful coordination and service delivery.

This study utilised the SEM to investigate how communication patterns in EMS are influenced by factors ranging from individual competencies to overarching policy

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determinants. By studying these levels, the study aimed to identify specific areas for improvement in EMS communication systems to boost emergency response efficacy in the North West Province.

Effective communication is fundamental to a responsive and efficient EMS system. By addressing the identified difficulties and executing targeted enhancements, the North West Province may fortify its EMS, ensuring communication facilitates rather than obstructs crucial response activities. Policymakers and EMS administrators must prioritise investment in communication tools, deliver extensive training, and interact with the community to establish a resilient system capable of addressing the needs of both urban and rural settings. These measures guarantee that EMS in the North West Province is adequately prepared to preserve lives and deliver prompt care to needy individuals.

5.6 Conclusion and Summary of the Study

Reflecting on the qualitative research into the strategic communication of the EMS in the North West Province of South Africa, the researcher can see how profoundly this experience has shaped his understanding of communication within critical service sectors. This study was not merely an academic endeavour but a journey into the heart of how information flows during emergencies and its significant implications for responders and the communities they serve.

Using a qualitative approach allowed the researcher to explore the nuanced experiences of EMS personnel and their communication practices in depth. The thematic data analysis offered a way to identify patterns and themes, revealing insights that might have been overlooked in a more quantitative framework. The researcher deeply valued the richness of the narratives collesxcted, with each interview providing a vivid illustration of the challenges and strategies that EMS workers navigate in a complex and often resource-strapped environment.

A key theme that emerged from the research was the critical need for clear and effective communication during emergencies. While established protocols are in place, the researcher found that the unpredictable nature of emergencies often leads to deviations from these guidelines. This gap highlighted the importance of ongoing training and the ability to adapt communication strategies on the fly. Additionally, the

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study underscored the significance of community perception and trust in the effectiveness of EMS, emphasising the need for transparent communication between EMS providers and their communities.

5.7 Personal Insights and Growth

This study has grown the researcher's understanding of the critical function that strategic communication plays in emergency services. Building connections, cultivating trust, and ensuring all voices are heard, especially in high-stress situations, are all part of communication, which is more than just sharing information. This realisation has changed the researcher's viewpoint on teamwork and leadership by emphasising the value of clarity and empathy in all dealings.

Carrying out qualitative research in this delicate field was challenging. It took tact and an emphasis on developing trust to access participants and ensure they were at ease discussing their stories. The study discovered how crucial it is to listen and actively establish a secure environment for candid discussion. These difficulties enhanced the research and brought attention to the human factor, which is sometimes missed in more conventional research.

This study has been a life-changing event for the researcher to examine the strategic communication of EMS in the North West Province. It has strengthened his conviction that good communication is essential to a successful emergency response. The researcher will carry with them priceless lessons about the intricacies of communication and its significant influence on community resilience and service delivery as they pursue their academic and professional goals.

The researcher prepared a draft policy as part of the recommendations and intervention for this study. See the attached Appendix F.

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REFERENCES

Adeniji, A.A. & Mabuza, L.H. 2018. 'Telephone Triage': a possible means of managing the after-hours patient load at primary health care facilities in South Africa. *South African Family Practice*, *60*(6):219-224.

Adeoye-Olatunde, O.A. & Olenik, N.L. 2021. Research and scholarly methods: semi-structured interviews. *Journal of the American College of Clinical Pharmacy,* 4(10):1358-1367. https://doi.org/10.1002/jac5.1441

Adom, D., Hussein, E.K. & Agyem, J.A. 2018. Theoretical and conceptual framework: mandatory ingredients of a quality research. *International Journal of Scientific Research*, *7*(1):438-441. https://www.worldwidejournals.com/international-journal-of-scientific-research-(IJSR)/fileview.php?val=January_2018_1514812002__202.pdf

Ahmadin, M. 2022. Social research methods: qualitative and quantitative approaches. *Jurnal Kajian Sosial Dan Budaya: Tebar Science,* 6(1):104-113. http://www.ejournal.tebarscience.com/index.php/JKSB/article/view/103 Date of access: 10 Nov. 2024.

Ahmed, I., Ismail, M.H. & Hassan, M.S. 2019. Video transmission using device-to-device communications: A survey. *IEEE Access, 7*(1):131019-131038.

Ajayi, V.O. 2017. Primary sources of data and secondary sources of data. *Benue State University*, 1(1):1-6.

Al Waziza, R., Sheikh, R., Ahmed, I., Al-Masbhi, G. & Dureab, F. 2023. Analysing Yemen's health system at the governorate level amid the ongoing conflict: a case of Al Hodeida governorate. *Discover Health Systems,* 2(1):15. https://doi.org/10.1007/s44250-023-00026-w

Alkhair, K.H., Yusof, M.H., Itam, M.F., Fisal, Z.A.M., Yatim, M.H.M. & Manaf, R.A. 2023. Analysing Public Health Impact of Misinformation During COVID-19 Pandemic using the Socio-Ecological Model: A Systematic Review. *Malaysian Journal of Medicine & Health Sciences*, *19*(1):1-12.

Confidential - Company Proprietary

Alshehri, M.F., Pigoga, J.L. & Wallis, L.A. 2020. Dispatcher triage accuracy in the Western Cape Government Emergency Medical Services system, Cape Town, South Africa. *Prehospital and Disaster Medicine*, *35*(6):638-644.

Al-Walah, M.A., Donnelly, M. & Heron, N.2024. Barriers, enablers and motivators of the “I’m an active Hero” physical activity intervention for preschool children: a qualitative study. *Frontiers in Paediatrics*, *12*(1):1-13.

Amu, H., Adjei, M.E., Dowou, R.K. & Bain, L.E. 2022. Adopting population-based interventions towards sustaining child health services in the midst of COVID-19 in sub-Saharan Africa: application of the socio-ecological model. *Pan African Medical Journal*, *41*(1):1-6.

Andersson, H., Granberg, T.A., Christiansen, M., Aartun, E.S. & Leknes, H. 2020. Using optimisation to provide decision support for strategic emergency medical service planning–Three case studies. *International Journal of Medical Informatics,* 133:103975. https://doi.org/10.1016/j.ijmedinf.2019.103975

Arnaouti, M.K.C., Cahill, G., Baird, M.D., Mangurat, L., Harris, R., Edme, L.P.P., Joseph, M.N., Worlton, T., Augustin Jr, S. & Collaborative, H.D.R.J.R. 2022. Medical disaster response: a critical analysis of the 2010 Haiti earthquake. *Frontiers in public health,* 10:995595. https://doi.org/10.3389/fpubh.2022.995595

Bailey, C., Knight, T., Koolmatrie, J., Brubacher, S. & Powell, M. 2019. Indigenous perspectives on operation RESET: an initiative to improve the identification and prosecution of child sexual abuse incidents in remote Indigenous communities. *Australian Psychologist*, *54*(3):187-192.

Balconi, M. 2010. Intentions and communication: cognitive strategies, metacognition and social cognition. In: Balconi, M. ed. *Neuropsychology of communication*: Springer. pp. 159-175. .https://doi.org/10.1007/978-88-470-1584-5_9

Barbour R.S. 2005. Making sense of focus groups. *Medical Education*, 39(7), 742–750. https://doi.org/10.1111/j.1365-2929.2005.02200.x

Barger, L.K., Runyon, M.S., Renn, M.L., Moore, C.G., Weiss, P.M., Condle, J.P., Flickinger, K.L., Divecha, A.A., Coppler, P.J., Sequeira, D.J., Lang, E.S., Higgins,

Confidential - Company Proprietary

J.S. & Patterson, P.D. 2018. Effect of fatigue training on safety, fatigue, and sleep in emergency medical services personnel and other shift workers: a systematic review and meta-analysis. *Prehospital Emergency Care,* 22(sup1):58-68. https://doi.org/10.1080/10903127.2017.1362087

Barthel, B.A. 2012. *9/11 Ten years after: command, control, and communications remain an issue*. https://apps.dtic.mil/sti/tr/pdf/ADA560685.pdf Date of access: 10 Nov. 2024.

Bazyar, J., Farrokhi, M. & Khankeh, H. 2019. Triage systems in mass casualty incidents and disasters: a review study with a worldwide approach. *Open Access Macedonian Journal of Medical Sciences,* 7(3):482-494. https://doi.org/10.3889/oamjms.2019.119

Bennett, C.L., Sullivan, A.F., Ginde, A.A., Rogers, J., Espinola, J.A., Clay, C.E. & Camargo Jr, C.A. 2020. National study of the emergency physician workforce, 2020. *Annals of Emergency Medicine,* 76(6):695-708. https://doi.org/10.1016/j.annemergmed.2020.06.039

Berger, C.R. 2013. A plan-based approach to strategic communication. In: Hewes, D.E. ed. *The cognitive bases of interpersonal communication*. New York, NY: Routledge. pp.141-180.

Bickenbach, J., Rubinelli, S., Baffone, C. & Stucki, G. 2023. The human functioning revolution: implications for health systems and sciences. *Frontiers in Science,* 1:1118512. https://doi.org/10.3389/fsci.2023.1118512

Boon, M. 2011. In defence of engineering sciences: the epistemological relations between science and technology. *Techne: Research in Philosophy & Technology*, 15(1):49-71. https://doi.org/10.5840/techne20111515

Boote, D.N. & Beile, P. 2005. Scholars before researchers: on the centrality of the dissertation literature review in research preparation. *Educational Researcher*, *34*(6):3-15. https://doi.org/10.3102/0013189x034006003

Braun, V. & Clarke, V. 2012. Thematic analysis. In: Cooper, H., Camic P.M., Long, D.L., Panter, A.T., Rindskopf, D. Sher, K.J. eds. *APA handbook of research methods*

Confidential - Company Proprietary

in psychology, Vol. 2. Research designs: quantitative, qualitative, neuropsychological, and biological. American Psychological Association. pp. 57-71. https://doi.org/10.1037/13620-004

Braun, V. & Clarke, V. 2022. Thematic analysis: A practical guide.

Brengarth, L.B. and Mujkic, E. 2016. WEB 2.0: How social media applications leverage nonprofit responses during a wildfire crisis. *Computers in Human Behavior*, *54*(1): 589-596. https://doi.org/10.1016/j.chb.2015.07.010

Brink, H., Van der Walt, C. & Van Rensburg, R.H. 2018. *Fundamentals of research methodology for health care professionals*. 4th edition. Cape Town: Juta.

Burns, N.A. & Grove, S.K. 2005. *Study guide for nursing research: conduct, critique, and utilisation*. Philadelphia, PA: Elsevier Saunders.

Burroughs, J.E. 2017. *Three factors leading to failed communications in emergency situations.* Minneapolis, MN: Walden University). (Thesis – PhD). https://scholarworks.waldenu.edu/cgi/viewcontent.cgi?article=4765&context=dissertations&httpsredir=1&referer=

Calfee, R.C. & Chambliss, M. 2005. The design of empirical research. In: Flood, J., Lapp, D., Squire, J.R., & Jensen, J., eds. *Methods of research on teaching the English language arts*. New York: Routledge. pp.53-88.

Caperon, L., Saville, F. & Ahern, S. 2022. Developing a socio-ecological model for community engagement in a health programme in an underserved urban area. *PloS one*, *17*(9):1-18.

Carter, N., Bryant-Lukosius, D., DiCenso, A., Blythe, J. & Neville, A.J. 2014. The use of triangulation in qualitative research. *Oncology Nursing Forum*, 41(5):545-547. https://www.ncbi.nlm.nih.gov/pubmed/25158659 10.1188/14.ONF.545-547

Cash, P., Isaksson, O., Maier, A. & Summers, J. 2022. Sampling in design research: eight key considerations. *Design studies,* 78:101077. https://doi.org/10.1016/j.destud.2021.101077

Confidential - Company Proprietary

Chanza, N., Siyongwana, P.Q., Williams-Bruinders, L., Gundu-Jakarasi, V., Mudavanhu, C., Sithole, V.B. & Manyani, A. 2020. Closing the gaps in disaster management and response: drawing on local experiences with Cyclone Idai in Chimanimani, Zimbabwe. *International Journal of Disaster Risk Science,* 11:655-666. https://doi.org/10.1007/s13753-020-00290-x

Christopher, L., Naicker, V. & Naidoo, N. 2023. Quality improvement in emergency medical services: shared experiences of South Africa with pre-war Ukraine. *Technology audit and production reserves*, *5*(4/73):37-44.

Chynoweth, S.K., Buscher, D., Martin, S. & Zwi, A.B. 2020. A social-ecological approach to understanding service utilisation barriers among male survivors of sexual violence in three refugee settings: a qualitative exploratory study. *Conflict and Health*, 14:43. https://doi.org/10.1186/s13031-020-00288-8

Collis, J. & Hussey, R. 2014. *Business research: a practical guide for undergraduate and postgraduate students*. 4th ed. London: Palgrave Macmillan.

Connelly, L.M. 2014. Use of theoretical frameworks in research. *Medsurg Nursing: Official Journal of the Academy of Medical-Surgical Nurses*, *23*(3):187-188.

Cresswell, J. 2013. *Qualitative inquiry & research design: choosing among five approaches*. 3rd ed. Thousand Oakes, California: SAGE.

Creswell, J.W. & Clark, V.L.P. 2017. *Designing and conducting mixed methods research*. California: SAGE.

Cypress, B.S. 2017. Rigour, reliability, and validity in qualitative research: perspectives, strategies, reconceptualisation, and recommendations. *Dimensions of Critical Care Nursing*, *36*(4):253-263. https://doi.org/10.1097/DCC.0000000000000253

Degenaar, A., Fourie, L. & Holtzhausen, L. 2022. A strategic integrated communication framework for child protection organisations in South Africa. *International Journal of Strategic Communication,* 16(5):700-721. https://doi.org/10.1080/1553118X.2022.2093204

Confidential - Company Proprietary

Dentoni, D., Pinkse, J. & Lubberink, R. 2021. Linking sustainable business models to socio-ecological resilience through cross-sector partnerships: A complex adaptive systems view. *Business & Society*, *60*(5):1216-1252.

Denzin, N.K. & Lincoln, Y.S. 2005. The Sage Handbook of Qualitative Research, 3rd ed. Thousand Oaks, CA: SAGE Publications.

Dixon, J., Burkholder, T., Pigoga, J., Lee, M., Moodley, K., de Vries, S., Wallis, L. & Mould-Millman, N.K., 2021. Using the South African Triage Scale for prehospital triage: a qualitative study. *BMC Emergency Medicine*, *21*(1):1-10.

Driouech, S., Sabir, E. & Bennis, M. 2020, June. D2D mobile relaying for efficient throughput-reliability delivering in 5G. In *ICC 2020-2020 IEEE International Conference on Communications (ICC)*. IEEE. pp. 1-7.

Drolet, M.-J., Rose-Derouin, E., Leblanc, J.-C., Ruest, M. & Williams-Jones, B. 2023. Ethical issues in research: perceptions of researchers, research ethics board members and research ethics experts. *Journal of Academic Ethics,* 21(2):269-292. https://doi.org/10.1007/s10805-022-09455-3

Evans, M. 2007. Recent research (2000–2006) into applied linguistics and language teaching with specific reference to L2 French. *Language Teaching*, *40*(3):211-230. https://doi.org/10.1017/S026144480700434X

Falkheimer, J. & Heide, M. 2018. *Strategic communication: an introduction to theory and global practice*. 2nd ed. New York, NY: Routledge.

Fan, L. and Hu, F.2018. Qualitative Study on Postoperative Self-identity in Patients with Temporary Ileostomy. *Journal of Nursing, 7*(1):1-1.

Fofana, F., Bazeley, P. & Regnault, A. 2020. Applying a mixed methods design to test saturation for qualitative data in health outcomes research. *PloS one*, *15*(6):1-12.

Fridell, M., Edwin, S., Von Schreeb, J. & Saulnier, D.D. 2020. Health system resilience: what are we talking about? A scoping review mapping characteristics and keywords. *International Journal of Health Policy and Management*, 9(1):6-16. https://www.ncbi.nlm.nih.gov/pubmed/31902190 10.15171/ijhpm.2019.71

Confidential - Company Proprietary

Frydenberg, K. & Brekke, M. 2012. Poor communication on patients' medication across health care levels leads to potentially harmful medication errors. *Scandinavian Journal of Primary Health Care,* 30(4):234-240. https://doi.org/10.3109/02813432.2012.712021

Fusch, P. & Ness, L. 2015. Are we there yet? Data saturation in qualitative research. *The Qualitative Report*, 20(9):1408-1416. https://doi.org/10.46743/2160-3715/2015.2281

Gausche-Hill, M., Krug, S. & Wright, J. 2021. Emergency medical services (EMS) 2050: a vision for the future of pediatric prehospital care. *Prehospital Emergency Care,* 25(1):91-94. https://doi.org/10.1080/10903127.2020.1734123

Gettel, C.J., Courtney, D.M., Janke, A.T., Rothenberg, C., Mills, A.M., Sun, W. & Venkatesh, A.K. 2022. The 2013 to 2019 emergency medicine workforce: clinician entry and attrition across the US geography. *Annals of Emergency Medicine,* 80(3):260-271. https://doi.org/10.1016/j.annemergmed.2022.04.031

Ghafouri, R. & Ofoghi, S. 2016. Trustworthy and rigor in qualitative research. *International Journal of Advanced Biotechnology and Research*, 7(4):1914-1922.

Gill, S.L. 2020. Qualitative sampling methods. *Journal of Human Lactation,* 36(4):579-581. https://doi.org/10.1177/0890334420949218

Golafshani, N. 2003. Understanding reliability and validity in qualitative research. *The Qualitative Report*, 8(4):597-607. https://doi.org/10.46743/2160-3715/2003.1870

Golladay, G.J. & Jain, R. 2022. Conflict of interest: full transparency. *Arthroplasty Today,* 13:208-209. https://doi.org/10.1016/j.artd.2022.01.019

Gormley, K., Alshehri, B., McCutcheon, K. & Prue, G. 2022. The use of information and communication technology between emergency medical teams in emergency situations: a systematic review. *Biology and Medicine,* 14(6):1-20.

Gottlieb, M. & Dyer, S. 2020. Information and disinformation: social media in the COVID-19 crisis. *Academic Emergency Medicine,* 27(7):640-641. https://doi.org/10.1111/acem.14036

Confidential - Company Proprietary

Grant, C. & Osanloo, A. 2014. Understanding, selecting, and integrating a theoretical framework in dissertation research: creating the blueprint for your “house”. *Administrative Issues Journal*, *4*(2):12-22.

Guba, E.G. 1981. Criteria for assessing the trustworthiness of naturalistic inquiries. *Educational Communication and Technology; A Journal of Theory, Research and Development (ECTJ)*, *29*(2):75-91. https://doi.org/10.1007/BF02766777

Guest, G., MacQueen, K.M. & Namey, E.E., 2012. *Applied thematic analysis*, *3*(20):1-21. Thousand Oaks, California: SAGE Publications.

Gupta, A. & Gupta, N. 2022. *Research methodology.* India: SBPD Publications.

Habibi-Soola, A., Mozaffari, N. & Mirzaei, A. 2022. Spiritual coping of emergency department nurses and emergency medical services staff during the COVID-19 pandemic in Iran: an exploratory study. *Journal of Religion and Health,* 61(2):1657-1670. https://doi.org/10.1007/s10943-022-01523-7

Harper, C.R., Steiner, R.J. and Brookmeyer, K.A. 2018. Using the social-ecological model to improve access to care for adolescents and young adults. *The Journal of Adolescent Health: Official Publication of the Society for Adolescent Medicine*, *62*(6):641-642. https://doi.org/10.1016/j.jadohealth.2018.03.010

Hayashi Jr, P., Abib, G., Hoppen, N. & Wolff, L.D.G. 2021. Processual validity in qualitative research in healthcare. *Inquiry: The Journal of Health Care Organization, Provision, and Financing*, *58*(1):1-8.

Hayward, S.E., Vanqa, N., Makanda, G., Tisile, P., Ngwatyu, L., Foster, I., Mcinziba, A., Biewer, A., Mbuyamba, R., Galloway, M. and Bunyula, S. 2024. “As a patient, I do not belong to the clinic; I belong to the community.” Co-developing a multi-level, person-centred tuberculosis stigma intervention in Cape Town, South Africa. Research Square.

Hendren, K., Newcomer, K., Pandey, S.K., Smith, M. & Sumner, N. 2023. How qualitative research methods can be leveraged to strengthen mixed methods research in public policy and public administration? *Public Administration Review, 83*(3):468-485.

Confidential - Company Proprietary

Higgins, E.T. 2022. The “communication game”: implications for social cognition and persuasion. In: Higgins, E.T., Herman, C.P. & Zanna, M.P. eds. *Social Cognition.* New York, NY: Routledge. pp. 343-392.

Hofstee, E. 2018. *Constructing a good dissertation*. Sandton: Epe.

Holman, B. & Wilholt, T. 2022. The new demarcation problem. *Studies in History and Philosophy of Science, 91*(1):211-220. https://doi.org/10.1016/j.shpsa.2021.11.011

Holtzhausen, D. & Zerfass, A., eds. 2014. *The Routledge handbook of strategic communication*. New York, NY: Routledge

Hornberger, B. & Rangu, S. 2020. *Designing inclusion and exclusion criteria*. Penn Libraries, University of Pennsylvania.

Howard, I., Cameron, P., Wallis, L., Castrén, M. & Lindström, V. 2020. Understanding quality systems in the South African prehospital emergency medical services: a multiple exploratory case study. *BMJ open quality*, *9*(2):1-13.

Hox, J.J. & Boeije, H.R., 2005. Data collection, primary vs. secondary. *Encyclopedia of Social Measurement*, 1(1), pp.593-599. https://doi.org/10.1016/B0-12-369398-5/00041-4

Hu, D., Zhou, S., Crowley-McHattan, Z.J. & Liu, Z., 2021. Factors that influence participation in physical activity in school-aged children and adolescents: a systematic review from the social-ecological model perspective. *International journal of environmental research and public health*, *18*(6):1-22.

Irwin, B.R., Hoxha, K. & Grépin, K.A. 2020. Conceptualising the effect of access to electricity on health in low-and middle-income countries: A systematic review. *Global public health*, *15*(3):452-473.

Jackson, K. & Bazeley, P. 2019. *Qualitative data analysis with NVivo.* 3rd ed. London: SAGE.

Jacobson, C.L., Basnet, S., Bhatt, A., Parajuli, S. & Shrestha, S.K. 2021. Emergency medical dispatcher training as a strategy to improve pre-hospital care in low-and

Confidential - Company Proprietary

middle-income countries: the case study of Nepal. *International Journal of Emergency Medicine,* 14(1):28. https://doi.org/10.1186/s12245-021-00355-8

James, K.E. 2023. Doing ethnographic research in the Fiji islands: research method and research ethics issues. *Cultural Studies↔ Critical Methodologies,* 23(4):331-340. https://doi.org/10.1177/15327086231172226

Jejaw, M., Debie, A., Yazachew, L. & Teshale, G. 2023. Comprehensive emergency management of obstetric and newborn care program implementation at University of Gondar Comprehensive Specialized Hospital, Northwest Ethiopia, 2021: an evaluation study. *Reproductive Health,* 20(1):76. https://doi.org/10.1186/s12978-023-01623-x

Jenkins, E.K., Slemon, A., Haines-Saah, R.J. & Oliffe, J. 2018. A guide to multisite qualitative analysis. *Qualitative health research*, *28*(12):1969-1977.

Johnson, M., O'Hara, R., Hirst, E., Weyman, A., Turner, J., Mason, S., Quinn, T., Shewan, J. & Siriwardena, A.N. 2017. Multiple triangulation and collaborative research using qualitative methods to explore decision making in pre-hospital emergency care. *BMC Medical Research Methodology,* 17:1-11. https://doi.org/10.1186/s12874-017-0290-z

Joseph, A., Chalil Madathil, K., Jafarifiroozabadi, R., Rogers, H., Mihandoust, S., Khasawneh, A., McNeese, N., Holmstedt, C. & McElligott, J.T. 2022. Communication and teamwork during telemedicine-enabled stroke care in an ambulance. *Human Factors,* 64(1):21-41. https://doi.org/10.1177/0018720821995687

Jost, J.T. 2020. *A theory of system justification*. Cambridge, MA, US: Harvard University Press.

Kalid, N., Zaidan, A., Zaidan, B., Salman, O.H., Hashim, M. & Muzammil, H. 2018. Based real time remote health monitoring systems: a review on patients prioritisation and related" big data" using body sensors information and communication technology. *Journal of Medical Systems,* 42:1-30. https://doi.org/10.1007/s10916-017-0883-4

Confidential - Company Proprietary

Katz, M. & Nandi, N. 2021. Social media and medical education in the context of the COVID-19 pandemic: scoping review. *JMIR Medical Education,* 7(2): e25892. https://doi.org/10.2196/25892

Khaketla, M., Carr, T., Dubuka, N., Quinn, B., Reeder, B., Sarker, K., Addae, A., Ali, A., Groot, G. & Sari, N. 2022. Community and public health responses to a COVID-19 outbreak in North-west Saskatchewan: challenges, successes, and lessons learned. *International Journal of Indigenous Health,* 17(1). https://doi.org/10.32799/ijih.v17i1.36703

Khan, Y., O'Sullivan, T., Brown, A., Tracey, S., Gibson, J., Généreux, M., Henry, B. & Schwartz, B. 2018. Public health emergency preparedness: a framework to promote resilience. *BMC public health,* 18:1-16. https://doi.org/10.1186/s12889-018-6250-7

Kilanowski, J.F. 2017. Breadth of the socio-ecological model. *Journal of Agromedicine,* 22(4):295-297. https://doi.org/10.1080/1059924X.2017.1358971

Kim, K. & Oh, B. 2023. Prehospital triage in emergency medical services system: a scoping review. *International Emergency Nursing,* 69:101293. https://doi.org/10.1016/j.ienj.2023.101293

Kimmich, C., Baldwin, E., Kellner, E., Oberlack, C. and Villamayor-Tomas, S., 2023. Networks of action situations: a systematic review of empirical research. *Sustainability Science*, *18*(1):11-26. https://doi.org/10.1007/s11625-022-01121-2

King, B.J., Gilmore-Bykovskyi, A.L., Roiland, R.A., Polnaszek, B.E., Bowers, B.J. & Kind, A.J. 2013. The consequences of poor communication during transitions from hospital to skilled nursing facility: a qualitative study. *Journal of the American Geriatrics Society,* 61(7):1095-1102. https://doi.org/10.1111/jgs.12328

Kroll, A., Remington, C.L., Awasthi, P. & Ganapati, N.E. 2021. Mitigating the negative effects of emotional labour: a study of disaster response and recovery workers after the 2010 Haiti earthquake. *Governance,* 34(1):87-106. https://doi.org/10.1111/gove.12476

Confidential - Company Proprietary

Kuczynski, L. & Daly, K. 2003. Qualitative methods for inductive (theory-generating) research: psychological and sociological approaches. In: Kuczynski, L., ed. *Handbook of Dynamics in Parent-Child Relations*. Thousand Oaks, CA: SAGE Publications. pp. 373-392.

Kumar, R. 2018. *Research Methodology, a step-by-step guide for beginners*. 5th ed. London: SAGE.

Latham, G.P. (2007). *Work motivation: history, theory, research, and practice*. Thousand Oaks: SAGE Publications.

Lauridsen, K.G., Løfgren, B., Brogaard, L., Paltved, C., Hvidman, L. & Krogh, K. 2022. Cardiopulmonary resuscitation training for healthcare professionals: a scoping review. *Simulation in Healthcare,* 17(3):170-182. https://doi.org/10.1097/SIH.0000000000000608

Levesque, J.F., Harris, M.F. & Russell, G. 2013. Patient-centred access to health care: conceptualising access at the interface of health systems and populations. *International Journal for Equity in Health*, *12*(1):1-9. https://doi.org/10.1186/1475-9276-12-18

Li, Y., Li, Z., Li, C., Cai, W., Liu, T., Li, J., Fan, H. and Cao, C. 2023. Out-of-hospital cardiac arrest: A data-driven visualisation of collaboration, frontier identification, and future trends. *Medicine*, *102*(33):1-10.

Liehr, P. & Smith, M.J.1999. Middle range theory: spinning research and practice to create knowledge for the new millennium. *Advances in Nursing Science*, *21*(4):81-91. https://doi.org/10.1097/00012272-199906000-00011

Lincoln, Y.S. & Guba, E.G. 1985. *Naturalistic Inquiry*. London: SAGE Publications.

Liu, X., Wang, X., Wu, Y., Yu, H., Yang, M., Khoshnood, K., Luo, E. & Wang, X. 2023. Knowledge and attitudes of Chinese medical postgraduates toward research ethics and research ethics committees: a cross-sectional study. *BMC Medical Education,* 23(1):482. https://doi.org/10.1186/s12909-023-04459-y

Ma, P.H.X., Chan, Z.C.Y. & Loke, A.Y. 2017. The socio-ecological model approach to understanding barriers and facilitators to the accessing of health services by sex

Confidential - Company Proprietary

workers: a systematic review. *AIDS and Behavior,* 21(8):2412-2438. https://doi.org/10.1007/s10461-017-1818-2

MacLeod, M., 2018. What makes interdisciplinarity difficult? Some consequences of domain specificity in interdisciplinary practice. *Synthese*, 195(2):697-720. https://doi.org/10.1007/s11229-016-1236-4

Mahmudiono, T., Segalita, C. & Rosenkranz, R.R. 2019. Socio-ecological model of correlates of double burden of malnutrition in developing countries: A narrative review. *International Journal of Environmental Research and Public Health*, *16*(19):1-23.

Malatjie, D.N. 2023. Performance management: a case study of the emergency medical and response services in Limpopo province. Durban: Durban University of Technology. (Thesis – PhD). https://openscholar.dut.ac.za/bitstream/10321/4842/3/Malatjie_D_2023.pdf

Mametja, S., Letshweni, M., Semenya, M., Moyo, B., Whyte, C., Bultinck-Human, J. and Moloabi, S. 2023. Perspective Chapter: Financing Private Healthcare for Government Employees to Improve Access. In *Health Insurance Across Worldwide Health Systems*. IntechOpen.

Maphumulo, W.T. & Bhengu, B.R., 2019. Challenges of quality improvement in the healthcare of South Africa post-apartheid: A critical review. *Curationis*, *42*(1):1-9.

Mbanaso, U.M., Abrahams, L. & Okafor, K.C. 2023. Research philosophy, design and methodology. In: Mbanaso, U.M., Abrahams, L. & Okafor, K.C. eds. *Research techniques for computer science, information systems and cybersecurity*. New York, NY: Springer. https://doi.org/10.1007/978-3-031-30031-8_6

McAlpine, D.J., Hodkinson, P. & Fleming, J. 2020. Pre-hospital over-triage and potential contributing factors in Cape Town, South Africa. *South African Journal of Pre-hospital Emergency Care*, *1*(2):6-12.

Mchunu, G.G., Harris, O. & Nxumalo, C.T. 2022. Exploring primary healthcare practitioners' experiences regarding the coronavirus disease 2019 (COVID-19)

Confidential - Company Proprietary

pandemic in KwaZulu-Natal, South Africa. *Primary health care research & development*, *23*(1):1-13.

McKay, S., Lannegrand, L., Skues, J. & Wise, L. 2022. Identity development during student exchange: A qualitative study of students' perspectives on the processes of change. *Emerging Adulthood*, *10*(2):420-433.

McLeroy, K.R., Bibeau, D., Steckler, A. & Glanz, K. 1988. An ecological perspective on health promotion programs. *Health Education Quarterly*, *15*(4):351-377. https://doi.org/10.1177/109019818801500401

Mechili, E.A., Saliaj, A., Xhindoli, J., Bucaj, J., Sifaki-Pistolla, D., Peto, E., Zahaj, M. and Chatzea, V.E. 2022. Primary healthcare personnel challenges and barriers on the management of patients with multimorbidity in Albania. *Health & Social Care in the Community*, *30*(1):380-388.

Meisel, Z.F., Shea, J.A., Peacock, N.J., Dickinson, E.T., Paciotti, B., Bhatia, R., Buharin, E. & Cannuscio, C.C. 2015. Optimising the patient handoff between emergency medical services and the emergency department. *Annals of Emergency Medicine,* 65(3):310-317. https://doi.org/10.1016/j.annemergmed.2014.07.003

Merchant, R.M., South, E.C. & Lurie, N. 2021. Public health messaging in an era of social media. *JAMA,* 325(3):223-224. https://doi.org/10.1001/jama.2020.24514

Mey, G. 2022. Qualitative methodology. In: Zumbach, J., Bernstein, D., Narciss, S. Marsico, G. eds. *International handbook of psychology learning and teaching: Springer International Handbooks of Education*. New York, NY: Springer. pp. 1-26.

Mezmir, E.A. 2020. Qualitative data analysis: an overview of data reduction, data display, and interpretation. *Research on Humanities and Social Sciences,* 10(21):15-27. https://iiste.org/Journals/index.php/RHSS/article/viewFile/54898/56707

Mishra, S.B. & Alok, S. 2022. *Handbook of research methodology*. New Delhi, India: Educreation Publishing.

Mogharab, V., Ostovar, M., Ruszkowski, J., Hussain, S.Z.M., Shrestha, R., Yaqoob, U., Aryanpoor, P., Nikkhoo, A.M., Heidari, P., Jahromi, A.R. Rayatdoost, E., Ali, A., Javdani, F., Farzaneh, R., Ghanaatpisheh, A., Habibzadeh, S. R., Foroughian, M.,

Confidential - Company Proprietary

Ahmadi, S. R., Akhavan, R., Abbasi, B., Shahi, B., Hakemi, A., Bolvardi, E., Bagherian, F., Motamed, M., Boroujeni, S. T., Jamalnia, S., Mangouri, A., Paydar, M., Mehrasa, N., Shirali, D., Sanmarchi, F., Saeed, A., Jafari, N. A., Babou, A., Kalani, N. & Hatami, N. 2022. Global burden of the COVID-19 associated patient-related delay in emergency healthcare: a panel of systematic review and meta-analyses. *Globalisation and Health,* 18(1):58. https://doi.org/10.1186/s12992-022-00836-2

Mohd Arifin, S.R. 2018. Ethical considerations in qualitative study. *International Journal of Care Scholars*, 1(2):30-33. https://doi.org/10.31436/ijcs.v1i2.82

Mohsin, K.F., Ahsan, M.N. & Haider, M.Z. 2024. Understanding variation in catastrophic health expenditure from socio-ecological aspect: a systematic review. *BMC Public Health*, *24*(1):1-24.

Mohulatsi, M.Z., Garutsa, T.C. & Bahule, B. 2023. The experiences of expectant and new mothers in accessing maternal healthcare services during the COVID-19 pandemic in Mmabatho, North-West, South Africa. *Social Sciences,* 12(7):381. https://doi.org/10.3390/socsci12070381

Möller, A., Hunter, L., Kurland, L. & van Hoving, D.J. 2018. The association between hospital arrival time, transport method, prehospital time intervals, and in-hospital mortality in trauma patients presenting to Khayelitsha Hospital, Cape Town. *African Journal of Emergency Medicine*, *8*(3);89-94.

Møller, T.P., Jensen, H.G., Viereck, S., Lippert, F. & Østergaaard, D. 2021. Medical dispatchers' perception of the interaction with the caller during emergency calls-a qualitative study. *Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine,* 29:1-10. https://doi.org/10.1186/s13049-021-00860-y

Morse, J.M. & Field, P.A. 1995. *Qualitative research methods for health professionals*. SAGE Publications.

Mould-Millman, N.K., Dixon, J.M., Burkholder, T., Pigoga, J.L., Lee, M., de Vries, S., Moodley, K., Meier, M., Colborn, K., Patel, C. & Wallis, L.A. 2021. Validity and reliability of the South African Triage Scale in prehospital providers. *BMC Emergency Medicine*, *21*(1):1-9.

Confidential - Company Proprietary

Mundey, P., Dopp, A.R., Slemaker, A., Beasley, L.O., Silovsky, J.F. & Eisenberg, D., 2023. Qualitative economic evaluation of psychosocial interventions: How looking beyond the numbers helps illuminate programmatic costs and benefits. *Qualitative Psychology*, *10*(1):16-29.

Nagashima, K. & Yasuda, N. 2021. Study on description of plant status at Fukushima accident by emergency action level. *Journal of Nuclear Engineering and Radiation Science (ASME),* 7(1):011701. https://doi.org/10.1115/1.4046841

Nehme, Z., Andrew, E. & Smith, K. 2016. Factors influencing the timeliness of emergency medical service response to time critical emergencies. *Prehospital Emergency Care,* 20(6):783-791. https://doi.org/10.3109/10903127.2016.1164776

Newcomer, K.E., Hatry, H.P. & Wholey, J.S. eds. 2015. *Handbook of practical program evaluation*. San Francisco, CA: Jossey-Bass & Pfeiffer Imprints, Wiley.

Nhamo, G. & Chikodzi, D. 2021. Ethical and human rights dilemmas during disasters: emerging findings from Tropical Cyclone Idai. In: Nhamo, G. & Chikodzi, D., eds. *Cyclones in Southern Africa: Volume 1: Interfacing the Catastrophic Impact of Cyclone Idai with SDGs in Zimbabwe*:187-203. Zurich, Switzerland: Springer Nature. https://doi.org/10.1007/978-3-030-72393-4_11

Nothhaft, H., Werder, K.P., Verčič, D. & Zerfass, A. 2018. Strategic Communication: Reflections on an elusive concept. *International Journal of Strategic Communication,* 12(4):352-366. https://doi.org/10.1080/1553118X.2018.1492412

Nothhaft, H., Werder, K.P., Verčič, D. & Zerfass, A. 2020. *Future directions of strategic communication.* New York: Routledge.

Nowell, L.S., Norris, J.M., White, D.E., & Moules, N.J. 2017. Thematic analysis: striving to meet the trustworthiness criteria. *International Journal of Qualitative Methods*, 16(1). https://doi.org/10.1177/1609406917733847

Ntsiea, M.V. 2019. Current stroke rehabilitation services and physiotherapy research in South Africa. *South African Journal of Physiotherapy*, *75*(1):1-10.

Confidential - Company Proprietary

Ntuli, M.N., Eloka-Eboka, A.C., Mwangi, F.M., Ewim, D.R.E. & Dioha, M.O. 2024. Energy sustainability and carbon dioxide emissions mitigation options for South Africa's road transport sector. *Bulletin of the National Research Centre*, *48*(1): 1-14.

Nyasulu, J. & Pandya, H. 2020. The effects of coronavirus disease 2019 pandemic on the South African health system: A call to maintain essential health services. *African Journal of Primary Health Care and Family Medicine*, *12*(1):1-5.

Olatunji, G., Kokori, E., Aderinto, N. & Alsabri, M.A.H. 2024. Emergency airway management in resource-limited settings. *International Journal of Emergency Medicine*, *17*(1), p.41.

Pajo, B. 2022. *Introduction to research methods: a hands-on approach*. 2nd ed. Los Angeles, US: SAGE publications.

Pakdaman, M., Askari, R., Dehghan, A., Pahlavanpoor, S. & Nikafshan, A. 2023. Evaluation of the consequences and costs of the Anglo-American system in the pre-hospital emergency department of Yazd in 2018. *Evidence Based Health Policy, Management and Economics*, 7:51-58. https://doi.org/10.18502/jebhpme.v7i1.12354

Pathiranage, Y.L., Jayatilake, L.V. & Abeysekera, R. 2020. Case study research design for exploration of organisational culture towards corporate performance. *Review of International Comparative Management,* 21(3):361-372. https://doi.org/10.24818/RMCI.2020.3.361

Patiño, A.M., Chen, J., DeVos, E.L., Lee, J.A., Anderson, K., Banks, M., Herard, K., Kharel, R., Kivlehan, S. & Arbelaez, C. 2022. Emergency medicine around the world: analysis of the 2019 American College of emergency physicians international Ambassador country reports. *Journal of the American College of Emergency Physicians Open,* 3(2):e12681. https://doi.org/10.1002/emp2.12681

Patiño, C.M. & Ferreira, J.C. 2018. Inclusion and exclusion criteria in research studies: definitions and why they matter. *Journal Brasileiro de Pneumologia*, 44(1).84-84. https://doi.org/10.1590/s1806-37562018000000088

Confidential - Company Proprietary

Patton, M.Q. 1999. Enhancing the quality and credibility of qualitative analysis. *Health Services Research*, 34(5 Pt 2):1189-1208. https://www.ncbi.nlm.nih.gov/pubmed/10591279

PBEC (Professional Board for Emergency Care). 2018. *Clinical practice guidelines*. Pretoria: Health Professions Council of South Africa. https://www.hpcsa.co.za/Content/upload/professional_boards/emb/guidelines/CLINICAL_PRACTICE_GUIDELINES_PROTOCOLS_JULY_2018.pdf Date of access: 18 Oct. 2024.

Pettke, A., Stassen, W., Laflamme, L., Wallis, L.A. & Hasselberg, M. 2023. Changes in trauma-related emergency medical services during the COVID-19 lockdown in the Western Cape, South Africa. *BMC Emergency Medicine*, *23*(1):1-9.

Philip, L.J. 1998. Combining quantitative and qualitative approaches to social research in human geography—an impossible mixture? *Environment and Planning A: Economy and Space*, 30(2):261-276. https://doi.org/10.1068/a300261

Pollock, J.R., Bollig, T.R., Haglin, J.M., Sandefur, B.J., Rappaport, D.E. & Lindor, R.A. 2020. Medicare reimbursement to physicians decreased for common emergency medicine services from 2000 to 2020. *Annals of Emergency Medicine,* 76(5):615-620. https://doi.org/10.1016/j.annemergmed.2020.06.017

Rahman, M.M. 2023. Sample size determination for survey research and non-probability sampling techniques: a review and set of recommendations. *Journal of Entrepreneurship, Business and Economics,* 11(1):42-62.

Ramlagan, S., Sewpaul, R., Shean, Y., Schmidt, T., North, A. & Reddy, S.P., 2024. Psychological distress among South African healthcare workers during the COVID-19 pandemic. *Curationis*, *47*(1):1-12.

Rapanyane, M.B. 2022. The Dire Shortage of Ambulances in the South African Healthcare System: Unblurring Implications on the Right to Health. *African Journal of Development Studies*, *12*(3):61-81. https://doi.org/10.31920/2634-3649/2022/v12n3a4

Confidential - Company Proprietary

Reiss, M., Kraus, M., Riedel, M. & Czypionka, T. 2024. What makes health systems resilient? An analytical framework drawing on European learnings from the COVID-19 pandemic based on a multitiered approach. *BMJ Public Health*, 2(1):e000378. https://bmjpublichealthsite-bmj.vercel.app/content/2/1/e000378 10.1136/bmjph-2023-000378

Rocco, T.S. & Plakhotnik, M.S. 2009. Literature reviews, conceptual frameworks, and theoretical frameworks: terms, functions, and distinctions. *Human Resource Development Review*, *8*(1):120-130. https://doi.org/10.1177/1534484309332617

Rowland, M. & Adefuye, A.O. 2021. Factors That Influence Human Error and Patient Safety in the Pre-hospital Emergency Care Setting: Perspectives of Emergency Care Practitioners in a Middle-income Country. https://web.archive.org/web/20210912012054id_/https://assets.researchsquare.com/files/rs-850377/v1/c049f239-f81e-4811-a599-3d949bfefdb6.pdf?c=1630684443. Date of Access: 18 January 2025.

Rowland, M. and Adefuye, A.O., 2022. An Evaluation of Pre-Hospital Emergency Care Personnel Knowledge About Crisis Resource Management and Perspectives of Educators About Inclusion of Crisis Resource Management in the Pre-Hospital Emergency Care Curriculum. *Advances in Medical Education and Practice*, *13*(1):1-16.

SADoH (South African Department of Health). 2017. *National emergency care education and training policy*. https://www.hpcsa-blogs.co.za/wp-content/uploads/2018/08/national-emergency-care-education-and-train ing-policy.pdf. Date of access: 18 October 2024.

Saikia, R. 2024. *Bridging worlds: a guide to qualitative methodologies and theories*. https://www.linkedin.com/pulse/bridging-worlds-guide-qualitative-methodologies-theories-saikia-l3ikf/ Date of Access: 13 October 2024.

Salam, M.A. & Khan, S.A. 2020. Lessons from the humanitarian disaster logistics management: a case study of the earthquake in Haiti. *Benchmarking: An International Journal,* 27(4):1455-1473. https://doi.org/10.1108/BIJ-04-2019-0165

Confidential - Company Proprietary

Sandelowski, M. 2000. Whatever happened to qualitative description? *Research in Nursing & Health,* 23(4):334-340. https://doi.org/10.1002/1098-240x(200008)23:4<334::aid-nur9>3.0.co;2-g

Saunders, B., Sim, J., Kingstone, T., Baker, S., Waterfield, J., Bartlam, B., Burroughs, H., Jinks, C. 2018. Saturation in qualitative research: exploring its conceptualisation and operationalisation. *Quality & Quantity*, 52(4):1893-1907. https://www.ncbi.nlm.nih.gov/pubmed/29937585 10.1007/s11135-017-0574-8

Saunders, M.N. & Townsend, K. 2016. Reporting and justifying the number of interview participants in organisation and workplace research. *British Journal of Management*, 27(4):836-852.

Schmeitz, C.T., Barten, D.G., Van Barneveld, K.W., De Cauwer, H., Mortelmans, L., Van Osch, F., Wijnands, J., Tan, E.C. & Boin, A. 2022. Terrorist attacks against emergency medical services: secondary attacks are an emerging risk. *Prehospital and Disaster Medicine,* 37(2):185-191. https://doi.org/10.1017/S1049023X22000140

Sell, L., Brandes, B., Brandes, M., Zeeb, H. & Busse, H., 2024. Determinants promoting and hindering physical activity in primary school children in Germany: a qualitative study with students, teachers and parents. *Frontiers in Public Health*, *12*(1):1-11

Senkamalavalli, R., Basavaraddi, C.C.S., Livingston, L.M., Latha, N. & Reddy, E.G. 2023. Smart personal protective equipment in ambulance services with IoT integration for safety. *Conference proceedings*. Second International Conference on Smart Technologies for Smart Nation (SmartTechCon), Singapore. Singapore, 2023. pp. 526-530. https://doi.org/10.1109/SmartTechCon57526.2023.10391762

Sheng, J., Liu, S., Huang, T. & Wu, Y., 2022. Overlapping Coalition Game for Resource Allocation in Many-to-Many D2D Communication. *Wireless Communications and Mobile Computing*, *2022*(1):1-12.

Shittu, E., Parker, G. & Mock, N. 2018. Improving communication resilience for effective disaster relief operations. *Environment Systems and Decisions,* 38(3): 379-397. https://doi.org/10.1007/s10669-018-9694-5

Confidential - Company Proprietary

Siedlecki, S.L. 2020. Understanding descriptive research designs and methods. *Clinical Nurse Specialist,* 34(1):8-12. https://doi.org/10.1097/NUR.0000000000000493

Sobuwa, S. 2020. SAJPEC: A new dawn for pre-hospital emergency care in South Africa. *South African Journal of Pre-Hospital Emergency Care*, *1*(1):2-2.

Sobuwa, S. Christopher, L.D. 2019. Emergency care education in South Africa: past, present and future. *Australasian Journal of Paramedicine*, *16*(1):1-5.

Sofaer, S. 1999. Qualitative methods: what are they and why use them? *Health Services Research*, 34(5 Pt 2):1101-1118. https://www.ncbi.nlm.nih.gov/pubmed/10591275

Sommer, A., Rehbock, C., Vos, C., Borgs, C., Chevalier, S., Doreleijers, S., Gontariuk, M., Hennau, S., Pilot, E. & Schröder, H. 2022. Impacts and lessons learned of the first three COVID-19 waves on cross-border collaboration in the field of emergency medical services and interhospital transports in the Euregio-Meuse-Rhine: a qualitative review of expert opinions. *Frontiers in Public Health,* 10:841013. https://doi.org/10.3389/fpubh.2022.841013

Speight, C., Caiola, C., Tyndall, D.E. & Scott, E.S. 2023. Barriers and facilitators to nurse practitioner buprenorphine prescribing for opioid use disorder in primary care settings. *Journal of the American Association of Nurse Practitioners*, *35*(2):112-121.

Stassen, W., Wylie, C., Djärv, T. & Wallis, L.A. 2021. Out-of-hospital cardiac arrests in the city of Cape Town, South Africa: a retrospective, descriptive analysis of prehospital patient records. *BMJ Open*, *11*(8):1-7.

Stratton, S.J. 2021. Population research: convenience sampling strategies. *Prehospital and Disaster Medicine,* 36(4):373-374. https://doi.org/10.1017/S1049023X21000649

Suri, H. 2011. Purposeful sampling in qualitative research synthesis. *Qualitative Research Journal,* 11(2):63-75. https://doi.org/10.3316/QRJ1102063

Suri, H. 2020. Ethical considerations of conducting systematic reviews in educational research. In: Zawacki-Richter, O., Kerres, M., Bedenlier, S., Bond, M. & Buntins, K.

Confidential - Company Proprietary

eds. *Systematic reviews in educational research: methodology, perspectives and application*. Wiesbaden: Springer. pp. 41-54.

Taghadosi, M., Valiee, S. & Aghajani, M. 2021. Nursing faculty's point of view regarding noncompliance with ethics in academic environments: a qualitative study. *BMC Nursing*, *20*(1):1-10

Tambo, E., Fouad, A.M. & Khater, E.I. 2017. Strengthening community emergency preparedness and response to threats, epidemics, and disaster prevention and management in Saudi Arabia. *International Journal of Emergency Management,* 13(3):288-303.

Tatsuzaki, H., Kumagai, A., Fuma, S. & Yamashita, S. 2022. Reorganisation of advanced radiation emergency medicine systems in Japan after the Fukushima nuclear power plant accident. *Environmental Advances,* 8:100197. https://doi.org/10.1016/j.envadv.2022.100197

Theofanidis, D. & Fountouki, A. 2018. Limitations and delimitations in the research process. *Perioperative Nursing-Quarterly Scientific, Online Official Journal of GORNA*, *7*(3):155-163. https://doi.org/10.5281/zenodo.2552022

Thielmann, B., Schnell, J., Böckelmann, I. & Schumann, H. 2022. Analysis of work related factors, behavior, well-being outcome, and job satisfaction of workers of emergency medical service: a systematic review. *International Journal of Environmental Research and Public Health,* 19(11):6660. https://doi.org/10.3390/ijerph19116660

Tiwari, R., Naidoo, R., English, R. and Chikte, U. 2021. Estimating the emergency care workforce in South Africa. *African journal of primary health care & family medicine*, *13*(1):1-9.

Townsend, N. & Foster, C. 2013. Developing and applying a socio-ecological model to the promotion of healthy eating in the school. *Public Health Nutrition,* 16(6):1101-1108. https://doi.org/10.1017/S136898001100265

Trochim, W. & Donnelly, J.P. 2008. *The research methods knowledge base*. Mason, OH: Cengage Learning.

Confidential - Company Proprietary

Tsujiguchi, T., Sakamoto, M., Koiwa, T., Suzuki, Y., Ogura, K., Ito, K., Yamanouchi, K. & Kashiwakura, I. 2020. A simple survey of the preparation situation for resident's evacuation in Japanese prefectures after the Fukushima Daiichi nuclear power plant accident. *Frontiers in Public Health,* 8:496716. https://doi.org/10.3389/fpubh.2020.496716

Tuite, D. 2012. *Electronic Design: Can public-safety radio's P25 survive LTE?* https://www.electronicdesign.com/technologies/analog/article/21794911/can-public-safety-radios-p25-survive-lte Date of access: 11 Nov. 2024.

Turner, J.R., Baker, R. and Kellner, F. 2018. Theoretical literature review: Tracing the life cycle of a theory and its verified and falsified statements. *Human Resource Development Review*, *17*(1):34-61. https://doi.org/10.1177/1534484317749680

Vaismoradi, M., Turunen, H. & Bondas, T. 2013. Content analysis and thematic analysis: implications for conducting a qualitative descriptive study. *Nursing & Health Sciences*, 15(3):398-405. https://doi.org/10.1111/nhs.12048

Van Boom, W.H., Desmet, P. and Mascini, P. eds. 2018. *Empirical legal research in action: reflections on methods and their applications*. Northampton, MA: Edward Elgar Publishing.

Van Wyk, B. 2012. *Research design and methods Part 1 [PowerPoint presentation].* Post-graduate enrolment and throughput. The University of Western Cape. https://www.academia.edu/22628859/Research_design_and_methods_Part_I Date of access: 11 Nov. 2024.

Venter, E.R. & Van Eck, L. 2021. Research on extended external reporting assurance: trends, themes, and opportunities. *Journal of International Financial Management & Accounting*, *32*(1):63-103. https://doi.org/10.1111/jifm.12125

Vugts, A., van Den Hoven, M., De Vet, E. & Verweij, M. 2020. How autonomy is understood in discussions on the ethics of nudging. *Behavioural Public Policy,* 4(1):108-123. https://doi.org/10.1017/bpp.2018.5

Wang, W. & Luo, L. 2020. Systematic review of action research in management information systems field. *The International Journal of Academic Research in*

Confidential - Company Proprietary

Business and Social Sciences, 10(6):104-117. https://doi.org/10.6007/IJARBSS/v10-i6/7267

Watanabe, K., Sakai, R., Tanaka, S., Nagata, M., Osaka, H., Nakamura, A., Wu, I., Matsumoto, Y. & Gotoh, K. 2024. Electromagnetic Interference With the Mobile Communication Devices in Unmanned Aerial Vehicles and Its Countermeasures. *IEEE Access, 12*(1):11642-11652.

Werder, K.P., Nothhaft, H., Verčič, D. & Zerfass, A. 2018. Strategic communication as an emerging interdisciplinary paradigm. *International Journal of Strategic Communication,* 12(4):333-351. https://doi.org/10.1080/1553118X.2018.1494181

Werder, K.P., Nothhaft, H., Verčič, D. & Zerfass, A. 2020. Strategic communication as an emerging interdisciplinary paradigm. In: Nothhaft, H., Werder, K.P., Verčič, D. & Zerfass, A. eds. *Future directions of strategic communication.* London: Routledge. pp. 1-19.

WHO (World Health Organization). 2020. *HeRAMS annual report, 2020*. https://www.who.int/publications/m/item/herams-annual-report-2020 Date of access: 15 Nov. 2024.

WHO (World Health Organization). 2022. *Health systems resilience toolkit. Geneva, Switserland*. https://iris.who.int/bitstream/handle/10665/354177/9789240048751-eng.pdf Date of access: 10 Nov. 2024.

Wiid, J. & Diggines, C. 2013. *Marketing research.* Cape Town: Juta & Company Limited.

Winkler, P. & Etter, M. 2018. Strategic communication and emergence: a dual narrative framework. *International Journal of Strategic Communication,* 12(4):382-398. https://doi.org/10.1080/1553118X.2018.1452241

Wong, L.P., 2008. Focus group discussion: a tool for health and medical research. *Singapore Medical Journal*, 49(3):256-260.

Wright, C.E. 2023. Methods matter: learning from institutional ethnography and intersectionality to inform interview research methods for social justice in STEM

Confidential - Company Proprietary

education. *Journal of Women and Minorities in Science and Engineering,* 29(4):1-27. https://doi.org/10.1615/JWomenMinorScienEng.2022043390

Wu, T.-C. & Ho, C.-T.B. 2022. A scoping review of metaverse in emergency medicine. *Australasian Emergency Care*. https://doi.org/10.1016/j.auec.2022.08.002

You, I., Choo, K.-K.R. & Ho, C.-L. 2018. A smartphone-based wearable sensors for monitoring real-time physiological data. *Computers & Electrical Engineering,* 65:376-392. https://doi.org/10.1016/j.compeleceng.2017.06.031

Yu, C.C., Tan, L., Le, M.K., Tang, B., Liaw, S.Y., Tierney, T., Ho, Y.Y., Lim, B.E.E., Lim, D., Ng, R., Chia, S.C. & Low, J.A. 2022. The development of empathy in the healthcare setting: a qualitative approach. *BMC Medical Education,* 22(1):245. https://doi.org/10.1186/s12909-022-03312-y

Zaidi, A.A., Dixon, J., Lopez, K., De Vries, S., Wallis, L.A., Ginde, A. & Mould-Millman, N.K. 2019. The burden of trauma at a district hospital in the Western Cape Province of South Africa. *African journal of emergency medicine*, *9*(1):14-20.

Zerfass, A., Verčič, D., Nothhaft, H. & Werder, K.P. 2020. Strategic communication: defining the field and its contribution to research and practice. In: Nothhaft, H., Werder, K.P., Verčič, D. & Zerfass, A. eds*. Future directions of strategic communication.* New York, NY: Routledge. https://doi.org/10.1080/1553118X.2018.1493485

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APPENDICES

Appendix A: Informed Consent Form

DEAR PARTICIPANT

INFORMED CONSENT LETTER TO INTERVIEW PARTICIPANTS

You are invited to participate in a research study analysing the strategic communication of Emergency Medical Services (EMS) in the North West province that forms part of a Master of Business Administration (MBA) degree. This study aims to understand the challenges of EMS communication and provide recommendations to the North West Department of Health for improving emergency service delivery.

Please spend some time reading this material to learn more about the specifics of the research. If you do not entirely understand any aspect of this study that you do not wholly understand, kindly ask the researcher or the person describing it to you. You must be completely confident in your understanding of the nature of this study and the potential ways you could participate. Additionally, your involvement is optional, and you can decline. Saying no will not have any adverse effects on you in the slightest. Even if you agree to participate in the research immediately, you can withdraw anytime.

This study has been approved by the NWU Economic and Management Sciences Research Ethics Committee (EMSREC). It will be conducted according to the ethical guidelines and principles of the North-West University and other international ethical guidelines applicable to this study.

Title of the project: An Analysis of the Strategic Communication of EMS within the North West Province

Institution: NWU Business School

Ethics Reference Number: 0-1972-23-A4

Names and contact details of project staff.

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Supervisor		Student
Title, name & surname	Dr Christi Niesing	Mr Mohau Thamae
Function in Project	Principal Investigator	Researcher
Telephone	082 571 6865	

What is this research study all about?

To analyse strategic communication of the Emergency Medical Services (EMS) within the North West province

- Interviews will be conducted with the EMS personnel and community members to establish the challenges they face with
- To draw a comprehensive report to the North West Department of Health to explore their insights and understanding regarding the communication strategy regarding EMS within the North West Province.

Why have you been invited to participate?

You have been invited to participate in this research study because you fall into at least one of the following categories:

- Health care worker

What will be expected of you?

You will be expected to:

- Participate in a 30-to-45-minute semi-structured interview with the researcher at a suitable time and in a private area without interruptions that is convenient for both parties. The researcher will schedule this once the NWU ethics committee approves this.
- Respond to the questions openly and honestly.

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- Inform the supervisor should you feel or experience any discomfort or distress during the research process and inform the supervisor if you sometimes feel the need to terminate your involvement in the research process.

Will you gain anything from taking part in this research?

You will not be paid to participate in this study. There are no costs to you except your time. This research study intends to give you a voice to reveal, explain and reflect on the strategic communication regarding EMS in the North West Province and how the situation can be improved. No monetary reward shall be made available for participation in the study. You will, however, be furnished with a communique on the study outcomes.

Are there risks involved in participating in this research, and what will be done to prevent them?

Your information will remain confidential. Participation in this study does not create any physical risk to you, as the study does not involve any physical activities or experiments. However, we have identified certain ethical principles that shall always be maintained to prevent any damage to you. These principles will focus on protecting your dignity and keeping all records provided private and confidential.

How will we protect your confidentiality, and who will see your findings?

You will be assigned a unique participant ID. Our interview will be recorded and saved concerning the ID. Still, data collected shall be confidential and not be shared with any third party not directly involved in the research process. Personal details of participants and their direct input to the research study shall not be made public. All research records shall be kept for a retention period and destroyed by an appropriate means. The study's findings will be made public; however, they will not contain any raw data that might incriminate specific individuals. The anonymity of the conclusions will be protected by following the research protocol. The participant's identity will be replaced by pseudo or code names, saved under strict security measures with encrypted passwords. This protects and ensures that the participant's personal information is secured, according to the Protection of Personal Information Act (POPIA).

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What will happen with the findings or samples?

The findings concluded in the study will be used for academic purposes and will only add to the current body of knowledge. Data will be securely stored and only accessed by the research team. Results shared will not include identifying details.

How will you know about the results of this research?

Participants in the study, should they require, will be made aware of the research results through a two-page communique using electronic mail. The electronic final version of the dissertation will also be made available if requested.

Will you be paid to participate in this study, and are there any costs for you?

Participation in this study will not yield your monetary value. You will only be charged for the time you spend participating. The researcher will fund this study.

Is there anything else that you should know or do?

You may contact the researcher, **Mohau Thamae,** at **082 571 6865** or the supervisor, **Dr. Christi Niesing** [Christi.Niesing@nwu.ac.za], with any questions or concerns about the study. For questions about your rights as a participant, contact the NWU Research Ethics Committee using the same Email. You will receive a copy of this information and consent form.

Consent: By signing below, you acknowledge:

- The study's purpose, procedures, risks, and benefits have been explained.
- You have had the opportunity to ask questions, and they were answered satisfactorily.
- You know participation is voluntary, and you may withdraw without penalty.

Participant's Signature_____ Date._____

Researcher's Signature _____ Date._____

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Appendix B: Declaration

Declaration by participant

By signing below, I _____agree to participate in the research study **"An Analysis of the Strategic Communication of EMS within the North West Province."**

I declare that:

I have read this material or had it taught to me in a language I am familiar with and proficient in by a reliable source. I received a thorough explanation of the study. The individual requesting my permission and the researcher have allowed me to raise questions, and everyone has been addressed. I know that participation in this research is entirely voluntary and that I have not been coerced. I am free to exit the research at any moment which will not harm my treatment. If the researcher determines that I should quit the study before it is complete or do not adhere to the study plan as agreed, I can be requested to do so.

Signed at: _____ On: _____

Signature of participant Signature of witness

_____ _____

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Declaration by researcher

I, Mohau Thamae, declare that:

- I explained the information in this document to (PARTICIPANT ID)
- I did/did not use an interpreter
- I encouraged them to ask questions and took adequate time to answer them, or I was available should they want to ask any further questions.
- I am satisfied that they adequately understand all aspects of the research, as described above.
- I am satisfied they had time to discuss it with others.

Signed at: _____ On: _____

Signature of researcher Signature of supervisor

_____ _____

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Appendix C: Interview Guide

Section A: Demographic Information

- What is your age?
- How long have you been in the industry?
- What is your highest educational qualification?

Section B: Questions for the EMS provider

Topic	Research Interview question	Responses
EMS provider	How long have you been part of the EMS in NWDoH?	
	What is your position within the organisation?	
	What is your qualification?	
	What do you understand about strategic communication within the EMS?	
	What are the challenges regarding strategic communication within the EMS?	
	How can these strategic communication challenges be addressed?	

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	Section C: Interview Questions for the Community Member	
Topic	Research Interview question	Responses
Interview questions for the community members served by the EMS	How do you experience the services rendered by EMS in your area?	

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Appendix D: Letter of Approval – DoH



Name of Researcher: Mr. Ma Thamae

North-West University

Physical Address: 9 N.P. Van Wyk Louw Street. Langenhoven Park. Bloemfontein

(Work/ Institution) North West Business School

Subject: Research Approval Letter An analysis of the strategic communication regarding Emergency Medical Services within the North West Province,

---

This letter informs the Researcher that the North West Department of Health has granted permission to undertake the study as mentioned above. The Researcher must arrange in advance a courtesy meeting with the District Chief Director and the Chairperson of the District Health Research Committee (DHRC) (as per their details below) to introduce their research team/members to the proposed research to be undertaken. The researcher can, after that, proceed to the identified institution/s and facility and produce this letter to the Management as proof that the NWD0H approved the research-

This letter of permission should be signed and a copy returned to the department. By signing, the Researcher agrees, binds him/herself and undertakes to furnish the Department with an electronic copy of the final research report. Alternatively, the Researcher can also provide the Department with an electronic summary highlighting recommendations that will assist the Department in its planning to improve some of its services where possible; through this, the Researcher will not only contribute to the

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academic body of knowledge but also contributes towards the bettering of health care services and thus the overall health of citizens in the North West Province.

Below are the contact details.



Office of the Chief Director:

Ms. Dineo Moromane

Chairperson of the DHRC

Dr. Kenneth Kaunda District

Dr. L. Mahole

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Contact person: Mr Calvin Mmisele

018 462 5744

CMmisele@nwpg.gov.za

Office of the Chief Director:

Ngaka Modiri Molema District

Ms. M- Mokhutswane-Kaudi

Contact person: Ms Boitumelo Sethaiso

018 384 0240

Kindest regards,

Dr. FRM Reichel Director:

:or: RM&E

14/2/2024 Date:

Contact person: Thenjiwe Seitiso

018 462 5744 Email: tseitiso@nwpg.gov.za

Chairperson of the DHRC

Dr M. Nong

Contact person: Ms Wame Makara

018 384 024

Researcher

Date: 2024/02/14

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Appendix E: Ethics Approval Letter Of Study

Private Bag X1290, Potchefstroom
South Africa 2520

Tel: 018 299-1111/2222
Fax: 018 299-4910
Web: http://www.nwu.ac.za

Senate Committee for Research Ethics
Tel: 018 299-484
Feziwe.Mseleni@nwu.ac.za

30 November 2023

ETHICS APPROVAL LETTER OF STUDY

Based on approval by the **Economic and Management Sciences Research Ethics Committee (EMS-REC)** on, 24/11/2023 the Economic and Management Sciences Research Ethics Committee hereby **approves** your study as indicated below. This implies that the North-West University Senate Committee for Research Ethics (NWU-REC) grants its permission that, provided the special conditions specified below are met and pending any other authorisation that may be necessary, the study may be initiated, using the ethics number below.

Study title: Analysis of the strategic communication of the Emergency Medical Services within the North West province

Study Leader/Supervisor (Principal Investigator)/Researcher): Dr C Niesing

Own Research (12681644)

N	W	U	-	0	1	9	7	2	-	2	3	-	A	4
Institution				Study Number						Year			Status	

Status: S = Submission; R = Re-Submission; P = Provisional Authorisation; A = Authorisation

Application Type:
Commencement date: 11/12/2023 **Risk:** **Minimal**
Expiry date: 11/12/2024
Approval of the study is initially provided for a year, after which continuation of the study is dependent on receipt and review of the annual (or as otherwise stipulated) monitoring report and the concomitant issuing of a letter of continuation.

Special in process conditions of the research for approval (if applicable):

-

General conditions:

While this ethics approval is subject to all declarations, undertakings and agreements incorporated and signed in the application form, the following general terms and conditions will apply:

- *The study leader/supervisor (principle investigator)/researcher must report in the prescribed format to the EMS-REC:*
  - *annually (or as otherwise requested) on the monitoring of the study, whereby a letter of continuation will be provided, and upon completion of the study; and*
  - *without any delay in case of any adverse event or incident (or any matter that interrupts sound ethical principles) during the course of the study.*
- *The approval applies strictly to the proposal as stipulated in the application form. Should any amendments to the proposal be deemed necessary during the course of the study, the study leader/researcher must apply for approval of these amendments at the EMS-REC, prior to implementation. Should there be any deviations from the study proposal without the necessary approval of such amendments, the ethics approval is immediately and automatically forfeited.*
- *Annually a number of studies may be randomly selected for an external audit.*
- *The date of approval indicates the first date that the study may be started.*

n the interest of ethical responsibility, the NWU-SCRE and EMS-REC reserves the right to:

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- *request access to any information or data at any time during the course or after completion of the study;*
- *to ask further questions, seek additional information, require further modification or monitor the conduct of your research or the informed consent process;*
- *withdraw or postpone approval if:*
  - *any unethical principles or practices of the study are revealed or suspected;*
  - *it becomes apparent that any relevant information was withheld from the EMS-REC or that information has been false or misrepresented;*
  - *submission of the annual (or otherwise stipulated) monitoring report, the required amendments, or reporting of adverse events or incidents was not done in a timely manner and accurately; and / or*
  - *new institutional rules, national legislation or international conventions deem it necessary.*

The EMS-REC would like to remain at your service as scientist and researcher, and wishes you well with your study. Please do not hesitate to contact the EMS-REC or the NWU-SCRE for any further enquiries or requests for assistance.

Yours sincerely,



Prof Diana Viljoen Bezuidenhout
Chairperson: NWU Economic and Management Sciences Research Ethics Committee

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Appendix F: Proposed Policy for Strategic Communications – EMS

Communication Policy for Emergency Medical Services in North West Province

1. Introduction

This policy aims to create a strong and dependable communication structure for Emergency Medical Services (EMS) in the North West Province of South Africa. It shall govern the use of communication tools and technology to guarantee efficient and effective communication during EMS operations, particularly in emergencies and in regions with restricted cell phone service.

2. Policy Objectives

- To provide continuous and dependable communication within EMS operations throughout the province.
- To reestablish two-way radios as a reliable auxiliary communication system.
- To augment the robustness of EMS communication systems by employing dual communication technologies.
- To enhance response times and coordination in emergencies via efficient communication.

3. Communication Tools

a) **Two-Way Radios -** All EMS vehicles and base stations will be outfitted with two-way radios to guarantee communication in regions with inadequate cellular reception.
b) **Cellular Phones -** Cell phones will be an auxiliary communication tool to enhance flexibility and extend coverage.

4. Implementation Strategies

a) **Equipment Distribution -** Distribute and install two-way radios in all EMS vehicles and EMS facilities across the North West Province.
b) **Training Programs -** Facilitate extensive training sessions for all EMS staff on proficiently using two-way radios and cell phones, emphasising technical operation, maintenance, and communication procedures.

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c) **4.3 Maintenance Schedule -** Implement a systematic maintenance regimen for all communication apparatus to guarantee operational efficacy and dependability. This encompasses regular inspections and prompt repair or replacement as required.

5. Communication Protocols

a) **Standard Operating Procedures (SOPs) -** Formulate and distribute Standard Operating Procedures (SOPs), delineating particular circumstances in which two-way radios should serve as the principal communication medium and when cellular phones should be used.
b) **Emergency Protocols -** Train people to use the dual communication system in crises, guaranteeing redundancy to avert communication failure.
c) **Security and Confidentiality -** Establish security protocols to protect critical information exchanged during EMS operations.

6. Monitoring and Evaluation

d) **Performance Monitoring -** Consistently assess and analyse the efficacy of communication systems using key performance indicators, including response times, system dependability, and personnel feedback.
e) **6.2 Continuous Improvement -** Implement a system for ongoing feedback and enhancement, facilitating the adjustment of communication tactics to address evolving requirements and technology progress.

7. Policy Review and Update

- This policy will undergo an annual review to accommodate technological advancements, operational requirements, and input from EMS professionals. Modifications will be implemented to enhance communication efficacy and responsiveness.

Through implementing this communication strategy, North West Province EMS seeks to equip all workers with the requisite skills and knowledge to sustain successful communication, particularly during critical situations and emergencies. This dual communication strategy, utilising two-way radios and cellular phones, will improve operational efficiency and the safety of EMS responders and their communities.

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Appendix G: Certificate of Language Editing

CM

Certificate of Editing

This serves to confirm that copy-editing and proofreading services were rendered to

Mohau M Thamae

for

An analysis of the strategic communication of emergency medical services within the North West Province

on

16 November 2024

I am a member of the **Professional Editors' Guild** (member number MYB001) and commit to the following codes of practice:

- I have completed the work independently and did not sub-contract it out
- I kept to the agreed deadlines and/or communicated changes within reasonable time frames
- I treated all work as confidential and maintained objectivity in editing
- I did not accept work that could be considered unlawful, dishonest or contrary to public interest

The author requested the following:

- proofreading for mechanical errors such as spelling, punctuation, grammar
- copy-editing that includes commenting on, but not correcting, structure, organisation and logical flow of content, basic formatting (headings, page numbers), eliminating unnecessary repetition
- checking citation style is correct, punctuating as needed and flagging missing or incorrect references
- returning the document with track changes for the author to accept/reject.

I confirm that I have edited and proofread this dissertation. As the language editor, I am not accountable for any changes made to this document by the author or any other party after my edit. The content of the work edited remains that of the author.

Charné Myburgh

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