Tailoring interventions to minimise the effect of traumatic situations on emergency medical service personnel in the United Arab Emirates: A qualitative study

A thesis submitted in the fulfilment of the requirement for the Degree of Doctor of Philosophy

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Abstract

Background: EMS personnel commonly experience traumatic events and associated poorer mental health. This thesis explores adapting post-traumatic stress (PTS) interventions among EMS personnel in the UAE.

Methods: The thesis comprises three interlinked studies:

- A narrative review of PTS prevalence among EMS personnel and the impact of exposure to critical incidents.
- A systematic review to evaluate effectiveness of interventions to mitigate PTS in EMS personnel.
- Semi-structured interviews with 20 EMS personnel, eight supervisors and two managers in two UAE EMS organisations to understand how to effectively implement PTS interventions in the UAE. Data were analysed through thematic analysis.

Results:

Study1: A narrative review (133 articles) of PTS risk factors in EMS workers following critical incidents revealed frequent exposure to PTS leads to a range of mental disorders.

Study2: Full-text assessment of 201 studies, selected from 1,143, identified 10 papers: four RCTs and six cross-sectional studies. Five interventions were evaluated: debriefing, cognitive behavioural therapy (CBT), eye movement desensitisation and reprocessing (EMDR), the SUPPORT-Coach App and downtime. Only CBT and EMDR were effective in reducing PTS.

Study3: EMS personnel interviews demonstrated a universal experience of PTS reactions after critical incidents. Irrespective of the magnitude of PTS, psychological support at work was an expectation. Critical incidents debriefings focused on the procedural aspects. Fear of misjudgement and stigma were barriers to seeking formal support. Suggested interventions included opportunities for timeouts, support from professional counsellors, self-help apps and creating a culture of recognition.

In contrast, manager and supervisor interviews revealed significant variations in perspectives on psychological needs of frontline EMS staff. Supervisors empathised, recognising debriefings as operational and suggested positive mental health terminology to reduce stigma, alongside collective organisational responsibility to implement a range of interventions.

Conclusions: The thesis demonstrates how tailored interventions could mitigate the effect of traumatic situations on EMS personnel working in the UAE.

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CHAPTER 1: INTRODUCTION AND BACKGROUND

1.1 What is the thesis about?

The purpose of this thesis is to identify the key principles that emergency medical service (EMS) organisations should consider when tailoring existing interventions for reducing or preventing post-traumatic stress to the context of emergency medical personnel working in the United Arab Emirates (UAE). Ideally, the identification of these principles will serve to make interventions more feasible, deliverable, and acceptable. Being a paramedic involves taking a series of risks as a result of dealing with critical incidents that may lead to the development of symptoms of post-traumatic stress, including post-traumatic stress disorder (PTSD). Although this issue is well known, it rate of incidence is underestimated (Rybojad *et al.*, 2016).

The present thesis includes secondary research in the form of narrative and systematic literature reviews as well as primary research using a qualitative approach. Because the main purpose of the thesis is to inform guidelines to facilitate the adaptation of existing interventions for EMS personnel to prevent or mitigate post-traumatic stress, a narrative literature review was conducted in order to understand the main concepts surrounding these phenomena, understand the interactions between the processes and outcomes associated with exposure to critical incidents among these individuals and finally present a theoretical model illustrating the relevant pathways. This model helped in understanding the aetiology of post-traumatic stress before proposing guidelines for tailoring effective interventions. Following this, a systematic literature review was carried out to evaluate the effectiveness of interventions to prevent or reduce post-traumatic stress in EMS organisations, irrespective of setting. The findings from the systematic literature review helped to reveal which interventions have proven to be effective in other settings, yielding an understanding of the factors that influence a positive outcome. Since the main purpose of this research is to tailor the best evidence about effective interventions to prevent or mitigate post-traumatic stress in EMS in the UAE, primary research using a qualitative approach was conducted to explore the sources of mental health support preferred by ambulance personnel in the UAE and to identify the barriers and facilitators to seeking professional support among this group. The study also explores the views of EMS personnel (also referred as frontline staff in this thesis), supervisors and managers in these organisations around available and recommended interventions that have been evidenced to be effective in other parts of the world. Based on the data collected in this research, a logic model was generated to identify factors that could contribute to the potential effectiveness of these interventions in the context of EMS organisations in the UAE

1.2 Thesis structure

This thesis comprises ten chapters.

Chapter 1 presents information related to the research background, aims, questions, and rationale of the study. In addition, this chapter provides a brief overview of the United Arab Emirates (UAE) and of emergency medical service (EMS) organisations within the UAE.

Chapter 2 then presents a narrative review (Study 1) of the literature on post-traumatic stress among EMS personnel and other first responders, and describes the prevalence of such stress among EMS personnel, its risk factors and consequences. It continues by proposing a model that illustrates the relevant pathways and interactions between the processes and outcomes associated with exposure to critical incidents.

Chapter 3 comprises a systematic review (Study 2) of the literature on worldwide interventions aimed at preventing or treating post-traumatic stress (ASD and PTSD) in EMS workers. The chapter investigates the various types of interventions and explores the effectiveness of these interventions in terms of reducing or preventing post-traumatic stress.

Chapter 4 discusses the general frameworks for developing complex interventions and tailoring interventions to new contexts. This chapter then outlines the rationale for choosing a modified approach of the Theory of Change (ToC) and details the various techniques involved in creating a ToC. It also provides a step-by-step process for the holistic, modified ToC framework adopted in the present study.

Chapter 5 provides a detailed overview of the research methodology used in the current study. The chapter discussed why the choice for qualitative research design was appropriate for the study's aims and objectives. Given that the main aim of the current study was to understand and explore participants' experiences and perspectives to formulate a practical tailored intervention for EMS workers in the UAE, a qualitative research design was most appropriate rather than quantitative or mixed-method designs. The chapter provides a detailed discussion of the research paradigm used for the current study while discussing alternative paradigms that were inappropriate for this study. The chapter further provided a detailed explanation of different types of qualitative methods. The chapter discusses the downsides of qualitative interviewing and how this may affect research findings.

Chapter 6 presents a description of the methods used for sampling, data collection, and analysis. It discusses the setting and selection of the study site, the choice and size of the sample, and recruiting and sampling procedures. In addition, the chapter discusses the choices of categories

for the population sample extraction, the criteria for the sample selection, justification of the final sample size, and the relevance of the choice. Detailed methods for the recruitment of frontline staff, supervisors, and managers, and the inclusion and exclusion criteria of the study are all discussed in this chapter. Furthermore, the interview procedure and aspects pertaining to data collection, materials, including the semi-structured interviews, and the guide used during the interview are explained. The chapter discusses my position as a researcher, the pilot study, the process of thematic analysis, the data coding, and ethical considerations. The significance of the chapter to the research question is explained as it describes procedures that contributed to achieving the main specific objectives of the research.

Chapter 7 presents the findings of the interviews conducted with 20 frontline staff. The findings are presented with thematic analysis. A discussion is provided regarding the findings, strengths, and limitations that are specific to the interviews conducted with the frontline staff.

Chapter 8 presents a thematic analysis of the findings from the qualitative interviews conducted with eight supervisors and two managers. These findings are discussed, and an assessment of the strengths and limitations of the research is included in addition to my personal reflection.

Chapter 9 draws a conclusion to the thesis by presenting a logic model that demonstrates the pathways that link findings from the systematic literature review with those from the qualitative interview. Furthermore, this chapter illustrates how these findings are combined to achieve the study's aim and objectives.

Chapter 10 is the final chapter; it begins with an overview of the study's strengths and limitations and ends with recommendations for future researchers and policy makers.

1.3 Research background

EMS workers often encounter distressing, traumatic events, also known as critical incidents (Mitchell, 1983), due to the nature of their work. This generally involves treating critically injured individuals, acting promptly in critical circumstances and attending cases where they witness threats to others (Regehr, *et al.,* 2003a, 2003b). In addition, EMS workers are frequently exposed to various occupational hazards that put them at the risk of harm, including violence (Regehr, Hill and Glancy, 2000) or cases that involve dealing with serious communicable diseases (James, 1988). An Australian-based study showed that approximately 88% of paramedics experienced work-related violence over their career (Boyle *et al*., 2007). Previous studies have indicated that the death of a patient is among the most distressing events experienced by EMS personnel (Clohessy and Ehlers, 1999; Alexander and Klein, 2001; Van der Ploeg and Kleber, 2003), and

caring for burned or severely injured patients was also deemed to be a profoundly stressful event. Other studies have indicated that dealing with dead bodies and human body parts are among the most distressing incidents identified by emergency responders (Ursano *et al.,* 1995; Regambal *et al.*, 2015).

The mental distress experienced by EMS workers could manifest as symptoms of anxiety, depression and PTSD, which can all contribute to having suicidal thoughts and attempting suicide (Nakao, Yamanaka and Kuboki, 2002; Thoresen and Mehlum, 2006). Moreover, a study of EMS staff in Norway found that having serious suicidal thoughts correlated with emotional exhaustion and depression (Sterud *et al*., 2008b). Ravenscroft (1994) and Rodgers (1998) found that the prevalence of PTSD among healthcare providers could be linked with sick leave, early retirement and burnout cases. Furthermore, exposure to traumatic events has been strongly associated with poorer mental health consequences and reduced quality of life (McFarlane, 2010). According to Donnelly (2012), exposure to critical incidents along with daily operational demands (chronic stress) increases the risk of developing post-traumatic stress symptoms among EMS workers. Another study has shown that all EMS personnel are exposed to traumatic incidents (Regehr, Goldberg and Hughes, 2002). Other studies have also observed the common psychological consequences associated with exposure to traumatic events (Clohessy and Ehlers, 1999; Alexander and Klein, 2001; Regehr, Goldberg and Hughes, 2002).

Furthermore, few studies have focused on the needs of these professionals (Eriksson, Foy and Larson, 2004). Most of the intervention studies proposed critical incident stress debriefing (CISD) (Mitchell, 1983) as an intervention for reducing stress after critical incidents (Everly and Mitchell, 1999; Smith and Roberts, 2003). However, there is a debate about the effectiveness of this intervention (Van Emmerik *et al*., 2002; Rose, Bisson and Wessely, 2003). The argument about the implementation and effectiveness of CISD leaves EMS organisations with little guidance when it comes to mitigating and preventing critical incident stress in their employees. Developing acceptable interventions that consider the needs of EMS personnel in an emergency setting remains a significant matter (Halpern *et al*., 2009a), especially in the non-western world.

The establishment of prehospital and emergency medicine care is considered a relatively new notion in the UAE; therefore, there is a lack of empirical research in this area (Fares *et al*., 2014). Past research in the country mainly focused on university students' experiences and views regarding mental health services (Al-Darmaki, 2003, 2011; Heath, Vogel and Al-Darmaki, 2016). Furthermore, to my knowledge, there is no research examining the factors that could potentially lead to effective interventions for post-traumatic stress in the EMS organisations in the UAE. In

this respect, it is important to take into account the different aspects within the setting where an intervention will be implemented, as what might work elsewhere may not work, for example, in the UAE. Viswanath and Chaturvedi (2012) noted this and emphasised that it is important to take into account the interaction between the biological, social and cultural aspects of the management of psychological diseases.

1.4 The UAE brief overview

The UAE is a country situated in the south-eastern of the Arabian Peninsula. The state emerged in December 1971 as the federation of the six emirates: Abu Dhabi, Dubai, Sharjah, Ajman, Umm Al-Quwain, and Fujairah (UAE Government Portal, 2022). In 1972 the seventh emirate, Ras AL Khaimah, joined the union, and the UAE became the federation of the seven emirates (UAE Government Portal, 2022). Today, it is one of the most potent nations of the Gulf region, influencing its development, policy, and economy. The UAE has the second-largest economy in the Middle East, with a GDP of around $427.9 billion (UAE Government Portal, 2022). It means the state can invest in new projects and support their development.

The healthcare industry in the country is given much attention, but emergency medicine and prehospital care is nowadays in the developing phase. Nowadays, the UAE's healthcare sector faces various challenges, such as dealing with different medical protocols, navigating a variety of training and education guidelines, and keeping track of diverse treatment policies among the various entities within the country (Sasser, Gibbs and Blackwell, 2009). It means that care providers might be limited in their attempts to assist patients. The UAE Ministry of Health (MOH) focuses on improving the infrastructure and the overall health delivery system to meet growing population needs (Sasser, Gibbs and Blackwell, 2009). Moreover, medical education is also supported as the country has only three medical schools preparing demanded specialists (Fares *et al.*, 2014). In such a way, prehospital emergency care is still developing under the influence of the government's efforts to improve the nation's health.

1.5 The context of EMS in the UAE

Compared to global standards, paramedical services in the UAE are relatively new. Emergency ambulance services in the UAE are provided by two public organisations: National Ambulance (NA) and the Dubai Corporation for Ambulance Services (DCAS). In 2012, a group of emergency physicians created the Emirates Society of Emergency Medicine (ESEM), focusing on developing high standards of practice and connecting all emergency medicine providers along with EMS professionals across the UAE (Fares *et al.*, 2014). It promoted the standardisation of approaches

and an increased focus on paramedic training as part of the new environment. Thus, the NA and DCAS operate within this network and play a critical role in delivering prehospital care to and meeting the needs of all patients within the UAE.

EMS was first introduced in Dubai in 1977, operated by the Dubai Police with the coordination of the Department of Health and Medical Services. The evolution of the state, its fundamental institutions and the healthcare sector highlighted the need to create an independent agency with an expanded scope (Dubai Corporation for Ambulance Services, 2023a). Therefore, in 2010, the Ruler of Dubai, His Highness Sheikh Mohammed Bin Rashid Al Maktoum, issued the Local Act, which integrated all prehospital care services in Dubai within one official government entity known as the Ambulance Service Centre, later renamed the Dubai Corporation for Ambulance Services (DCAS). The organisation is focused on providing a range of ambulance and emergency services to all representatives of the Dubai community (Dubai Corporation for Ambulance Services, 2023a). It performs a wide variety of functions, including the delivery of emergency and non-emergency ambulance services to citizens, private first-aid training and issuing professional licences. For this reason, DCAS became an independent entity with the medical dispatch operated by the Dubai Police (call receivers are police officers who coordinate with the emergency medical dispatchers in the control room). Specialists include trained emergency medical technicians (EMTs), paramedics, advanced paramedics and emergency physicians. DCAS owns more than 99 ambulance units that cover both rural and urban areas of Dubai, also offering transport services for patients and operating facilities within and outside the Emirate (Dubai Corporation for Ambulance Services, 2023a). It is characterised by stable development and increased attention on preparing specialists and developing infrastructure, making it an important part of the UAE healthcare system. Until the end of 2020, DCAS employed 900 EMT, 80 paramedic and 15 advanced paramedics. Among these EMS professionals, Emirati is 16.35%, 23% female (Oafi *et al*., 2022). Since ancient times, DCAS has been based on foreign personnel, consisting of mainly foreign frontline workers. The organisation plans to increase the number and qualifications of their staff to meet the population's demand for world-class medical services (Oafi *et al*., 2022). According to Oafi *et al*., (2022), the advanced level of the medics will not only provide a higher level of patient care but will also provide more incentive to attract more Emiratis to the profession. In the UAE and elsewhere, medics are moving to a more professional status within the workforce.

The National Ambulance is a large EMS organisation responsible for providing emergency care in the capital (Abu Dhabi) and the Northern Emirates (Sharjah, Ajman, Umm Al-Quwain, Fujairah and Ras Al-Khaimah). It was established in 2010 to ensure that all citizens have access to high-

quality pre-hospital services and benefit from improved well-being (National Ambulance, 2022b). The National Ambulance has more than 110 ambulance stations and a wide variety of functions, including maintaining international standards, using innovative technology and implementing recent advances in evidence-based practice into its own practice (National Ambulance, 2022b). The agency is supported by an advanced fleet of vehicles which allows it to respond to all emergency calls and work in close coordination with other healthcare agencies. Aware of the importance of this organisation, the government devotes significant attention to financing and innovating this service to ensure its stable operation and growth.

Together, these organizations perform the important function of providing clients with pre-hospital emergency care and are available to all citizens of the UAE in need or experiencing severe health problems. DCAS and NA can be contacted by calling 999 or 998 in case of emergency (Oafi *et al*., 2022). Requests can also be made for hospital-to-hospital transfer, transfer to home, appointments, consultations or non-emergency help through a dedicated non-emergency contact line. The two establishments are evolving in the context of the network established by ESEM and the incentives for improving the healthcare sector and care delivery.

1.5.1 Training levels of EMS personnel

Emergency Medical Technician

Emergency Medical Technician's (EMT's) main task is to provide basic medical care and to transport patients to an appropriate emergency department. The technician has the essential knowledge and skills to care for and transport patients. EMTs work as part of a comprehensive prehospital emergency response and are usually supervised by senior paramedics. They perform interventions using necessary equipment commonly used in standard ambulances (Eaton, 2019). Requirements for this level include an academic diploma in EMS, a bachelor's degree in nursing, an EMT licence, a BLS (Basic Life Support) course, a valid UAE driver's licence, and an Emergency Vehicle Operator (EVO) course (National Ambulance, 2022a).

Paramedic

A paramedic is a healthcare professional whose primary function is to provide advanced medical care to patients in critical and emergency situations. This team of specialists has extensive experience in emergency patient care and transportation (Eaton, 2019). Paramedics perform interventions using basic and advanced equipment typically used in a mobile intensive care ambulance (MICA), including the administration of drugs through intravenous lines (Dubai Corporation for Ambulance Services, 2023b). Requirements include a bachelor's degree in EMS,

a paramedic licence, BLS and Advanced Life Support (ALS) courses, a valid UAE driver's licence, and an EVO licence (National Ambulance, 2022a).

Advanced Paramedic

These specialists have been trained, have additional skills, and carry additional medications to provide a higher quality of pre-hospital care to critically ill and injured patients (Eaton, 2019). They have experience treating the most severe and traumatised patients, including people with severe cardiac and serious traumatic injuries. In addition, they can perform extensive, advanced interventions, such as needle decompression and endotracheal intubation (Eaton, 2019). In some cases, they are connected with medical directors who can assist them in performing minor operations on scene. The advanced diagnostic devices used to intervene and manage patient care are typically found in an advanced response vehicle, such as MICA or neonatal intensive care ambulance (Dubai Corporation for Ambulance Services, 2023b). Requirements for this level include a bachelor's degree in EMS, an Advanced Paramedic licence, BLS and ALS courses, completion of a Preceptorship Program, and an Incident Management and Critical Care Paramedic course. In addition, a Disaster and Crisis Management course, Risk Management Course, a valid UAE Driver's licence, and an EVO licence are required (National Ambulance, 2022a).

1.5.2 Costs and Insurance

The UAE has a specific approach to insurance and treatment costs. According to the existing regulations, prehospital care is offered free of charge to all UAE nationals (Sasser, Gibbs and Blackwell, 2004). As a result, all public hospitals in the country treat all cases with no additional payment, except for some minor emergencies (Fares *et al*., 2014). Private hospitals, however, require advance payment to work with clients for some cases and expatriates are required to have standard medical insurance that covers medical emergencies, although the provision of care to stabilise any critical case is free of charge (Fares *et al.,* 2014). The mandatory insurance programme was implemented to guarantee that all citizens are able to access the emergency medical services they need.

1.5.3 Emiratisation

The UAE conducts an Emiratisation policy, focusing on increasing the role of nationals in various spheres. In terms of healthcare, the government encourages UAE citizens to work in this field and contribute to the sector's development. This is a long-standing priority and will guarantee a sufficient supply of Emirati healthcare specialists (Oafi *et al.,* 2022). The major barriers include

the nature of work after graduation and the high level of responsibility (Fares *et al*., 2014). However, as part of the Emiratisation policy, the government has created new infrastructure and learning facilities and is focused on making health-worker positions more attractive (Oafi *et al*., 2022), resulting in a steady growth in the number of UAE nationals working in this sector (Fares *et al.,* 2014).

Emiratis represent only a small percentage of frontline EMS personnel in the UAE. The majority of frontline workers are from the Philippines, India and Jordan, and have graduated with either a nursing or an emergency medical technician (EMT) degree from their home country. Recently, staff have joined the service from South Africa and Egypt. The Emiratis tend to work at the paramedic or advanced paramedic level, as a result of government policy aimed at preparing UAE nationals to hold more senior roles in emergency care and contribute to the development of the sector (Fares *et al.,* 2014). Most of the managerial positions within the two organisations are held by Emiratis. Whereas a clinical supervisor position (also known as shift in-charge) is either held by Emiratis paramedics or senior Jordanian EMTs. Additionally, Emiratis are motivated to take part in training programmes focused on improving skills and levels of preparation among staff (Oafi *et al*., 2022).

1.5.4 Resources

Finally, the emergency service has a sufficient supply of vehicles to perform its core functions. The majority of ambulances are fully equipped and characterised as ALS/Type 3 vehicles (Fares *et al*., 2014). The agencies also use fast responder units, motorcycles, neonatal and maternity care units, mobile intensive care ambulances (MICA), helicopters (air ambulance) and bus-based mobile hospitals for serious accidents involving numerous victims (Dubai Corporation for Ambulance Services, 2023b). Ambulance vehicles are either driven by paramedics or specially trained ambulance drivers who are trained in basic life support and first aid.

Overall, the emergency service in the UAE is in the development stage, benefiting from government attempts to create a potent healthcare sector and improve the nation's health. For this reason, numerous attempts have been made to involve more nationals in the work of the emergency teams. The establishment of new standards of practice and new methods and procedures create the basis for future improvement (Fares *et al*., 2014; Oafi *et al*., 2022).

1.6 Rationale of the research

As mentioned previously, EMS personnel are exposed to traumatic events due to the nature of their work. The frequent development of post-traumatic stress in EMS workers and the

persistence of these symptoms could lead to a range of mental disorders, in particular, post-traumatic stress disorder (PTSD) (Sterud, Ekeberg and Hem, 2006; Naumann *et al*., 2017; Davis *et al.*, 2019). Their frequent exposure to traumatic events increases their risk of developing post-traumatic stress reactions (De Boer *et al.*, 2011). PTSD could have a significant negative consequence for the public, the country's economic state, and the healthcare system collectively (Buljan, 2015). Moreover, a study by Gallagher and McGilloway (2008) demonstrated the effect of post-traumatic stress on the emotional well-being of ambulance workers, with consequential effects on their overall well-being. There is also evidence showing the impact of PTSD on the performance of healthcare professionals and thus the quality of care provided to patients (de Gucht and Maes, 2012). In addition, there are currently no studies in the UAE that explore the EMS workers' experiences and views regarding potential effective interventions for mitigating common post-traumatic stress reactions.

The motivation to undertake this study comes from my personal interest and experience as an advanced paramedic working in Dubai for almost ten years. Although there is development in the mental health field in the UAE, it is still considered to be in its initial stages (Sayed, 2015). The psychological health of these individuals working in high-risk occupations is a considerably neglected area of research in the UAE. My background helped me to understand many of the challenges and experiences encountered by this group of people, and it also aided my understanding of their perspectives and the context of EMS organisations in general. Through this research, I aim to contribute to EMS research by exploring the key principles that should be taken into account when tailoring interventions for reducing or preventing post-traumatic stress, in particular in non-western communities. However, it was crucial that I remained mindful of avoiding the risk of bias when collecting data for my primary research, as such bias could unintentionally be generated from my background and personal experience in the field of EMS.

1.7 Aim, objectives and research questions

1.7.1 Aim

To identify potential ways to tailor and adapt existing interventions aimed at mitigating or managing the effects of post-traumatic stress on EMS personnel to fit the local context of the UAE.

1.7.2 Objectives

1. To identify the relevant pathways and interactions between the processes and outcomes associated with exposure to critical incidents (Study 1, narrative literature review).

2. To review available evidence on what types of interventions work in different settings (Study 2, systematic literature review).
3. To explore the perspectives and experiences of EMS personnel and the views of supervisors and managers regarding current interventions (primary research).
4. To explore staff (EMS personnel, supervisors and managers) perspectives on organisational barriers to and facilitators of the implementation and effectiveness of existing interventions (Study 3, primary research).
5. To identify principles to consider when tailoring existing interventions (Study 3, primary research).
6. To present a theoretically driven logic model that serves as a basis for future interventions designed to prevent or reduce post-traumatic stress among EMS personnel in the UAE.

According to the literature gap, the following research questions have been formulated to address this issue:

1.7.3 Research question

Which factors need to be considered when tailoring and delivering post-traumatic stress interventions to make implementing them feasible and acceptable in the UAE?

Sub-questions:

- What are the perspectives and experiences of EMS personnel regarding current workplace interventions?
- What are the personal beliefs of EMS personnel regarding their reactions following encountering a critical incident and what are their preferred sources of support?
- What are the views of EMS managers and supervisors regarding existing interventions in other settings?
- Which specific elements of these interventions need to be modified to make their implementation acceptable within the cultural context of EMS organisations in the UAE?

1.8 Contribution to existing knowledge

Prior studies have mainly focused on western cultures. Additional perspectives are needed from other cultures, such as Arabic and Asian, which dominate the UAE context. This research also contributes to an improvement of the understanding of the relevant pathways which shape

effective interventions for reducing post-traumatic stress among this group of professionals. In terms of practice, the findings of the study can be used to develop targeted interventions among emergency medical professionals from a cultural and occupational perspective by exploring their beliefs and cultural systems. This will clarify the main elements that should be addressed when creating or adapting these interventions. This will, in turn, help to mitigate the risk of staff members developing adverse mental health conditions and support them in remaining in their job.

CHAPTER 2: A NARRATIVE LITERATURE REVIEW OF POST-TRAUMATIC STRESS AMONG EMS PERSONNEL

2.1 Introduction

This chapter presents a review of literature concerning post-traumatic stress in EMS with an aim of understanding the determinants of this phenomena and to identify the relevant pathways and interactions between the processes and outcomes associated with exposure to critical incidents. Themes were identified by reviewing the literature via a systematic search strategy. The chapter starts with providing information about the prevalence of post-traumatic stress in EMS and the characteristics of the critical incidents experienced by EMS workers, followed by an overview of the common mental conditions that result from exposure to critical incidents and the key predictors of post-traumatic stress in EMS workers. The chapter then looks at the effect of post-traumatic stress on service delivery, in particular quality of care and finally the concept of post-traumatic growth is considered. Based on the literature, a theoretical model is presented at the end of the chapter that illustrates the pathways and interactions between the different elements associated with post-traumatic stress following critical incidents.

Studies related to other healthcare occupations, such as emergency department physicians and nurses have also been included, due to the similarity of their job characteristics that involve treating traumatised patients and for the purpose of examining the effect of post-traumatic stress on the quality of care along with studies involving first responders in general (that included paramedics in their population). However, studies focused on other emergency responders such police officers and firefighters (unless firefighter paramedics) have been excluded from this review. This because the focus is on who are specialised in providing medical care to injured people. Studies found in articles' reference lists were also considered for the potential data collection on the basis of their titles. Moreover, studies focusing on other psychological consequences of exposure to critical incidents such as burnout and secondary traumatic stress (STS) have been included in this review.

Both peer reviewed and grey literature was included in the initial search strategy for relevant literature on the topic of post-traumatic stress occurrence among EMS personnel. Research studying human subjects and published in English as well as not limited to a particular geographical location was searched in the following databases: PsycINFO (via Ovid), MEDLINE (via Ovid), CINAHL (via EBSCOhost) and Google Scholar. Publication years of the articles did not represent a limitation for the search. Keywords used for selecting articles included:

‘emergency medical technician’, ‘EMT’, ‘ambulance’, ‘EMS’, ‘paramedic’, ‘emergency medical service’, ‘post-traumatic stress’, ‘post traumatic stress’, ‘posttraumatic stress’, ‘PTSS’, ‘PTSD’, ‘acute stress’, ‘critical incident stress’, ‘prehospital’ and ‘pre-hospital’. Boolean search terms were employed in the databases using the operator ‘AND’ to search for keywords relating to post-traumatic stress and emergency medical services. The operator ‘OR’ facilitated the inclusion of terms relevant to these two subjects. Moreover, truncation was applied to broaden the search. To facilitate the synthesis of data, full copies of the articles identified through this search were obtained. The articles were required to satisfy the predetermined inclusion criteria, which were based on their titles, abstracts and subject descriptors. The search was conducted from May to July 2019.

I independently extracted the necessary data for the current analysis before utilising Mendeley to generate results from the databases and identify any duplicate studies. I screened the titles and extracted abstracts from the selected databases based on the inclusion criteria. I subsequently performed a detailed assessment of the full text of the selected articles. Those that failed to fulfil the inclusion criteria are reported in Figure 1 below, accompanied by the justifications for their exclusion. To gain a comprehensive understanding of the determinants surrounding this phenomenon and a solid overview of the main subjects related to post-traumatic stress, I made a concerted effort to broaden the search results. Therefore, I excluded terms specific to interventions from the search strategy to prevent limiting the results solely to post-traumatic stress interventions. Common subjects discussed in the literature were subsequently categorised into themes, which were later reviewed by both supervisors. Figure 1 illustrates the PRISMA flow diagram.

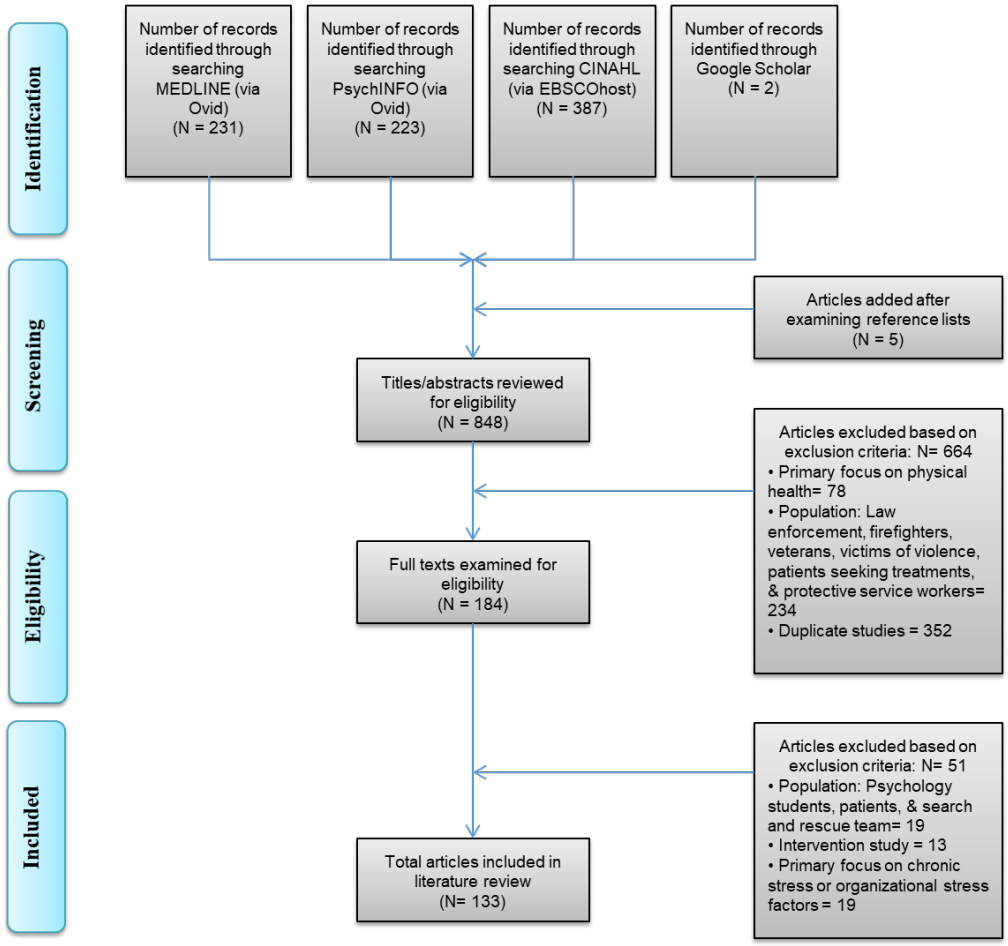


Figure 1: PRISMA flow chart for identification and screening of studies for narrative review.

2.2 Prevalence of post-traumatic stress in EMS workers

EMS workers are at risk of developing psychological distress due to the occupational demands they face daily (McFarlane and Bryant, 2007; Donnelly and Siebert, 2009; Mishra *et al.*, 2010). Donnelly (2010) emphasised that post-traumatic stress (also referred in this study as critical incident stress) is associated with the emotional sequelae resulted from experiencing traumatic events. The author also noted that critical incidents could be conceptualized as a single incident or the result of more than one traumatic incident (e.g. dealing with multiple death cases in a short period of time). Post-traumatic stress involves a variety of reactions, which generally include symptoms of re-experiencing the traumatic event, avoidance of whatever is related to the traumatic experience, emotional numbing, and hyperarousal (Jackson *et al.*, 2007; American Psychiatric Association, 2013). Consequently, exposure to multiple critical incidents (traumatic events) is associated with high level of post-traumatic stress, thus increasing the risk of

psychological disorders, in particular PTSD (Ward, Lombard and Gwebushe, 2006; Naumann *et al.*, 2017). PTSD has been notably documented in the literature and frequently associated with the high exposure of EMS workers to critical incidents (Sterud, Ekeberg and Hem, 2006; Donnelly and Siebert, 2009).

Prevalence rates of PTSD varied across the studies (ranging from 4-40%). A systematic review by Berger *et al*. (2012) provided an insight into the occurrence of PTSD among EMS workers worldwide, pointing to the differences in the disease's prevalence in different geographical locations. The global pooled occurrence of PTSD was 10%, with workers in Asia having a higher estimated prevalence of the disease compared to European emergency personnel. The estimates for North America were similar to those for Asia. The review demonstrated that ambulance personnel showed higher rates of PTSD than police officers and firefighters. This was also evidenced by a recent meta-analysis that evidenced the high prevalence of mental disorders among EMS personnel, including PTSD, anxiety and depression. Results demonstrated that the prevalence of PTSD among EMS workers is approximately 11% (Petrie *et al.*, 2018a). Another study conducted in the UK showed that newly employed paramedics exhibited significant symptoms of PTSD. Nearly 8% of the participants developed symptoms of post-traumatic stress and consequently higher levels of burnout during their 2 year-training phase, which affected their functioning (Wild *et al.*, 2016). The authors implied that despite nearly all of the participants encountering at least one traumatic event during their training period; most of them did not develop PTSD or depression.

Lubin *et al.* (2007) studied the occurrence of acute stress disorder (ASD) and PTSD among medical personnel (141 ambulance medics and 19 emergency doctors) who responded to 23 traumatic incidents in Israel. The findings were surprising as PTSD was found to be extremely rare in the studied population, occurring in only one medic. ASD, however, was found in one doctor and 12 medics. Therefore, the scholars concluded that the occurrence of PTSD in emergency healthcare personnel is inconsistent, and that it depends on the group of professionals that is being examined. While the general lifetime prevalence of PTSD is estimated at around 8%, the findings of the study involving emergency care workers are inconsistent (from 4 to 22%) (Sterud, Ekeberg and Hem, 2006; Misra *et al.*, 2009; Mishra *et al.*, 2010). Also, a review by Skogstad *et al.* (2013) suggested that those who work in high-risk occupations such as ambulance professionals, police officers, and firefighters have higher rates of developing of PTSD as a result of dealing with critical incidents.

Mishra *et al*.'s (2010) examined the prevalence rate of post-traumatic stress symptoms among

EMS staff working in Hawaii and found that 83% of them revealed having symptoms (but did not develop PTSD) and around 4% met the clinical criteria for PTSD diagnosis. The authors indicated that ambulance workers are at high risk of developing post-traumatic stress due to their work characteristics that involve dealing with stressful events such cases involving children or injury to a co-worker. Moreover, a pilot study conducted in Poland showed that the prevalence rate of PTSD among ambulance staff was 40% (Rybojad *et al.*, 2016).

Fjeldheim *et al.* (2014) explored the occurrence of PTSD among paramedic trainees. Although 94% of those trainees had experienced traumatic events, only 16% exhibited symptoms of PTSD. Moreover, a review by McFarlane, Williamson and Barton (2009) found that the prevalence of PTSD among first responders (EMS personnel, police officers, and firefighters) was between 6% and 32% and that paramedics showed more symptoms of PTSD than police officers and firefighters. The authors indicated that PTSD symptoms were associated with greater exposure to critical incidents and emotional distress.

A study by Luftman *et al.* (2017) indicated that EMS personnel were more likely to show symptoms of PTSD (not completely met PTSD criteria) than hospital-based healthcare professionals, 42% as compared to 21%. Notable findings include the fact that only 55% of those healthcare providers (prehospital and hospital-based staff) received education on PTSD, and only 13% ever sought mental help treatment. These results point to the need to increase the awareness of PTSD among healthcare personnel (Luftman *et al.*, 2017). The exposure of ambulance personnel to critical incidents contributed to their likelihood of developing mental health conditions. These findings were supported by Jones *et al.* (2018), who implemented a survey for measuring the occurrence of psychiatric symptoms among paramedics and firefighters in the US. 26% of participants reported significant level of PTSD symptoms, 31% showed harmful behaviours associated with excessive alcohol use, 93% reported sleep problems, and 34% showed an increased risk of suicide.

In addition, Gómez-Gutiérrez *et al.* (2016) found that symptoms of PTSD were increasingly high among prehospital emergency professionals (EMS personnel, emergency doctors and emergency nurses) who were assaulted by patients and/or their relatives. Findings revealed that over a third (34.5%) of surveyed participants had been physically attacked during their work. It is also important to mention that 15.2% of respondents were witnesses of physical violence against their partners, and only 18.1% of those responders did not experience any level of aggression (neither physical nor emotional) when doing their work. The study revealed that the occurrence of violence against emergency health personnel inevitably increased their likelihood of developing

PTSD symptoms, which points to the need to explore this issue in greater detail in the future (Gómez-Gutiérrez *et al.*, 2016). In the Swedish context, Jonsson, Segesten and Mattsson (2003) studied the occurrence of PTSD among ambulance personnel by surveying 362 professionals. Of those individuals who encountered traumatic events, 15.2% scored 31 and higher on the IES-15 subscale, implying a stressful reaction with a higher possibility of developing PTSD. On the PTSS-10 scale, 12.1% of respondents scored five and higher, which is an indicator of relatively high stress reactions.

A systematic review conducted by Sterud, Ekeberg and Hem (2006) explored the health status of EMS professionals showed that individuals working in EMS have a higher risk of mortality rates and psychological problems (such as PTSD symptoms and anxiety), as well as a higher rate of early retirement than other healthcare professionals. While the study did not find any evidence for ambulance workers suffering from a higher prevalence of psychological disorders compared to the general working population, it demonstrated the high prevalence of post-traumatic stress among ambulance staff (as symptoms rate exceeded 20% in five of the seven studies that examined the level of post-traumatic stress symptoms).

Following up on the various studies on post-traumatic stress among EMS personnel in different geographical contexts, it is essential to mention the article by Berger *et al.* (2007). The researchers conducted a cross-sectional survey to examine the level of PTSD among a sample of Brazilian paramedics. 5.6% of respondents exhibited signs of full PTSD, while 15% of participants reported partial PTSD (showing symptoms of PTSD but did not meet the full criteria of PTSD). The study demonstrated that those with PTSD had more emotional and physical problems than those who were not affected by PTSD.

In the Canadian context, Carleton *et al.* (2018) investigated the occurrence of psychological disorders among a group of public safety workers (paramedics, police officers, firefighters and dispatchers). 49.1 % of paramedics involved in the study showed positive results for mental disorders (PTSD, anxiety and depression). The study by Bennett *et al.* (2004) explored the levels of psychological health issues in the context of EMS personnel working in the UK. Among the participants of the study, the overall rate of PTSD was 22%, which is more than a fifth of EMS workers in the UK. Moreover, the level of anxiety and depression among the participants were 22% and 10% respectively. Furthermore, a study conducted in Pakistan by Kerai *et al.* (2017) revealed that more than half of the ambulance professionals had experienced a critical incident at work (approximately 53%) and that the prevalence of PTSD among Pakistani EMS personnel was 23.9%.

It is also important to note that while the data collected in most of these studies was self-reported and thus had a certain degree of bias, the findings are important for suggesting that ambulance staff are highly likely to experience symptoms of post-traumatic stress, in particular PTSD that has potentially adverse mental and physical health implications. Furthermore, the use of different instruments in the measurement of PTSD symptoms makes it challenging to compare the prevalence of post-traumatic stress among different parts of the world.

2.3 Post-traumatic stress and characteristics of critical incidents identified by EMS personnel

Employees in high-risk occupations such as paramedics, firefighters and other first responders are often exposed to stress caused by critical incidents (Van der Ploeg and Kleber, 2003). All paramedics were exposed to at least one critical incident over their career (Regehr *et al.*, 2002). According to Mitchell (1983), critical incidents are recognised as stressful occupational events that can induce acute stress and diminish the functioning of individuals in either the short or long term. This definition is supported by Halpern *et al*., (2009b), who identified critical incidents as cases causing uncommon, extremely overwhelming emotions, either because of the event itself, the worker's response to it, or any other job-related reason. Previous studies identified the types of critical incidents based on the features of the event, including patient characteristics (e.g. a severely injured child), situational characteristics (e.g. on-scene threats or hazards), or personal characteristics (e.g. lack of control or feeling helpless) (Clohessy and Ehlers, 1999; Alexander and Klein, 2001; Regehr, Goldberg and Hughes, 2002; Halpern *et al.*, 2009b).

Alexander and Klein (2001) identified critical incidents as events that are exceptionally disturbing, thus affecting the individual's normal coping strategy. Caine and Ter-Bagdasarian (2003) defined critical incidents as overwhelming events that have an emotional influence sufficient to affect the worker's effective coping strategy, leading to psychological distress. Some may exhibit a prolonged or strong response to a critical incident that puts them at risk of developing health disorders (Selye, 1950). According to Halpern *et al*. (2009b), incidents that were categorised as critical among EMS personnel were those that involved death in combination with a tragedy. These events may cause vulnerable feelings of helplessness and extreme compassion, which can then lead to further emotional, cognitive and behavioural reactions (Halpern *et al*., 2009b). Notably, a critical incident is not necessarily a significant or major event; it can be identifying with a dying patient or accidentally harming a patient (Boland *et al.*, 2018).

The study by Marmar *et al.* (1996) is important to consider when exploring PTSD occurrence as related to exposure to critical incidents. The scholars studied the experiences of first responders

(including police officers, firefighters and paramedics) responding to an earthquake in San Francisco. Findings revealed that the development of PTSD among this population was associated with the experiences of the perceived threat and lower scores of coping with post-traumatic stress.

Boland *et al.* (2018) found that the most stressful events identified by EMS workers involved cases with children, patients known to the workers, or a medical error that led to deterioration in the patient's condition. Most studies indicated that cases involving severely injured children were among the most distressing (Clohessy and Ehlers, 1999; Alexander and Klein, 2001; Regehr *et al.*, 2002; Van der Ploeg and Kleber, 2003; Minnie, Goodman and Wallis, 2015; Boland *et al.*, 2018). Other stressful incidents described in these studies included treating burned or severely injured patients, mass causality incidents, road traffic accidents, murder cases and other dead patients, and handling the body parts of a dead patient. Evidence showed that elements operating during or after the critical incident (e.g. social support and severity of the experienced incident) are more significant in terms of their influence on the traumatic reaction than pre-trauma (pre-critical incident) elements (e.g. previous childhood trauma) (Brewin, Andrews and Valentine, 2000). In this study, the term "critical incident" is used interchangeably with "traumatic event".

2.4 Post-traumatic stress symptoms following critical incidents

The traumatic events experienced by emergency responders can have an adverse psychological effect, putting them at risk of developing post-traumatic stress reactions (Fullerton, Ursano and Wang, 2004; Donnelly, 2012). The usual response to traumatic incidents involves a variety of potential post-traumatic stress reactions, which generally include symptoms of re-experiencing the traumatic event (e.g. intrusion, recurrent nightmares and flashbacks), avoidance of whatever is related to the traumatic experience, emotional numbing (e.g. avoiding people, places and thoughts related to the incident), and hyperarousal (e.g. lack of concentration and increased irritability) (Jackson *et al.*, 2007; American Psychiatric Association, 2013). These symptoms improve over time in most individuals (Rothbaum and Davis, 2003). However, if these symptoms last for a month, then they meet the diagnosis for PTSD (American Psychiatric Association, 2013). PTSD has been well acknowledged in EMS literature more than other mental disorders. PTSD which has been classified as trauma and stressor-related disorders in the DSM-5, is a psychiatric condition that results from exposure to a distressing event (trauma) either by experiencing the trauma itself (direct exposure), witnessing it (in person), knowing that someone close was exposed to trauma (indirect exposure), or frequent or extreme exposure to the distressing details of that traumatic event (indirect exposure). The diagnostic criteria for PTSD requires:

- The existence a stressor (criterion A)
- Symptoms of intrusion (criterion B)
- Avoidance (criterion C)
- Negative mood and cognitive changes (criterion D)
- Increased arousal (criterion E)
- Duration of these symptoms for at least a month (criterion F)
- Notable functional impairment caused by the induced distress (criterion G)
- These symptoms are not related to substance abuse, medications or other conditions (criterion H)

These symptoms shall begin or worsened following exposure to a traumatic event. Moreover, new subtype for PTSD was added in the 5th version of the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM-5)* that include symptoms of dissociative (American Psychiatric Association, 2013). In the first month following a critical incident, an individual may experience symptoms of post-traumatic stress without meeting a diagnosis of PTSD. Severe symptoms that appear within two days to four weeks following a critical incident is recognised as acute stress disorder (ASD), that is also classified as a trauma and stressor-related disorders in the DSM-5 (American Psychiatric Association, 2013; Bryant, 2017). The symptoms of ASD overlap with the symptoms of PTSD. ASD requires at least three dissociative symptoms, along with symptoms of avoidance, intrusion and arousal, whereas PTSD does not require dissociative symptoms (American Psychiatric Association, 2013). Dissociative symptoms include detachment or numbness, lack of awareness, disconnection from reality and forgetting details about the distressing incident (American Psychiatric Association, 2013). Exposure to traumatic events increases the risk of ASD among EMS workers, which is a risk factor for the development of PTSD (Smith and Roberts, 2003).

A study of Scottish EMS workers found that approximately half had high levels of post-traumatic stress symptoms, and that these symptoms were directly linked to ‘psychological inflexibility’ (Davis, 2017, p. 43). In this context, psychological flexibility involves a number of characteristics, including the capability to recognise and adjust to various situational demands, obtaining a balanced life and shifting mindsets when needed (Davis, 2017). The absence of these characteristics could lead to the development of mental health problems (Kashdan and Rottenberg, 2010; Davis, 2017). Therefore, psychological inflexibility is arguably associated with

increased levels of mental health problems and higher levels of post-traumatic stress. In this context, Davis (2017) suggested the need for further evaluation of the relationship between psychological flexibility and post-traumatic stress.

While noting the causality and impacts of post-traumatic stress, Regambal *et al.* (2015) stated that though first responders routinely experience traumatic events, their PTSD symptoms are considered relatively low. The authors found that both uncontrollability and limited resources were linked to dissociative experiences during a traumatic event resulting in PTSD symptoms. The authors argued that dissociation could be a coping strategy used by these individuals to minimise the effect of stressful incidents on their emotions and wellbeing, particularly when dealing with traumatising events. This was also affirmed by Foa, Zinbarg and Rothbaum (1992), who observed that uncontrollable events are more likely to cause symptoms of PTSD. Despite the difference between post-traumatic stress symptoms and PTSD, the terms have been used interchangeably in the literature.

2.5 Other psychological consequences of exposure to critical incidents

Regehr, Goldberg and Hughes (2002) reported that elevated distress level among EMS workers was associated with the development of secondary traumatic stress (STS) as a result of dealing with traumatised patients. According to Cieslak *et al.*, (2013), STS is a PTSD-like reaction that results from indirect exposure to trauma, such as dealing with traumatised individuals. EMS workers are at higher risk of experiencing symptoms of STS when they develop an empathetic relationship with traumatised individuals (Regehr, Goldberg and Hughes, 2002). STS has been used interchangeably with ‘compassion fatigue’ and ‘vicarious trauma’ in the literature, and has been mostly examined in mental healthcare providers (Cieslak *et al*., 2013).

Although exposure to critical incidents had not been associated with burnout among EMS personnel (Boland *et al*., 2018), a systematic review showed a strong relationship between burnout and STS in personnel dealing with indirect trauma (Cieslak *et al.*, 2014). This was affirmed by a longitudinal study (Shoji *et al.*, 2015) that examined the link between STS and burnout in a group of healthcare specialists. The results of the study demonstrated that burnout is a risk factor for the development of STS. Research has shown an association between burnout and low quality of care in the healthcare setting (Leiter, Harvie and Frizzell, 1998).

Cieslak *et al*. (2014) defined occupational burnout as a mental health disorder common among individuals working in stressful professions. Similarly, Maslach and Jackson (1981) defined it as a condition in which a person experiences emotional exhaustion, depersonalisation and reduced

personal accomplishment. Burnout is common among individuals who their job entails helping and rescuing others (Maslach and Jackson, 1981).

Furthermore, research has indicated that burnout is positively linked to the issues of turnover and absenteeism among paramedics in the US (Fragoso *et al.*, 2016; Crowe *et al.*, 2018). Another study reported that the prevalence of burnout cases among emergency healthcare workers was significantly high and associated with intent to leave the profession (Hamdan and Hamra, 2017). High turnover rates could result in the loss of highly productive healthcare staff, thereby affecting the service quality. Hamdan and Hamra (2017) indicated that high burnout level was a result of having to deal with life-threatening cases and severely traumatised individuals in Palestinian emergency departments, and these events also contributed to the high levels of emotional exhaustion experienced among emergency healthcare staff.

Burnout has also been correlated with detrimental mental health outcomes among healthcare providers, which could negatively impact service quality (Hamdan and Hamra, 2017). This is also evident from the review by Williams *et al.* (2017), which noted a relationship between empathy and burnout. High burnout levels could result in low empathy among workers (Williams *et al.*, 2017), and could lead to negative attitudes towards patients, affecting the quality of care. Moreover, Crowe *et al*. (2018) demonstrated a correlation between high burnout and stressors in the EMS setting, finding that stressors exposed workers to a high risk of burnout, that resulted in significant workforce loss. The study confirmed a link between work-related burnout and turnover intentions. Previous studies also reported that doctors and nurses with high burnout levels had greater intentions to leave their occupation (Maslach, Schaufeli and Leiter, 2001; Aiken *et al.*, 2002; Poghosyan *et al.*, 2010).

Hamdan and Hamra (2017) found that emergency care providers who were exposed to violence at work reported higher levels of depersonalisation and anxiety. Maslach, Schaufeli and Leiter (2001) defined depersonalisation as a cynical feeling that one holds against their workplace, which is reflected in lack of concern and compassion for others, leading to direct implications for service quality levels (Alexander and Klein, 2001; Leiter and Maslach, 2009; Williams *et al*., 2010, 2017). Hall *et al.* (2016) noted that elevated post-traumatic stress levels among healthcare staff also led to a reduced capability for and interest in providing the best quality of service to patients. This could also manifest in staff detaching from the stressful work environment, which may result in negative attitudes towards patients, representing lack of empathy and concern towards patient needs and feelings.

Empathy is an essential element in the provision of care. Empathy facilitates communication

between the healthcare provider and their patient, resulting in a positive relationship. This positive relationship could act as a protective factor for the healthcare provider against burnout (Hojat *et al.*, 2015; Thirioux, Birault and Jaafari, 2016). Empathy facilitates reduction of anxiety and distress, as evidenced by Williams *et al*. (2017).

2.6 Predictors of post-traumatic stress among EMS workers

A number of studies have identified the risk factors of post-traumatic stress in EMS workers. Some of the most predominant factors include the characteristic of the critical incident (*Marmar et al., 1999; Declercq et al.*, 2011; Regambal *et al.* 2015). For instance, incidents involve children (Declercq *et al.*, 2011) and events which are classified as chaotic and in which the paramedics have limited resources (Avraham, Goldblatt and Yafe, 2014) have been associated with higher rates of PTSD. In addition, if the individual has had a past trauma or they have a history of mental illness, they are more likely to develop PTSD (Wild *et al.*, 2016; Jones *et al.* 2018). Other factors that have been identified are the personality traits (Halpern *et al.* 2011; Wild *et al*., 2016), paramedics' preferred coping strategies (Avraham, Goldblatt and Yafe, 2014), and perceived social support (Ogińska-Bulik, 2015). More research is required to find the effects of age and gender on the post-traumatic stress as previous studies showed mixed findings. These predictors are discussed below.

2.6.1 Individual characteristics

History of mental disorder and past trauma

Wild *et al.* (2016) indicated that newly employed paramedics with a history of mental disorder were at higher risk of developing PTSD during their training period. The study revealed that rumination about stressful incidents, which occurred before the commencement of training was a predictor of PTSD. In addition, a study by Maunder *et al.* (2012) demonstrated that paramedics who had experienced childhood trauma, physical, emotional, or sexual abuse were especially predisposed to experiencing post-traumatic stress in response to critical incidents.

The study by Jones *et al.* (2018), pointed out that the history of psychiatric disorders among first responders plays a vital role in predicting the occurrence of PTSD in this target group. Important considerations are necessary to account for severe anxiety symptoms, alcohol dependence, high risk factors for suicidality, as well as other psychiatric disorders that make the occurrence of PTSD more likely. These findings were also supported by Kerai *et al.* (2017) who revealed an association between the level of depression and anxiety and PTSD among the studies population. Paramedics with increased levels of depression and anxiety were more likely to develop

symptoms of PTSD.

Personality traits

Paramedics with a personality trait of neuroticism (Wild *et al*., 2016) and who are more likely to exhibit dissociation responses (Skogstad, Fjetland and Ekeberg, 2015) were more susceptible to develop symptoms of PTSD. According to Sareen (2014), considering the personality traits of first responders is essential for predicting the occurrence of PTSD. The author also indicated that exposure to critical incidents is more likely to lead to adverse mental health consequences when an individual has a personality trait of neuroticism and tend to use avoidance coping strategies.

With regards to the personality traits, paramedics who display insecure attachment, more specifically fearful-avoidant were more likely to experience post-traumatic stress (Halpern *et al.*, 2011). Furthermore, the study also noted that insecure attachment was also linked to destructive coping strategies as well as low social support. It is worth noting that personality has been identified in the existing literature as a factor that may influence the ability of EMS workers to cope with work-related stress (Pajonk *et al.*, 2011). Adler's theory of individual psychology suggests that the unique manner in which individuals perceive and use their experiences and abilities determines how they handle situations (Adler, 1927). For example, an individual with a personality of inferiority is susceptible to easily becoming discouraged, and as a consequence likely to fail to develop emotions and behaviours that can help with managing challenges. Other studies have similarly found that personality characteristics have a significant influence on coping methods (Caruso and Spirrison, 1994). Several models can be used to classify different personality traits. One of the most comprehensive models for describing personality, the Five-Factor Model (FFM) classifies personalities under neuroticism/nervousness (N), openness to experience (O), extroversion (E), restraint/orientation towards control (C), and altruism (A) (McCrae and John, 1992). Another dimension of risk taking (R) has also been added (Vries, Vries and Feij, 2009).

In the case of EMS workers, certain personality traits have been associated with improved ability to cope with occupational stress (both chronic stress and post-traumatic stress). In a German-based study that focused on emergency physicians and paramedics, Pajonk *et al.* (2011) found that while 50%–70% of the emergency physicians and paramedics were resilient, a considerable proportion of 30%–40% were anxious and insecure. In the study, resiliency was characterised as flexibility in responding to a crisis. The authors argued that although personality traits play role in the disparity of individuals' behaviours, other elements (such as cultural and social factors) should be considered when examining the individuals' interactions between each other. Also, the authors indicated that personality characteristics such as extroversion and risks-taking were associated

with resiliency among EMS workers. In contrast, neuroticism and altruism were found to be less beneficial for these workers due to the higher risk of mental health problems triggered by feelings of insecurity and anxiety among these individuals. Froutan *et al.* (2018) made similar findings in a study on resilience and personality traits among EMS workers in Iran. In the study, the authors described resiliency as the ability to adjust to challenges at work. Specifically, workers who scored low on neuroticism, a trait associated with anxiety, fear and depressed mood, were found to cope better with work-related stress (Froutan *et al.,* 2018).

Coping strategies

The ability to control emotions has also been identified to be a significant factor in relation to post-traumatic stress reactions (Shepherd and Wild, 2014). Paramedics using avoidant coping styles were more at risk of developing PTSD (Wild *et al.,* 2016). In addition, a study by Halpern *et al*., (2011) has found that there is a correlation between destructive coping strategies (e.g. self-blame and denial) and level of post-traumatic stress. According to Shepherd and Wild (2013), ambulance professionals who coped well with the event, gave more positive appraisals and hence were less susceptible to post-traumatic stress. The authors claimed that positive appraisals could reduce negative emotions and increase objectivity levels, which lead to a better way of coping with the distressing event. The results also indicated that those paramedics who did not cope well provided negative appraisals and displayed a higher degree of post-traumatic stress reactions.

Kucmin *et al.* (2018) measured the role of different coping strategies and optimism in increasing the level of PTSD among paramedics following a critical incident. The results indicated that the coping strategy associated with focusing on emotions was a significant predictor of PTSD levels while on the other hand, dispositional optimism was a negative predictor of the same. As mentioned by Spyros, Emmanuel and Constantinos (2008), ambulance workers who tend to use problem-solving methods were less likely to develop symptoms of PTSD. On the other hand, emotional suppression was characterised as negative coping strategies due to their contribution to the appearance of dissociative responses as well as subsequent PTSD (Marmar *et al*., 1999).

The ability of EMS workers to continue functioning at an optimal level in their professional domain requires the development of effective coping mechanisms (Kucmin *et al.*, 2018). Coping in this context describes the need to constantly change one's thinking and behaviours to better manage specific difficulties or demands that exceed available personal resources (Lazarus and Folkman, 1984). This highlights that coping efforts need to be constantly changing, meaning an individual needs to learn different strategies that might be required in different situations. Several theories have accordingly been put forward to explain coping strategies.

General adaptation syndrome

Selye (1950) offered a useful approach to understanding coping mechanisms through the theory of general adaptation syndrome (GAS). Notably, Selye was interested in understanding the fight-or-flight response occurs in the body during distressing situations. The study, based on an experiment using rats, identified three stages of adaptation or coping. During the first stage, the individual tends to develop an alarm reaction in which systems are activated, and hence increased alert over an issue that poses a potential danger. Stage two entails resistance, in which the individual attempts to revert to a state of physiological calmness by resisting the alarm. Normal stressors are thus likely to alarm an individual, but then adaptation is attained. According to GAS theory, complete calmness may in some instances be elusive, leading to the third stage: exhaustion. In this stage, the individual can no longer meet the demands of the stressor, becoming dysfunctional. The theory thus emphasises the need for intervention techniques that can help control the stressor before it can move to the third stage. Specifically, symptoms need to be identified early enough and relevant support provided when the individual can no longer cope with the demands (Selye, 1950).

However, the GAS model has been criticised on the basis that it fails to consider that emotional responses to different stressors are not uniform. It also overlooks the nature of physiological changes that arise as a response to stressors (Porter, 2013). In light of these limitations, other complementary theories need to be considered.

Transactional model of coping and social support

Another theory is the transactional model of coping and social support (Lazarus and Folkman, 1984). This model considers the choice of coping response as an outcome of appraisal of the degree of threat posed by the stressor (primary appraisal), and the amount of resources available to cope with the situation (secondary appraisal). With regard to primary appraisal, two coping responses are identified: problem-focused and emotion-focused coping (Hood and Carruthers, 2002). Problem-focused coping involves identifying ways of modifying or solving a present problem. For instance, an individual may engage in basic problem solving or learn new skills required to handle a problem (Hood and Carruthers, 2002). The emphasis is therefore on resolving the problem.

Unlike problem-focused coping, which is action-oriented, emotional-focused coping is passive in nature (Lazarus and Folkman, 1984). Specifically, this approach to coping addresses the emotional aspect of a problem, mainly in situations where an individual perceives that little can

be done to change the situation.

For example, the individual may engage in avoidance, distraction or acceptance (Hood and Carruthers, 2002). Some of the emotion-focused strategies of coping, such as reframing the cause of stress in a positive light, acceptance, and use of social support, have been shown to yield positive results. However, other emotion-focused strategies, such as avoiding thinking about the stressor and disengaging from the situation, are considered to cause increased distress (Porter, 2013). This was affirmed by the aforementioned study that was conducted among Polish EMS workers which found that emotion-focused coping increased the risk of PTSD. A key finding from this study was that most EMS workers were less likely to take advantage of social support resources in coping with traumatic events. Failure to seek social support is common among EMS workers who prefer emotional coping strategies (Kucmin *et al*., 2018).

Furthermore, studies showed a negative association between social support and mental disorders (Ogińska-Bulik, 2015; Donnelly *et al.*, 2016; Boland *et al.*, 2019). For instance, Ogińska-Bulik (2015) found that social support at workplace, in particular from colleagues aided the paramedics' coping abilities and were instrumental in maintaining mental health stability through reducing the risk of developing PTSD. Although these studies demonstrate that social support could act as a protective factor against the development of post-traumatic stress reactions among EMS workers (Donnelly and Siebert, 2009), its effectiveness is highly dependent on a range of other variables including personality, safety and level of post-traumatic stress symptoms experienced (Regehr, Goldberg and Hughes, 2002; Porter, 2013).

Gender, age and years of service

Berger *et al.* (2012), Ward, Lombard and Gwebushe (2006) and Misra *et al.*, (2009) did not find a significant difference in the level of PTSD between men and women. Although women showed greater level of depression and anxiety than men in relation to critical incident exposure (Ward, Lombard and Gwebushe, 2006). In contrast, Bennett *et al*. (2004) found that men were more susceptible to develop PTSD in comparison to women, as the prevalence rate of PTSD among men in the study was 23% compared with 15% among women. This was also noted by Berger *et al.* (2007) who revealed that female Brazilian ambulance staff had lower prevalence of full PTSD than their male co-workers (1.9% compared to 6.7%). On the other hand, Rybojad *et al.* (2016) found that female paramedics had higher prevalence rates of PTSD compared to male paramedics (64% to 36%, respectively). However, due to the unequal distribution of males and females in the EMS organizations, the findings regarding the prevalence of mental health disorders among male and female EMS personnel should be used with caution (Bennett *et al*.,

2004).

With regards to age, it has been demonstrated that EMS personnel who were older and had more work experience were at greater risk of developing PTSD symptoms (Spyros, Emmanuel and Constantinos (2008); Carleton *et al.*, 2018). This is because those who had more work experience had greater exposure to critical incidents than younger or newly employed professionals (Carleton *et al.*, 2018). This was affirmed by Jonsson, Segesten and Mattsson (2003) who indicated that those who are in the EMS profession for longer times and do not have enough resources and support to recover following encountering critical incidents have greater susceptibility to the development of post-traumatic stress.

On the other hand, Kerai *et al.* (2017) found that younger EMS personnel showed more symptoms of PTSD. The authors argued that the younger the age of the EMS professional, the less likely he/she is capable to effectively manage stress. However, Misra *et al.* (2009) did not find any relationship between age and years of service with the level of PTSD and psychological distress among EMS personnel who responded to London bombings.

2.6.2 Organisational factors

Organisational factors can be categorized into acute stressors (exposure to critical incidents) and chronic stressors (general working conditions) (Van der Ploeg and Kleber, 2003). Donnelly (2012) indicated that EMS organisations should be concerned to the level of stress associated with both critical incident exposures as well as chronic stress experienced by staff on a daily basis, as exposure to both sources of stress increases the risk of developing symptoms of PTSD.

Acute work-related stressors

According to Wild *et al*. (2016), the total number of traumatic events experienced by paramedics during their training period was not correlated with the risk of PTSD. However, the authors pointed out that a person's response to the traumatic event predicted PTSD levels. For instance, Regambal *et al*. (2015) found that if paramedics perceive the critical incident as chaotic and felt helpless due to limited resources, they are ought to engage in a higher rate of dissociation during the event, leading to greater risk of PTSD. This was also evidenced by Declercq *et al*. (2011) who demonstrated that the subjective response (characterised by the feel of fear and helplessness) to traumatic events significantly contributed to symptoms of PTSD (in particular, hyperarousal and intrusion symptoms) in paramedics. Although the study did not find any association between the frequency of exposure to critical incidents and the intensity of symptoms.

Skogstad, Fjetland and Ekeberg (2015) indicated that feeling overwhelmed during the event as

well as lack of equipment and resources were predictors of PTSD among the Norwegian first responders. The researchers also noted that symptoms of dissociation were the strongest predictor of symptoms severity among the study's participants. Moreover, Alexander and Klein (2001) found that the effect of the incident itself on the ambulance workers was related to the recovery time between the incidents.

In addition, a study conducted in the UK that investigated the level of mental distress among EMS staff who responded to London bombings occurred in 2005 revealed that those who were directly involved in treating the injured patients at the scene exhibited higher risk of PTSD than those who were distant from the scene (6% compared with 1%,) (Misra *et al.*, 2009). However, there was no association between the severity of cases and the level of psychological distress in the study's sample. This was in line with the study by Halpern *et al.* (2009b) who found no association between the nature of incident and type of emotional sequelae (e.g. social withdrawal and irritability) experienced by ambulance staff.

Chronic work-related stressors

Mishra *et al.* (2010) found that general work circumstances affect the overall stress level experienced by EMS personnel. This included role conflict that led to an imbalance between work and home life as well as shift work. The authors suggested the need to establish a positive work environment for strengthening the psychological well-being of EMS professionals. Moreover, a longitudinal study carried out by Van der Ploeg and Kleber (2003) with a sample of 123 ambulance workers in the Netherlands found that while there was no correlation between acute stressors and long terms health effects, chronic stressors, (e.g. lack of social support) as well as poor communication in the workplace (e.g. not being acknowledged regarding vital decisions), strongly correlated with occupational stress and burnout.

In addition, Bennett *et al.* (2005) indicated that chronic stress caused by lack of support from the management increased the level of mental distress among the ambulance workers. The authors argued that an environment characterized by low social support, especially from managerial staff could make the frontline staff feel uncomfortable in expressing their emotions leading to anxiety and depression, thus increasing the risk of developing PTSD. Al Enazi and AlEnzie (2018) similarly explored the factors that contribute to stress and burnout among EMS workers in Saudi Arabia. The study revealed that the role, which involves dealing with unpredictable emergencies as well as demands such as night shifts and long hours, exposed them to the risk of mental health problems, which could negatively impact their performance and productivity. It was noted that both physical and psychological demands at work put the EMS personnel at risk of various mental

health conditions, including anxiety, burnout and post-traumatic stress (Jonsson, Segesten and Mattsson, 2003).

Other factors related to chronic work stress among EMS personnel include exposure to pathogens, being engaged in non-work related tasks, and injuries related to vehicle accidents (Donnelly, 2010). The mental wellbeing of the EMS personnel is significantly influenced by the general work condition, in particular, the perceived level of support from managers (Petrie *et al.*, 2018b).

2.7 Mental health help-seeking attitudes among EMS workers

The willingness to take up support offered or seek support is also a factor that needs to be considered. The theory of planned behaviour (TPB) by Ajzen (1991) has been employed to explain factors that may influence help-seeking behaviour. TPB suggests that the intention to engage in certain behaviour, such as help-seeking for mental health problems, can be influenced by three different factors: attitude towards the behaviour, perceived or subjective social norms, and perceived control over the behaviour. Overall, an individual is likely to seek help if positive beliefs outweigh negative beliefs, such as concerns about stigma (Britt and McFadden, 2012). In addition, help will be sought depending on perceptions about what other significant individuals, such as co-workers and supervisors, think about the behaviour. Therefore, on the basis of TPB, intentions to seek mental health help are likely stronger when the affected individual holds a positive attitude towards help-seeking, when other important individuals are supportive of help-seeking, and when the individual believes they have control over resources required to attain help (Britt and McFadden, 2012).

Application of TPB in the context of EMS workers reveals several barriers to help-seeking. Britt and McFadden (2012) found that employees in high-stress occupations such as EMS workers tend to prefer handling problems on their own as a way of demonstrating resilience. However, this makes it difficult for individuals to admit to a mental health problem and seek necessary help. Social norms also tend to be negative in emergency response occupations and act as deterrents for seeking psychological help (Britt and McFadden, 2012). Reed (2016) found the presence of a culture in which EMS workers tend to be immersed in attitudes that create defensive toughness, which in turn leads to resistance towards seeking psychological support. The EMS profession is characterised by an attitude of masculine stereotypes, in which EMS workers experience negative peer pressure and embarrassment to seek psychological help for mental health problems (Reed, 2016; Auth *et al.*, 2022).

Moreover, a Norwegian study that investigated help-seeking of EMS workers (Sterud *et al*., 2008a)

established that male-dominant occupations such as ambulance services and police departments were characterised by a culture that discouraged individuals from admitting mental health problems, leading to under-recognition of problems and lower propensity to seek help. This was affirmed by Clompus and Albarran (2016) who found that the culture of EMS resulted in shame around talking about emotions.

Exposure to traumatic experiences also appears to have an influence on help-seeking attitudes and behaviours. Kerai *et al.* (2017) found that EMS workers with PTSD in Pakistan showed negative coping mechanisms, such as avoidance (detachment from surroundings), self-blame and substance use. Porter (2013) and Britt and McFadden (2012) similarly highlighted alcohol use and social withdrawal as common practices among individuals in high-stress occupations. This suggests that a significant proportion of EMS workers may engage in maladaptive practices when faced with post-traumatic stress, rather than seeking formal or informal help. Britt and McFadden (2012) nonetheless noted that severe mental health symptoms arising from exposure to traumatic events often leads workers to seek mental health treatment. In other words, workers are likely to wait until symptoms are severe before seeking help.

2.8 The impact of post-traumatic stress on the service delivery

Adriaenssens, de Gucht and Maes (2012) noted that frequent exposure to traumatic events could lead to post-traumatic stress, and this could negatively affect the quality of prehospital emergency care. Another study conducted by Gallagher and McGilloway (2008) revealed the effect of critical incident stress on the emotional wellbeing of the ambulance workers, thus affecting their overall health. As a consequence, affected workers may demonstrate negative attitudes and/or behaviours towards their patients (de Boer *et al*., 2011). A study of emergency medical professionals in the US found that acute stress associated with dealing with paediatric emergencies had an impact on patient safety (Guise *et al*., 2017). This was affirmed by de Boer *et al*. (2011), who indicated that providing treatment during critical cases contributed to anxiety and post-traumatic stress reactions. Furthermore, Al Enazi and AlEnzie (2018) found that occupational stress (acute and chronic) negatively affected the wellbeing of EMS workers, hence impacting their performance and patient service delivery. The correlation between post-traumatic stress and the quality of care was also affirmed by Cushman *et al.* (2010) who noted that acute stress and anxiety among less experienced EMS workers was also associated with increased medical errors. Increased medical errors affect the quality of services and endanger patients. Post-traumatic stress that is characterised by arousal, upsetting feelings, sleep deprivation and avoidance could eventually lead to the provider harming the patient when providing care

(Adriaenssens, de Gucht and Maes, 2012; Müller-Leonhardt *et al.*, 2014).

The issue of post-traumatic stress and the extent to which it affects the provision of emergency services was equally discussed by Adriaenssens, de Gucht and Maes (2012). They reported that elevated levels of acute stress hindered the decision-making process, hence affecting performance and the quality of the services delivered. In that study, burnout was related to frequent exposure to distressing events and little recovery time between those events. Burnout could have an impact on the psychological wellbeing of the healthcare provider, their level of job satisfaction, and the quality of care (Leiter, Harvie and Frizzell, 1998). Therefore, exposure to traumatic incidents must be controlled to ensure that EMS workers can successfully deliver their services to the required quality levels.

With regard to the effect of acute stress on decision-making, Regehr and Leblanc (2017) in their study of first responders revealed that although PTSD had no effect on highly trained tasks, it increased the risk of making a poor professional judgment. This is because acute stress has a direct effect on performance in complex cognitive duties performed in fast-paced situations, resulting in an increase in clinical errors and poorer functioning, with all these factors affecting the quality of the decision-making process. Support for EMS workers should therefore consider not only the technical skills needed for their roles, but also support in managing post-traumatic stress at work.

The relationship between post-traumatic stress and performance is multifaceted (Regehr and LeBlanc, 2017). PTSD may have an effect on risk assessment in settings that require professional judgment (Regehr and LeBlanc, 2017). This is a critical factor that influences aspects of decision-making, particularly for EMS workers.

2.9 Post-traumatic growth and resiliency

While most studies have focused on negative psychological outcomes of post-traumatic stress in EMS workers, some have found positive implications. Research has shown that experiencing a traumatic event could lead to positive psychological changes, known as post-traumatic growth (PTG) (Tedeschi and Calhoun (2004). PTG has been proposed as a positive psychological outcome of traumatic incidents, consisting of reforming the personnel' perception and providing them with a new way of positively perceiving life and dealing with its challenges (Tedeschi and Calhoun, 1996; Bauwens and Tosone, 2010; Picoraro *et al.*, 2014).

Tedeschi and Calhoun (2004) identified PTG as a different concept from resiliency. They argued that PTG is an outcome of the negative reactions experienced following a traumatic event, while

resiliency allows individuals to cope well with the traumatic event itself. The authors suggested a model for PTG that incorporates five areas: increased appreciation of life, enhanced relationships with others, greater perception of the personnel's own strength, identifying new pathways for growth, and spiritual development. This was also affirmed by Shakespeare-Finch *et al.* (2003), who suggested that exposure to traumatic events could positively contribute to an improved sense of appreciation of life, enhanced interpersonal relationships and recognition of new opportunities. However, other have argued that PTG is a psychological adaptation to the trauma through creating positive appraisals, or making meaning of the traumatic experience (Davis, Nolen-Hoeksema and Larson, 1998).

According to Ogińska-Bulik (2015), the effects of traumatic experiences are not entirely negative and not all individuals require help following a traumatic event. Rather, this depends on a range of variables, such as individual characteristics, level of social support and the type of critical incident that was experienced (Tedeschi and Calhoun, 2004; Ogińska-Bulik, 2015). In addition, Arnold *et al.* (2005) identified the concept of vicarious post-traumatic growth (VPTG) as the experience of growth that is developed by a person who has been indirectly affected by trauma, such as those caring for severely traumatised people. Studies demonstrated the effects of VPTG as positive changes in viewing life, positive relationships with others, and a greater appreciation of oneself and others, aspects that are similar to the effects of PTG (Arnold *et al.*, 2005; Calhoun *et al.*, 2010).

Literature on resiliency has shown its vital role in reducing the negative consequences of traumatic events. Pietrantoni and Prati (2008) reported that the exposure of first responders to hazardous environments prompted these individuals to develop positive personal resources, such as resiliency. According to Ogińska-Bulik and Kobylarczyk (2015), the higher the resiliency exhibited by EMS workers, the more mental health benefits they might gain from experiencing trauma. In addition, Ogińska-Bulik (2015) found that positive outcomes from trauma, such as PTG and resiliency, can be obtained with social support. That study highlighted the role of social support in acquiring benefits from traumatic incidents. Therefore, social support could act as a moderating factor between post-traumatic stress and resiliency, since resiliency could develop following trauma when sufficient social support is provided or acquired (Ogińska-Bulik, 2015).

Furthermore, a study of Chinese EMS workers found that the detrimental consequences of trauma could be mitigated through social support and interventions to strengthen resiliency, as a way of promoting VPTG (Kang *et al.*, 2018). That study indicated that improving worker resilience had a positive implication in reducing PTSD and improving VPTG through the mediating role of social

support. In addition, Tedeschi and Calhoun (1996) noted that coping strategies associated with enhancing resiliency can help in the development of VPTG. Social support could be considered a coping strategy. Similarly, Ogińska-Bulik and Kobylarczyk, (2015) found that resiliency played a role in the appearance of positive post-traumatic changes among EMS workers, and that it mitigated post-traumatic stress through favouring the choice of constructive coping strategies. Conversely, Alexander and Klein (2001) noted that while EMS workers had high resiliency levels, this did not always act as a protective factor against post-traumatic stress.

Moreover, although EMS personnel encounter traumatic events frequently, the prevalence of PTSD among them is low when considering their regular exposure to critical incidents (Streb, Häller and Michael, 2014). This leads to question whether EMS staff have high resiliency levels or prefer to avoid disclosing such information (in self-reported studies) due to fear of confidentially-related or stigma-related issues. Alternatively, could it be because they have in fact suffered from symptoms of PTSD but not full PTSD, which therefore masked their post-traumatic symptoms.

While many studies emphasise the occurrence of PTG, they lack evidence to support the existence of this concept and to identify its predictors. Most of these studies included self-reported measures, whereby participants reported that their views about life had positively changed after a traumatic event and that the experience had made them a better person. These participants could be argued to consider positive appraisal as a way of coping with post-traumatic stress, which was suggested by some researchers (Shepherd and Wild, 2013; 2014). Hence, it could be that these positive appraisals made them believe that they had developed positive psychological growth, whether or not they actually developed positive outcomes. This was acknowledged by a longitudinal study of undergraduate students that revealed a difference between the individuals' perceptions of growth and factual growth (Frazier *et al.*, 2009).

Moreover, with regard to the effect of trauma on enhancing interpersonal relationships. It could be that affected individuals could have felt the need to seek help throughout social support from friends and family following encountering a traumatic event, leading them to strengthen their relationships, especially with close ones. Indeed, other studies have evidenced the positive influence of social ties and support on the individual's mental and physical health (Cobb, 1979; Cohen and Wills, 1985; Thoits, 1995; Uchino, 2006).

2.10 Theoretical model for post-traumatic stress in EMS personnel

Figure 2 below presents a theoretical model that has evolved as conducting this narrative review. This model is not the first illustration of the review's findings, as several models were made before

developing this one. Initial models were broader in terms of research focus and hence some of the elements were excluded (to be in line with the research focus).

The model starts with demonstrating the factors that contribute to the development of post-traumatic stress among EMS personnel. These factors were divided into pre-trauma (before the traumatic incident), trauma (during the traumatic incident) and post-trauma (after the traumatic incident) factors. The pre-trauma factors refer to the factors that the EMS individuals experienced at workplace also called organisational factors (e.g. lack of supportive work environment) and factors that are related to individuals' characteristics (e.g. personality traits). It is also worth noting that some of these risk factors were not strongly associated with PTSD development, such as age and gender (as per the evidence from this review). Then, the model presents the trauma factors, these are factors related to the incident itself such as the type of incident (e.g. cases involve children) and the EMS personnel reaction to it (e.g. feeling helpless) which have been evidenced to increase the risk of PTSD symptoms. After exposure to a critical incident, there comes the second part of the model which is the post-trauma factors. These are factors that could either worsen or alleviates post-traumatic stress following experiencing a distressing event. For instance, the provision of sufficient social support or using constructive coping strategies at this stage may help prevent the EMS personnel from developing severe post-traumatic stress symptoms (characterised as ASD), therefore reducing the risk of developing PTSD.

In examining the effect of post-traumatic stress on service delivery, it was crucial to explore how the attitudes and behaviours of EMS personnel are influenced by post-traumatic stress. For instance, as discussed earlier, studies have shown that PTSD can affect the performance of EMS personnel, potentially influencing their decision-making processes and thereby increasing their risk of making medical errors (Regehr and Leblanc, 2017). Another example of potential staff performance deterioration stems from the influence of post-traumatic stress on their attitudes towards patients. This can negatively affect their communication skills, leading to a perceived lack of empathy towards their patients (Hall *et al.*, 2016). Such changes can, in turn, adversely impact the quality of care provided.

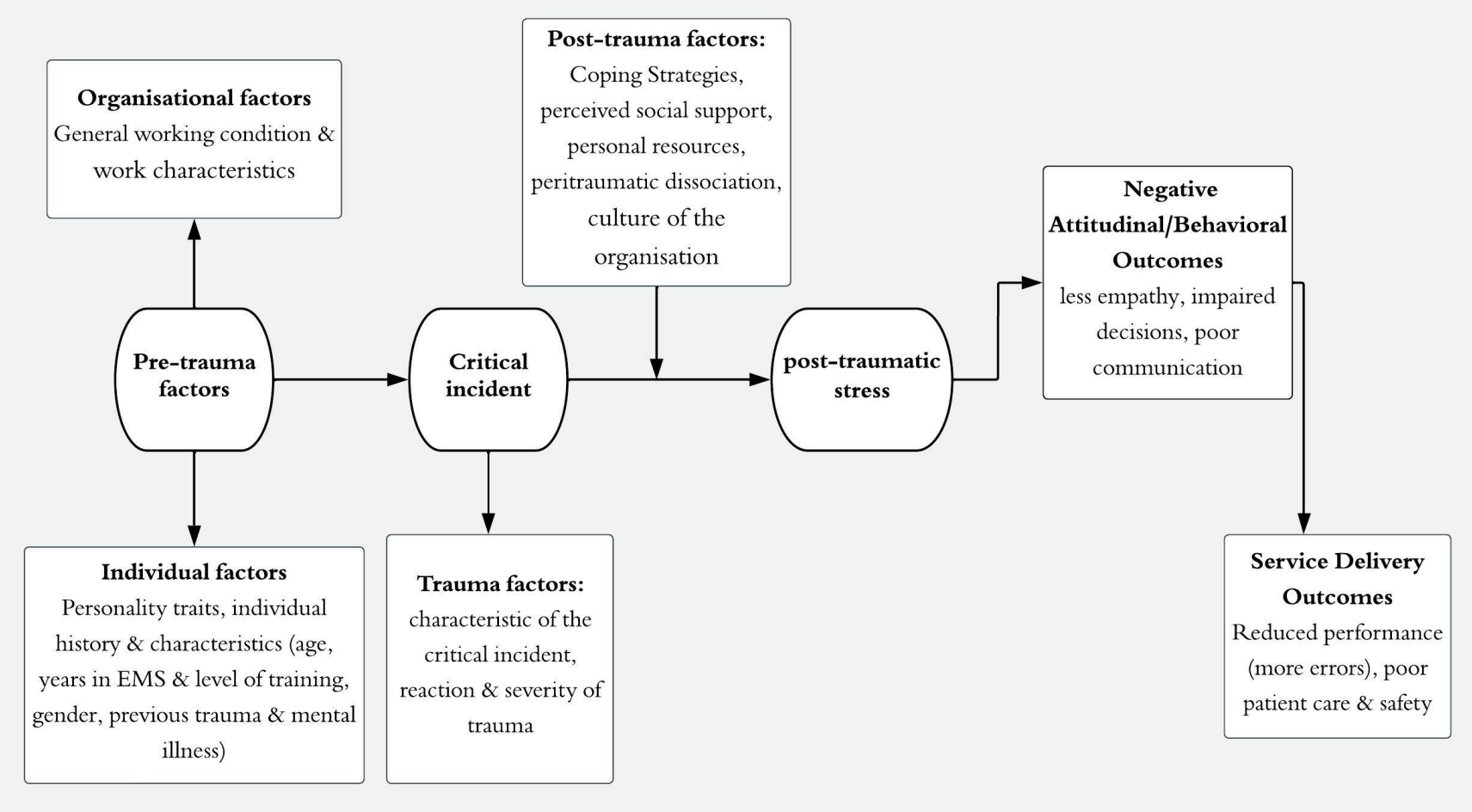


Figure 2: Theoretical model for post-traumatic stress in EMS personnel.

CHAPTER 3: INTERVENTIONS AIMED AT REDUCING OR PREVENTING POST-TRAUMATIC STRESS IN EMS PERSONNEL: A SYSTEMATIC REVIEW

3.1 Introduction

EMS workers are at increased risk of developing PTSD due to their frequent exposure to traumatic events (Berger *et al*., 2012; McFarlane and Bryant, 2007; Donnelly and Siebert, 2009; Mishra *et al*., 2010; Newland *et al*., 2015; Boland *et al*., 2018). A meta-analysis conducted by Petrie *et al.* (2018a) found a high prevalence of PTSD and other mental health conditions among EMS workers, estimating the prevalence of PTSD among this group at approximately 11%. PTSD has been linked to serious mental health behaviours, such as excessive alcohol consumption and increased risk of suicide (Nakao, Yamanaka and Kuboki, 2002; Thoresen and Mehlum, 2006; Jones *et al*., 2018). EMS personnel experience a higher rate of suicidal thoughts and suicide attempts than the general public (Newland *et al*., 2015).

Due to the difficult roles of EMS personnel, it is important to understand which types of interventions are effective in preventing and treating post-traumatic stress (ASD or PTSD). It is difficult to draw an absolute conclusion from a single-intervention study to identify which intervention is the most effective for this population. To my knowledge, only one review has been published evaluating the effectiveness of interventions in ambulance personnel as a distinct occupational group (Smith and Roberts, 2003). The review concluded that intervention studies for ambulance personnel were lacking in quality due to methodological deficits, as the studies self-selected participants and did not include information about the timing of interventions (Smith and Roberts, 2003). Of all the studies included, none of them was a randomized controlled trial on the target population.

A recent systematic literature review that explored the effectiveness of interventions aimed at reducing PTSD, depression, and other mental health problems in first responders (police officers, firefighters, and paramedics) reported that psychological treatments, especially cognitive behavioural therapy (CBT), were effective in reducing the levels of PTSD. According to the findings of the review, the use of psychological interventions, such as CBT and Eye Movement Desensitization and Reprocessing (EMDR), helped to reduce PTSD levels among first responders. Furthermore, the study highlighted that CBT resulted in the most significant decline in PTSD compared with other psychological interventions (Alshahrani *et al*., 2022).

Nevertheless, it is worth noting that Alshahrani *et al.*'s (2022) review only included 2 studies in

the field of EMS (involving paramedics) out of 15 included studies. The studies included in the review mainly focused on police officers, firefighters, and other emergency rescuers (mix of first responders). The review did not include any RCTs conducted on ambulance workers. The authors argued that more studies regarding psychological interventions for ambulance workers should be conducted (Alshahrani *et al*., 2022), especially because past research evidenced the high prevalence rate of PTSD among this group of professionals compared with other first responders, such as law enforcement and firefighters (Berger *et al*., 2012). Moreover, Alshahrani *et al.* (2022) emphasised a lack of high-quality studies related to interventions for treating PTSD in first responders, especially in the EMS. Despite past research highlighting the effectiveness of certain interventions in treating PTSD in first responders, it is impossible to determine whether the effect sizes are similar for EMS and other first responders. The replication of interventions developed for police officers and firefighters does not guarantee favourable results for use in EMS populations. Furthermore, it remains unclear whether extrapolating evidence from trials among other first responders to the EMS workforce is valid.

In addition, further studies including prospective designs are needed. The rapid overview conducted by Antony *et al.* (2020) demonstrated a considerable lack of research dedicated to PTSD prevention and treatment in paramedics. Most existing studies investigated primary interventions applied to police and firefighter populations and disregarded the impact of PTSD and occupational stress injury on EMS personnel (Antony *et al*., 2020; Alshahrani *et al*., 2022). Several studies have proposed that post-traumatic stress patterns in EMS workers are similar to those in other first responders (Carleton *et al*., 2018); however, additional research is needed to provide evidence for this hypothesis. Moreover, cultural and indigenous methods of post-traumatic stress (ASD and PTSD) treatment have not been adequately researched or discussed in the psychology literature (Bryant-Davis, 2019).

Psychological interventions can be classified into two groups: (1) those that prevent the emergence of mental health conditions (e.g., strategies aimed at inducing resilience and stress management skills), which usually target individuals who are considered at risk; and (2) those that can be used to treat incident or prevalent mental health conditions (e.g., psychotherapy and pharmacological interventions) (Purgato *et al.,* 2020).

The primary aim of this review was to explore the effectiveness of worldwide interventions aimed at reducing or preventing post-traumatic stress (ASD and PTSD) in EMS workers. The second aim was to determine whether intervention type, target group, and study setting are associated with the outcomes. The findings of this review will inform the feasibility of tailoring these

interventions and the possibility of modifying specific aspects of these interventions to make them acceptable within the context of the UAE.

3.2 Aim

The purpose of this review was to identify and synthesise literature concerning interventions for treating or preventing ASD or PTSD among EMS personnel. This analysis will help to identify the types of effective interventions and the key principles that shape these interventions. The findings will also be compared with evidence about the effectiveness of interventions in (other) first responders.

3.3 Objective

The following objectives guided the investigation:

- To complete a systematic search of published literature of worldwide interventions aimed to treat or prevent ASD and PTSD in EMS personnel

The review questions were:

1. What type of interventions have been evidenced to be effective in treating or preventing post-traumatic stress among EMS workers?
2. For which conditions do these interventions work best (e.g., ASD, PTSD or delayed onset of PTSD)?

3.4 Methods

3.4.1 Study design

A systematic literature review was conducted to identify and synthesise literature relating to interventions for treating or preventing ASD or PTSD among EMS personnel.

3.4.2 Inclusion and exclusion criteria

Population: This review considered interventions for EMS personnel. EMS personnel are defined as paramedics and EMTs of any age who provide prehospital emergency care in ambulance services. Studies that focused on retired EMTs/paramedics, emergency medical dispatchers, volunteer EMTs/paramedics, or paramedic/EMT students were excluded as the focus is on currently employed EMS professionals who have been dealing with critical incidents throughout their career. In addition, studies that focused only on other emergency responders, such as police officers or firefighters, were excluded because the focus of this study is on EMS organisations.

Firefighters whose role doubled as medics/paramedics were included, as part of their job involves dealing with and treating injuries. Studies dealing with first responders in general were included if EMS workers were examined as part of the considered population. In this case, I sought to use those only data concerning the EMS personnel subgroup (when a study treated EMS personnel as a discrete group).

3.4.3 Interventions

The interventions of interest were those aimed at treating or preventing post-traumatic stress, including ASD and PTSD (either partial or full PTSD), in EMS personnel. This included interventions to reduce or treat post-traumatic symptoms, such as psychotherapeutic treatments (e.g., CBT), psychological debriefing (e.g., critical incident stress management), and preventive interventions (e.g., resiliency training), which were perceived in this review to be strategies that aimed to decrease the risk of developing post-traumatic stress. If an intervention was not clearly described as aiming to treat or prevent post-traumatic stress among this population (i.e., intending to mitigate work-related stress without specifying the type of stress), the study authors were contacted for further clarification. Pharmacological interventions were excluded because the focus is on interventions that do not involve the use of drugs.

3.4.4 Outcomes

The primary clinical outcome of interest was a change in the level or severity of ASD or PTSD symptoms (for treatments) or no development of post-traumatic stress (for prevention interventions), which were appraised using a standardised validated assessment tool (either self-administered or clinician-administered questionnaire). Examples include the Post-Traumatic Symptom Scale (PTSS-10) developed by Holen, Sund and Weiseath (1993) and the Post-Traumatic Stress Diagnostic Scale (PDS) developed by Foa et al. (1997). Secondary outcomes of interest included a reduction in the duration and/or the prevalence (fewer cases) of PTSD/ASD symptoms.

3.4.5 Types of studies included

This review included RCTs and observational studies that evaluated the effectiveness of interventions for treating or preventing post-traumatic stress in EMS workers. The reference lists of previous reviews were examined to identify eligible primary studies for inclusion. Studies that focused on PTSD/ASD in addition to other psychological disorders, such as anxiety and depression, were also included. Evaluation reviews (secondary data) and single-case studies were excluded because the focus of the present study is on empirical studies and studies that are

not limited to a single individual.

3.4.6 Search strategy

A search strategy was designed to identify published studies. Articles on human subjects published in the English language, not restricted to a specific country, and indexed in four databases (Ovid PsycINFO, Ovid MEDLINE, EBSCOhost CINAHL, and Web of Science (WOS)) were searched. I did not apply a limitation on the year of publication, and the reference lists of similar reviews were searched. Truncation was performed with the aim of broadening the search and to incorporate all the available words that had a similar beginning and varying endings. In addition, Boolean search terms were applied to the databases using the operator 'AND' to search for key words referring to post-traumatic stress, EMS, and interventions, while the operator 'OR' was used to include either of the terms related to these three key words. The search took place between January and April 2020.

The search terms included 'emergency medical technician', 'EMT', 'ambulance', 'EMS', 'paramedic', 'emergency medical service', 'post-traumatic stress', 'post traumatic stress', 'posttraumatic stress', 'PTSS', 'PTSD', 'acute stress', 'critical incident stress', 'prehospital', 'pre-hospital', 'CISD', 'debriefing', 'CISM', 'psychological first aid', 'stress management', 'support service', 'mental health service', 'consultation', 'training', 'desensitization', 'EMDR', 'medication', 'drug', 'prolonged exposure', 'exposure therapy', 'cognitive therapy', 'CBT', 'cognitive behavioural therapy', 'CPT', 'cognitive processing therapy', 'treatment', 'intervention', 'psychotherapy', and 'therapy'. Screenshots of the searches are included in Appendix 1.

3.4.7 Study selection

All the identified citations were uploaded in Mendeley, and duplicates were removed after the search. The data required for the current analysis were extracted independently by me. Titles were screened and abstracts were extracted from the selected databases using the inclusion criteria. I evaluated the full text of the selected citations in detail. Full-text studies that did not meet the inclusion criteria were reported in the systematic review along with the reason for their exclusion. Finally, the results of each selected study and the inclusion process were recorded and presented using the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) flow diagram (Moher *et al.,* 2009).

3.5 Risk of bias

The Cochrane Collaboration Risk of Bias Tool was used to evaluate the methodological quality of

the included RCTs (Higgins *et al*., 2011). This tool evaluates RCTs along six dimensions: selection, performance, detection, attrition, reporting, and other potential biases that do not fit within the first five dimensions. Studies were evaluated as having a 'high', 'low', or 'unclear' risk of bias along each of these dimensions. Studies in which none of the dimensions were considered a high risk of bias and in which three or fewer of the areas were considered 'unclear' were classified as having an overall low risk of bias. Studies in which one category was rated 'high' or in which four or more categories were considered 'unclear' (even if none of the categories were rated 'high') were classified as having a moderate risk of bias. All other studies were judged as having a high risk of bias (Higgins *et al*., 2011).

Non-RCTs were appraised for risk of bias using the Risk Of Bias In Non-Randomized Studies - of Interventions (ROBINS-I) tool (Sterne *et al.* 2016). The ROBINS-I tool assesses the following domains: confounding, selection, intervention classification, deviation from intervention, missing data, measurement of outcome, and selection of reported result. The categories assigned by this tool were 'low' (the study is comparable to a high-quality RCT regarding the specific area of bias), 'moderate' (the study is comprehensive for a non-RCT in the area of bias but cannot be compared to a high-quality RCT), 'serious' (the study has some important issues in this area of bias), 'critical' (the study is extremely problematic in this area of bias), and 'no information' (the study does not provide sufficient information for judgement of the risk of bias in the specific area) (Sterne *et al.* 2016).

3.6 Data extraction

Information about study details (author(s) and year of publication), characteristics of the study (study design, country, demographic details of the participants, sample size and recruitment procedure), nature of the intervention, and outcomes (timing of measurement and the scale/study tool used to measure outcomes) was extracted manually by me and reviewed by my supervisors. The authors of the studies were contacted for missing data, where it was required.

3.7 Data synthesis

After attentive and careful reading of the studies selected for this review, the relevant data regarding the characteristics, context, and quality of these studies were summarised using narrative and tabular approaches (See table 1). Tabular presentation was used for the assessment of methodological quality and to group the data into discrete categories, such as study location, study design, participants' characteristics, nature of the intervention/comparator,

characteristics of the critical incident, study tool, and outcomes. Moreover, I used the narrative approach to provide an inclusive summary of the interventions.

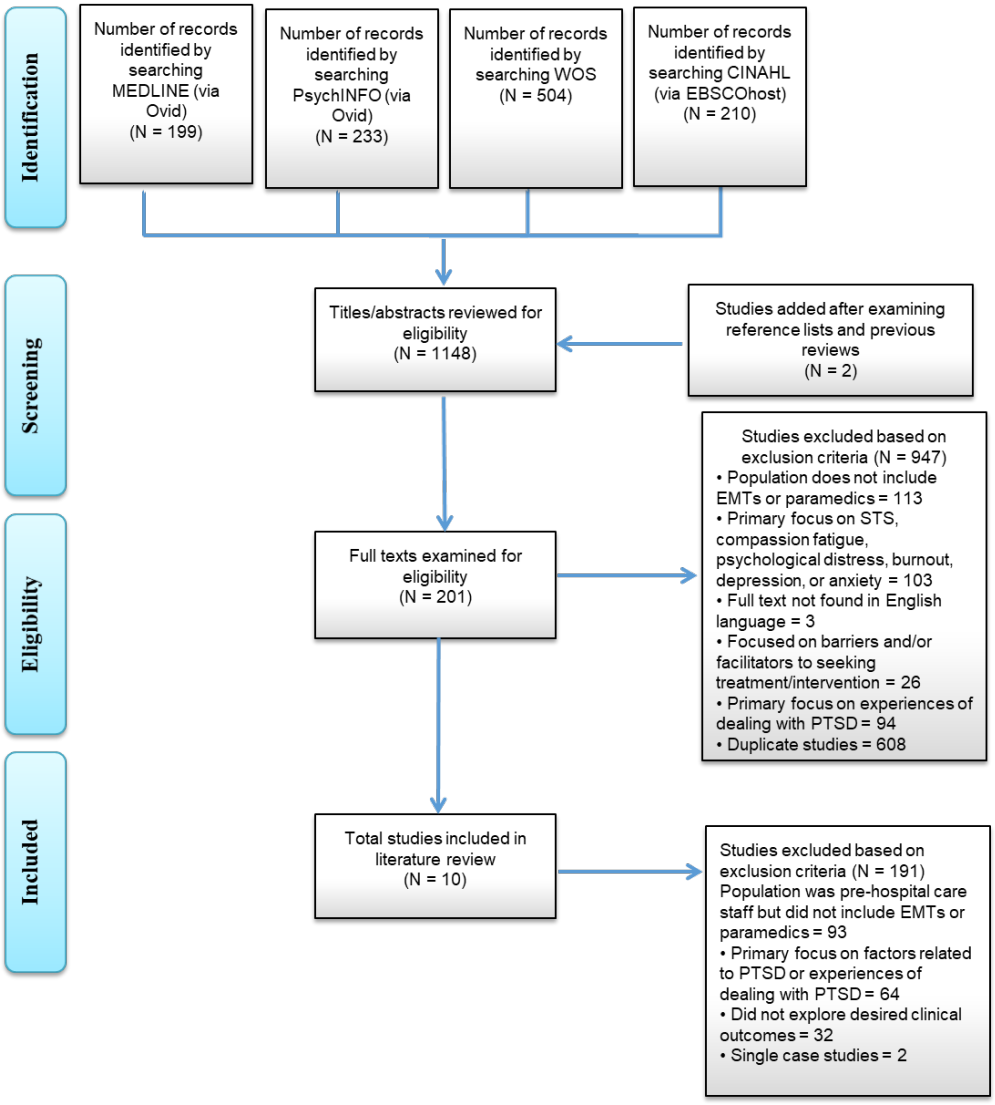


Figure 3: PRISMA flow chart of study identification and selection process.

3.8 Results

Table 1: Summary of studies included in the systematic review

Author (year)/Location	Methods	Participants	Response Rate	Characteristics of Critical Incident	Type of Intervention/ Intervention Group	Timing of Measure	Control/ Comparison Group	Conditions Assessed	Results
1) Wesemann et al. (2020)/Germany	Cross-sectional (pilot) study	55 emergency responders (EMTs, police officers, firefighters, soldiers, dispatchers and non-governmental organisation employees) who responded to a terror attack in Berlin in 2016	Not indicated	Terror attack	CISD (*n* = 37)	A self-reported questionnaire (PCL-5) was completed 4 months following the incident; no baseline measures were given	Did not participate in the CISD (*n* = 18)	PTSS, stress, psychiatric disorders and psychological quality of life	There was an increase in the level of PTSS among male participants who received the CISD intervention (t[39] = 2.23, *P* = 0.026) compared with those who did not

Author (year)/Location	Methods	Participants	Response Rate	Characteristics of Critical Incident	Type of Intervention/ Intervention Group	Timing of Measure	Control/ Comparison Group	Conditions Assessed	Results
2) Halpern et al. (2014)/Canada	Cross-sectional study	201 paramedics and EMTs (including supervisors)	38.3%	Any incident that had been disturbing to the participant in the past or was still disturbing to them at the time of the study	Downtime following a traumatic incident (*n* = 147): 36 participants received less than 30 min, 54 received 30–120 min, 24 received the remainder of their shift and 33 received 1 day or more	A self-reported questionnaire (IES-R) was disseminated that required participants to provide information at 2 different time points: following the distressing incident and at the time of questionnaire completion	Did not receive downtime (*n* = 54)	PTSS, depression, burnout and stress-related physical symptoms	PTSS was not significantly correlated with receiving downtime (any downtime: 0.71 ± 0.59; no downtime: 0.78 ± 0.61; *P* = 0.48)

Author (year)/Location	Methods	Participants	Response Rate	Characteristics of Critical Incident	Type of Intervention/ Intervention Group	Timing of Measure	Control/ Comparison Group	Conditions Assessed	Results
3) Warren (1997)/USA	Cross-sectional study (dissertation)	80 EMTs and paramedics. Participants were divided into 3 groups: Group 1 (who dealt with the accident and attended the CISD), Group 2 (who dealt with the accident but did not attend the CISD) and Group 3 (who neither dealt with the accident nor attended the CISD)	Not indicated	A motor vehicle accident that resulted in 17 deaths and more than 100 injures	CISD: One debriefing was held 72 hrs after the incident and another 5 days following the incident. Participants attended only one session (*n* = 9)	A self-reported questionnaire (CISD questionnaire) was administered approximately 2 months after the incident	Group 2, participants who attended the incident but did not participate in the CISD *(n* = 14)	Levels of PTSD and distress	No effect of the CISD intervention on the levels of PTSD was found: X^2 (1 , $\underline{N}$ = 23) = 0.49, *P* > 0.05

Author (year)/Location	Methods	Participants	Response Rate	Characteristics of Critical Incident	Type of Intervention/ Intervention Group	Timing of Measure	Control/ Comparison Group	Conditions Assessed	Results
4) Wee et al. (1999)/USA	Cross-sectional study	65 EMTs who attended the Los Angles Civil Disturbance incident. The mean FRI-A score for all participants was 12.01 (42.4% reported a mild-to-moderate degree of symptoms)	Of the 130 questionnaires sent, 65 responses were included in the study	The Los Angles Civil Disturbance in 1992, which occurred in different states and involved 51 deaths and more than 2000 injured persons	A CISD intervention, which was provided the day after the incident and continued for 13 days thereafter (*n* = 42)	A self-reported survey (FRI-A) was completed 3 months after the incident	Participants who did not attend the CISD (*n* = 23)	The occurrence of PTSS and the severity of PTSD	A decline in the severity of PTSD symptoms among those who participated in the CISD was found (*P* = 0.036, one-tailed), with a mean score of 10.78 (SD = 7.5), compared with those who did not participate in the intervention (mean = 14.31, SD = 6.9)

Author (year)/Location	Methods	Participants	Response Rate	Characteristics of Critical Incident	Type of Intervention/ Intervention Group	Timing of Measure	Control/ Comparison Group	Conditions Assessed	Results
5) Woods (2007)/USA	Cross-sectional study (thesis)	219 EMTs and paramedics. 16.4% of the sample had PTSD, and 20.5% had symptoms of PTSD (LASC results)	Not indicated	No specific incident	CISD	A self-reported questionnaire (LASC) was disseminated	Participants who did not participate in the CISD	The number of PTSD symptoms	Participants who underwent the CISD reported worse PTSD symptoms (M = 17.424, SD = 1.342) than participants who did not participate in the intervention (M = 13.299, SD = 1.300)

Author (year)/Location	Methods	Participants	Response Rate	Characteristics of Critical Incident	Type of Intervention/ Intervention Group	Timing of Measure	Control/ Comparison Group	Conditions Assessed	Results
6) van der Meer et al. (2020)/the Netherlands	RCT, but this was not a cross-sectional study since the survey was only used as a screening tool	287 healthcare workers (nurses, paramedics, ambulance drivers and physicians). Participants scored ≥ 1 in the PC-PTSD-5	24.4% of the initial 1175 participants met the inclusion criteria. The response rate was 86.7% (143 participants) for the intervention group and 93.8% (144 participants) for the control group	No specific time or type of incident. Participants were selected if they had experienced at least one traumatic symptom in the past month	SUPPORT Coach (a self-help mobile app) was used, with participants obtaining access thereto for 1 month (*n* = 124, 83 of whom were EMS personnel)	A self-reported questionnaire (PCL-5) was completed at baseline, post-intervention and the 1-month follow-up	This group had no access to the mobile app (*n* = 135, 88 of whom were EMS personnel)	Primary: one or more symptoms of PTSD Secondary: negative cognition, psychological resilience and social support	The intervention had no effect on the PTSD symptoms that participants experienced following the use of the SUPPORT Coach app. The difference in mean PCL-5 scores from baseline to post-intervention in the intervention group was -3.49 (control group -3.09). The mean PCL-5 score at the 1-month follow-up in the intervention group was -4.66 (control group, -4.32)

7) Bryant et al. (2019)/Australia	RCT	100 first responders (paramedics, police officers and firefighters) were divided among a CBT-L, CBT-B and waitlist (control) group. All participants had been diagnosed with PTSD according to *DSM-IV* criteria	While all 100 participants were randomized, some withdrew at various points during the study, resulting in a final sample size of 62	No specific type or time of the incident	CBT (long and brief exposure). CBT-L (*n* = 33): 40 min of imaginal exposure per session. CBT-B *(n* = 33): 10 min of imaginal exposure per session	Assessment through an interview (CAPS) was conducted before treatment, post-treatment and at a 6-month follow-up	Waitlist *(n* = 34): Individuals who were randomised to either the CBT-L or CBT-B group following the post-treatment assessment	Primary: severity of PTSD Secondary: depression, alcohol use, quality of life and cognition	There was a significant reduction in PTSD severity following both CBT therapy types in the post-treatment phase, with a noticeable interaction effect ($F47.25 = 20.04$, $P < 0.001$), compared with the waitlist group. PTSD severity significantly decreased from baseline to follow-up for both therapy types (CBT-L and CBT-B), with effect sizes of 1.7 and 1.6, respectively. There was no significant difference between the

Author (year)/Location	Methods	Participants	Response Rate	Characteristics of Critical Incident	Type of Intervention/ Intervention Group	Timing of Measure	Control/ Comparison Group	Conditions Assessed	Results
									CBT-L and CBT-B groups at the follow-up
8) Macnab et al. (1999)/Canada	Cross-sectional study	18 paramedics, 35 physicians, 47 nurses and 32 emergency hospital staff whose colleagues had been killed in the incident	Response rates were 90% for paramedics, 83% for physicians, 78% for nurses and 80% for emergency staff	An air ambulance crash that killed 2 paramedics, 2 pilots and a doctor	CISD	A self-reported survey was sent at 2 time intervals: 6 months and 2 years following the incident	None	Severity of PTSD symptoms	No effect of the frequency of CISD sessions was found on the severity of PTSD symptoms (r^2 = 0.12 at 1 day, 0.08 at 1 month and 0.01 at 6 months)

Author (year)/Location	Methods	Participants	Response Rate	Characteristics of Critical Incident	Type of Intervention/ Intervention Group	Timing of Measure	Control/ Comparison Group	Conditions Assessed	Results
9) Jarero et al. (2013)/Mexico	RCT	15 paramedics, 15 dispatchers and 9 firefighters. The average SPRINT score for all participants was > 14 (moderate PTSD symptoms)	Not indicated	No specific type or time of the incident. Participants were asked to identify a distressing incident that had occurred in the past 3 months	EMDR-PROPARA *(n* = 19)	A self-reported questionnaire (SPRINT) was used to measure symptoms at 4 different time points: baseline, after the intervention, at a 1-month follow-up and at a 3-month follow-up	Supportive counselling *(n* = 20)	The severity of or acute PTSD symptoms (< 3 months) and subjective global improvement	There was a significant decrease in the severity of recent PTSD symptoms over time in the EMDR-PROPARA group compared with the supportive counselling group. The mean score at the 3-month follow-up in the EMDR group was 2.36 compared with 16.15 in the counselling group

Author (year)/Location	Methods	Participants	Response Rate	Characteristics of Critical Incident	Type of Intervention/ Intervention Group	Timing of Measure	Control/ Comparison Group	Conditions Assessed	Results
10) Jarero, Schnaider and Givaudan (2019)/Mexico	RCT	17 paramedics, 7 emergency nurses and 36 firefighters. The average PCL-5 score for all participants was between 38 and 40	Of the 92 potential participants, 60 were included in the study	No specific type or time of the incident. Participants were asked to identify a specific event that distressed them most at the time of the study, so participants reported different critical incidents	EMDR-PRECI (*n* = 30)	A self-reported questionnaire (PCL-5) was used to measure symptoms at 3 time intervals: baseline, after the intervention (10–12 days after the treatment day) and at a 3-month follow-up	No treatment (*n* = 30)	The severity of PTSD symptoms, anxiety and depression	There was a significant decrease in the severity of PTSD symptoms in the EMDR-PRECI group. The reduction in symptoms was maintained at the follow-up, suggesting a significant effect size (*d* = 3.99)

A total of 1148 studies were identified from the four electronic databases. Following title and abstract screening, 947 studies were excluded based on the study selection criteria. Full-text assessment of 201 studies resulted in the inclusion of 10 studies for this review (six surveys and four RCTs). The reasons for exclusion of the remaining studies (n = 1138) based on title, abstract, and full-text screening are presented in the PRISMA flow diagram (Figure 3).

3.8.1 Study characteristics

Among the 10 selected studies, six were cross-sectional studies (Warren, 1995; Macnab *et al*., 1999; Wee *et al*., 1999; Woods, 2007; Halpern *et al.*, 2014; Wesemann *et al*., 2020) and four were RCTs (Jarero *et al*., 2013; 2019; Bryant *et al*., 2019; van der Meer *et al*., 2020). Three of the studies included in the review were conducted in the United States (Warren, 1995; Wee *et al.*, 1999; Woods, 2007), two were conducted in Canada (Macnab *et al*., 1999; *Halpern et al.*, 2014), and two were conducted in Mexico (Jarero *et al*., 2013; Jarero *et al*., 2019). One study was conducted in the Netherlands (van der Meer *et al*., 2020), one in Australia (Bryant *et al*., 2019), and one in Germany (Wesemann *et al*., 2020). Table 1 above summarises the included studies.

3.8.2 Participants' characteristics

Among the 10 studies (n = 1238 participants) that were selected for this systematic review, four studies focused only on EMS personnel, a population that included EMTs, paramedics, or both (Warren, 1995; Wee *et al*., 1999; Woods, 2007; Halpern *et al*., 2014). The remainder of the studies (n = 6) recruited samples that included other emergency first responders in addition to EMS workers, including police officers, firefighters, and dispatchers (Jarero *et al*., 2013; 2019; Bryant *et al*., 2019; Wesemann *et al*., 2020). Healthcare professionals, such as physicians and nurses, were also included in the pool of practitioners in some of the reviewed studies (Macnab *et al.,* 1999; Jarero *et al*., 2019; van der Meer *et al*., 2020). Only two of the studies that included other emergency responders (in addition to EMS staff) referred to EMS personnel as a distinct group when examining the effect of interventions on post-traumatic stress levels (Macnab *et al*., 1999; Wesemann *et al*., 2020). Despite having other first responders, this review focused on the findings of the included studies since they apply to all first responders despite the specific line of profession (except for the two studies that treated EMS as a distinct group). Thus, the findings from these studies were not treated in any special manners besides focusing on the efficacy of the treatments recommended thereof.

3.8.3 Risk of bias

The randomised-control trials (RCTs) were assessed for risk of bias using the Cochrane

Collaboration Risk of Bias Tool (Higgins *et al*., 2011). Two of the studies (Bryant *et al*., 2019; Jarero *et al*., 2019) were judged as having a low overall risk of bias, while two other studies (Jarero *et al*., 2013; van der Meer *et al*., 2020) were judged as having a moderate risk of bias (Appendix 3).

In contrast, the observational studies were assessed using the ROBINS-I tool (Sterne *et al*., 2016). Assessment of the risk of bias using this tool indicated that two of the studies had a serious overall risk of bias (Warren, 1995; Halpern *et al*., 2014). Two other studies (Wee *et al*., 1999; Woods, 2007) had a moderate overall risk of bias. One study (Macnab *et al*., 1999) had a low overall risk of bias, and one study was judged provided insufficient information (Wesemann *et al*., 2020) (Appendix 4).

3.8.4 Clinical outcomes and study tools

Of note, all the studies focused on PTSD (either partial or full PTSD) as the primary condition being assessed and none focused on ASD. Full PTSD is diagnosed when a person meets the criteria for a positive PTSD diagnosis outlined in the DSM-5 (American Psychiatric Association, 2013). Partial PTSD is diagnosed when a person exhibits at least one symptom in each of the PTSD symptom clusters B, C, D, and E, with these symptoms lasting for at least 1 month after encountering a traumatic event (Stein *et al*., 1997; 2002; Breslau, Lucia and Davis, 2004). Several of the reviewed studies examined additional mental health conditions as outcomes of interest, including depression (Halpern *et al*., 2014; Bryant *et al*., 2019; Wesemann *et al*., 2020), anxiety (Wesemann *et al*., 2020), negative cognitions (Bryant *et al*., 2019; van der Meer *et al*., 2020), alcohol use (Bryant *et al*., 2019), burnout (Halpern *et al*., 2014), and quality of life (Bryant *et al*., 2019; Wesemann *et al*., 2020). These mental health conditions were examined as either primary outcomes in addition to the PTSD symptoms (Halpern *et al*., 2014; Wesemann *et al*., 2020) or as secondary outcomes of interest (Bryant *et al*., 2019; van der Meer *et al*., 2020).

There was heterogeneity in the types of critical incidents reported by participants in these studies. Some studies focused on a specific critical incident or type of incident, such as motor vehicle accident (Warren, 1995), terror attack (Wesemann *et al*., 2020), civil disturbance (Wee *et al*., 1999), or air crash (Macnab *et al.,* 1999). The remaining studies did not specify the characteristics of the critical incident except that it led to the development of post-traumatic stress.

The included studies used different measures to assess post-traumatic stress, including the Impact of Event Scale-Revised (IES-Revised) used by Halpern *et al.* (2014), the Impact of Event Scale used by Macnab *et al.* (1999), the Los Angles Symptom Checklist used by Woods (2007),

the CISD questionnaire used by Warren (1995), the Frederick Reaction Index-Adult (FRI-A) used by Wee *et al*. (1999), the Clinician-Administered PTSD Scale (CAPS) used by Bryant *et al*. (2019), the Short PTSD Rating Interview (SPRINT) used by Jarero *et al.* (2013), and the PTSD checklist for the DSM-5 (PCL-5) used by Jarero *et al*. (2019), van der Meer *et al*. (2020), and Wesemann *et al.* (2020).

3.8.5 Summary of the reviewed interventions

Psychological debriefing

Of the 10 studies included in the review, five evaluated CISD (Warren, 1995; Macnab *et al*., 1999; Wee *et al*., 1999; Woods, 2007; Wesemann *et al.*, 2020). CISD is one of several crisis intervention methods that form part of CISM, a comprehensive programme aimed at managing reactions following critical incidents. This method was developed by Jeffrey Mitchell with the purpose of alleviating emotional sequelae following a traumatic incident, reinstate adaptive functions, and identify affected people who need additional mental health help (Mitchell, 1983). CISD is one of several components that comprise the CISM system, which can be implemented before (e.g. Pre-Crisis Preparation) and after (e.g. CISD and Crisis Management Briefing) a potentially disturbing event. CISD is used to encourage individuals to share their thoughts and feelings about a traumatic event with individuals who have been exposed to the same event within a small, homogenous group. CISD is ideally held within 24–72 hours after the traumatic event and is delivered by trained professionals (Mitchell and Everly, 2001).

Mitchell (1983) outlined the seven stages of CISD: 1) **Introduction phase**, in which information is provided about the process of the intervention, team members are introduced, and participants are encouraged to engage in the session; 2) **Fact phase**, in which participants are assisted in describing the critical incident from their point of view; 3) **Thought phase**, which allows participants to describe cognitive reactions (facts) and then shift them to emotional reactions; 4) **Reaction phase**, which focuses on detecting the most traumatic (worst) features of the traumatic event to identify emotional reactions; 5) **Symptom phase**, which involves recognising symptoms of post-traumatic stress in each participant and shifting these back to a cognitive level; 6) **Teaching phase** (psychoeducation), which educates participants with information regarding symptoms, constructive coping strategies, and stress management techniques; and 7) **Re-entry phase**, which involves summarising the key discussion points, answering questions and clarifying uncertainties (Mitchell, 1983).

CISD is considered a form of psychological debriefing (Everly *et al*., 2002). Generally,

psychological debriefing comprises a group of procedures that include speaking up (either individually or in a group discussion) about information relating to the traumatic incident coupled with other procedures, such as counselling, to prevent psychological distress and to assist with recovery following a critical incident (as a form of early intervention). CISD is usually offered to staff within the first few days of a critical incident (Mitchell, 1983).

Among the five included studies that evaluated CISD, only one reported a positive association between debriefing and the reduction of PTSD symptoms. This study, conducted by Wee *et al.* (1999), was a cross-sectional survey of two groups of EMTs who had experienced a critical incident. One group (n = 42) participated in CISD and the other (n = 23) did not. According to the authors, the PTSD symptoms of those who engaged in debriefing was significantly lower than those who were not debriefed (average FRI-A scores of 10.78 and 14.31, respectively; $P = 0.036$). This assessment was conducted three months after the 1992 Los Angeles uprising (revolution). The authors concluded that EMS staff who participated in CISD had lower post-traumatic stress reactions. Notably, the study depended on a self-administered questionnaire, and the sample size of the study was small. Another limitation was that the study did not use a pre-intervention assessment (baseline measure) to provide a reliable result and only compared scores between these two groups of EMTs.

The results of CISD evaluations were inconsistent across studies. More importantly, two studies reported a negative effect of debriefing on first responders who had experienced a traumatic event. Wesemann *et al*. (2020) reported a worsening of post-traumatic stress symptoms following CISD, with a higher rate of PTSD symptoms and negative cognition. The assessment was conducted four months after the participants had responded to a terror attack, and the results showed that first responders (EMTs, police officers, firefighters, and other non-governmental organisation employees) who had participated in CISD exhibited significantly more PTSD symptoms than those who did not participate ($t[39] = 2.32$, $P = 0.026$). The researchers concluded that CISD is associated with worse psychological health outcomes; they recommended the need for a modification of the CISD intervention to meet the needs of those who work in emergency services, specifically in relation to the component focusing on the emotions experienced by the affected individuals. This study was a pilot study and thus employed a small sample size (n = 55). Moreover, the researchers emphasised the need to tailor interventions to different genders, incident types, and job roles. With that being said, it is important to note that the findings were regarded as inconclusive, as per the authors' advice. This is because the study had a small sample size and lacked baseline measures. Therefore, according to the authors, rather than treat

this as evidence of harm resulting from an intervention, it is best to treat it as an indication of the possibility of harm and carry out more studies to ascertain or disprove this finding.

A similar pattern was identified by Woods (2007), who examined the effect of CISD on a group of paramedics and EMTs. Participants who had engaged in debriefing sessions reported higher PTSD scores (M = 17.4, SD = 1.3) than those who did not participate (M = 13.299, SD = 1.300). As suggested by the author, this could be due to three possible factors: first, the debriefing sessions may have revealed symptoms of existing PTSD that had not been resolved, resulting in an increase in symptoms; second, the CISD may have been ineffective and thus led to higher PTSD levels; or third, participants involved in the debriefing were exposed to severe trauma and thus experienced more severe PTSD symptoms that were difficult to manage. Beyond this, the study used a cross-sectional survey, which made it difficult to establish causality.

Two studies (Warren, 1995; Macnab *et al*., 1999) reported that CISD did not have a significant effect on the level of post-traumatic stress as it did not lead to a significant decrease or increase in PTSD symptoms. According to Macnab *et al*. (1999), there is no tangible correlation between PTSD symptoms and the frequency of CISD. Warren (1995) examined the effect of debriefing on EMTs and paramedics who responded to a serious motor vehicle accident. This study included an active group (Group 1) with only nine participants comprising those who had both dealt with the incident and participated in CISD. Group 2 contained 14 participants, all of whom had dealt with the incident but did not participate in CISD. Group 3 contained 57 participants who had neither dealt with the incident nor attended the CISD session. The author claimed that CISD had no effect on PTSD levels among those who had participated and those who had not participated ($P > 0.05$). However, the sample sizes of the comparison groups varied considerably, which made it difficult to compare these three groups.

Trauma-focused cognitive behavioural therapy

An RCT by Bryant *et al.* (2019) evaluated trauma-focused cognitive behavioural therapy (TF-CBT). The study recruited 100 first responders (paramedics, police officers, and firefighters) who were divided between CBT-L, CBT-B, and waitlist (control group). All participants had been diagnosed with PTSD according to the DSM-IV criteria (Fourth Edition). CBT is a type of psychotherapy with principles based on the cognitive model of mental illness (Beck, 1964). The model assumes that the way a person feels and behaves is influenced by the way that they perceive and interpret a situation. In CBT, therapists help patients understand the way they think and behave and provide them with techniques to modify any destructive cognitions and

behaviours (Fenn and Byrne, 2013). In the study by Bryant *et al.* (2019), TF-CBT took the form of 12 weekly individual sessions.

This sequence included a psychoeducation session, four sessions of therapy-related skills training, six sessions of *in vivo* (facing a feared object or setting) and imaginable exposure (imagining feared circumstances and images), and one session that focused on preventing the individual from regressing to mental deterioration. Two forms of TF-CBT were applied in the study: CBT-Long (CBT-L) sessions had a duration of 90 minutes, including 40 minutes of imaginal exposure, and CBT-Brief (CBT-B) sessions had duration of 60 minutes, including 10 minutes of imaginal exposure. All sessions were delivered by professional psychologists.

In their RCT, Bryant *et al*. (2019) found that CBT (both types, CBT-L and CBT-B) was effective in reducing symptoms of PTSD among the study's participants; PTSD severity, as measured by CAPS score, was reduced ($F[63.06] = 176.03$, $P < 0.001$). The study subjects participated in 12 sessions of CBT on a weekly basis.

Moreover, the results of the study suggested that CBT improved the quality of life and cognition in the active group. The research methodology was sound, with assessments performed at baseline, three months post-treatment, and at a six-month follow-up. Both long and brief CBT therapies significantly reduced PTSD symptoms compared with the waitlist group (considered the control group), with an effect size of 1.7 (1.0–2.3) for CBT-L and 1.6 (0.9–2.3) for CBT-B from baseline to post-intervention. Although the study maintained the control group for three months, the participants were randomised in the active group for ethical purposes following the waitlist period. Of note, the study did not report a significant difference between the CBT-L and CBT-B groups ($F[49.00] = 0.20$, $P < 0.85$), indicating that 60-minute CBT sessions were as effective as 90-minute CBT sessions.

Eye movement desensitization and reprocessing therapy

Two RCTs evaluated the effectiveness of Eye Movement Desensitisation and Reprocessing (EMDR) therapy on post-traumatic stress (Jarero *et al*., 2013; 2019). EMDR is a type of psychotherapy based on the adaptive information processing model (Shapiro, 2001; 2018). This model implies that negative emotional reactions (e.g., anxiety and disturbing thoughts) and behaviours are induced by dysfunctional information (distressing memories) stored in the brain; these negative memories were initially not processed efficiently and were thus maladaptively saved in the brain, leading to psychopathology when triggered by an internal or external stimulus. The core of EMDR therapy is to allow patients to focus on their disturbing memories while

engaging in bilateral stimulation (e.g., eye movements and butterfly hugs) to diminish the power of the feelings associated with these memories (Shapiro and Laliotis, 2011).

EMDR involves eight phases: 1) **Client History**, which focuses on obtaining the patient's history, performing a proper assessment, and working with the patient to recognise processing targets; 2) **Preparation**, which involves explaining the treatment and providing information about the procedures and components of the therapy and useful resources that foster the patient's sense of self-control; 3) **Assessment**, in which the therapist activates the targeted memory by assessing key aspects of the memory (e.g. negative and positive cognitions); 4) **Desensitisation**, which involves focusing on the memory while experiencing specific eye movements instructed by the therapist, reporting any new thoughts that emerge from the patient (formulating an adaptive resolution), and continuing until the patient does not report any upsetting memories; 5) **Installation**, in which the therapist works on strengthening connections to constructive cognition; 6) **Body Scan**, which monitors the patient's physical response while thinking about the traumatic event in conjunction with constructive cognition and processing any remaining physical sensations; 7) **Closure**, in which the therapist provides further self-control techniques to be used until the following session (in cases where the patient's targeted memory was not fully processed) to ensure stability at the end of therapy and between sessions; and 8) **Re-evaluation**, in which a therapist evaluates the effect of the therapy, the current mental state of the patient, and sets targets for the following session (Shapiro and Laliotis, 2011).

Jarero *et al*. (2013) examined the effect of EMDR on a group of 39 first responders (15 paramedics, 15 dispatchers and nine firefighters). The average SPRINT score for all participants was > 14 (moderate PTSD symptoms). The EMDR intervention was delivered and provided to first responders by paraprofessionals and hence was called EMDR-PROPARA. This technique was used because there is a lack of mental health resources (specifically a lack of mental health specialists) in developing countries, and people often struggle with poor mental health. Therefore, as claimed by the authors, there is a need for an intervention that can be provided by non-mental health specialists, such as paraprofessionals. A special teaching program was established in which the chosen paraprofessionals were trained and monitored by the first author.

The program aimed at minimising the severity of acute PTSD symptoms (symptoms that occurred within 3 months of an incident). The participants were randomly divided into two groups: the EMDR-PROPARA intervention group and a supportive counselling comparison group. Both groups exhibited moderate symptoms of PTSD at baseline (pre-treatment). Each group received two 90-minute sessions of either supportive counselling or EMDR. EMDR-PROPARA sessions

were delivered individually and followed the standard procedures of EMDR therapy. Symptoms were measured at four different times: pre-treatment (Time 1), post-treatment (Time 2), at one-month follow-up (Time 3), and at three-month follow-up (Time 4). The findings indicated that EMDR-PROPARA was effective in reducing symptoms of acute PTSD.

There was a significant decrease in scores from Time 1 to Time 4 in the intervention group; the mean score dropped from 17.26 at Time 1 to 2.36 at Time 4. Moreover, there was a significant difference between the supportive counselling group and the intervention group ($F[1, 35] = 92.29$, $P = 0.001$) represented by a continuous decline in the mean score of the EMDR group over time. The authors concluded that EMDR-PROPARA is an effective early treatment that can be used by paraprofessionals to mitigate the symptoms of PTSD among first responders in the early stages after a critical incident. Although the findings suggested that the intervention showed immediate results after three months (significant improvement at the second follow-up), It is unclear whether the effect of EMDR-PROPARA is similar to the EMDR delivered by therapists. The authors claimed that this intervention provides a fast brief therapy with an aim of minimising acute symptoms, to prevent the development of chronic PTSD symptoms which requires advanced treatments.

Another study, conducted by Jarero *et al.* (2019), investigated the effectiveness of the EMDR Protocol for Recent Critical Incidents and ongoing traumatic stress (EMDR-PRECI) on the level of PTSD symptoms, anxiety, and depression in a sample of 60 first responders. The study recruited 17 paramedics, seven emergency nurses, and 36 firefighters. The study only included participants with PCL-5 score of 30 or above. The average PCL-5 score for all participants was between 38 and 40.

The purpose of the EMDR-PRECI intervention was to manage the acute and ongoing post-traumatic stress specifically experienced by those who deal with a traumatic incident daily as part of their occupational role, such as first responders. It was designed to treat both acute symptoms of PTSD (those that developed in the hours after the critical incident) and persistent symptoms (those lasting for months). EMDR-PRECI broadly follows the standard procedures of EMDR therapy, although there are some minor changes, such as not focusing on positive cognitions in the assessment phase. The main difference between EMDR-PRECI and EMDR-PROPARA was that the EMDR-PRECI included intensive sessions which were delivered by certified EMDR specialists (as mentioned previously, EMDR-PROPARA was delivered by trained paraprofessionals).

Participants were randomly divided into two groups: the intervention group (EMDR-PRECI group) and a control group that did not receive any intervention. Symptoms of PTSD were measured pre-intervention, post-intervention, and at a follow-up 90 days after the end of therapy. It is also essential to note that the intervention group received a session of psychoeducation about post-traumatic stress, coping mechanisms, and EMDR treatment prior to completing the first (baseline) measure. The sessions were delivered by trained EMDR therapists, with each participant receiving two sessions of 60 minutes each in the morning and afternoon of one day. To be included in the study, participants needed to have a score of 30 or higher on the PCL-5 scale (DSM-5). All participants reported more than one critical incident during reprocessing. These incidents included cases of child or infant death, cases in which a patient was known to the first responder (relative, friend, or co-worker), gruesome injuries, death cases, incidents in which the first responder was in a dangerous or hazardous situation, and incidents that reminded the rescuer of someone to whom they were connected or related (e.g., an EMS worker who was also a parent attending a child death case). The study revealed that EMDR-PRECI was effective in reducing the symptoms of PTSD among first responders.

In the EMDR group, the mean PCL-5 score declined significantly between Time 1 (pre-treatment) and Time 2 (post-treatment) (t[29] = 22.91, P < 0.01, d = 4.01). Moreover, there was a considerable difference between Time 1 (pre-treatment) and Time 3 (follow-up) measurements in the EMDR group; showing a significant effect size on the PCL-5 (d = 3.99) (in comparison with an effect size of d = 0.56 in the control group).

Self-help interventions

In the study by van der Meer *et al*. (2020), the effectiveness of a self-help app called 'the SUPPORT Coach' on reducing PTSD symptoms was evaluated. The study was carried out on healthcare professionals (including EMS workers) who had a history of PTSD indicated by the presence of symptoms of PTSD (one or more symptom) within the past one month before the study. The study involved assessing the efficacy of a technology-based intervention.

This intervention is a self-help mobile app designed to aid individuals in identifying their post-traumatic stress reactions and managing their post-traumatic stress symptoms, to prevent the risk of PTSD. The app contains five sections: Section 1 is the '**information**' section and provides psychoeducational information related to trauma, post-traumatic stress, and mental health assistance; Section 2, the '**finding support'** section, involves contact information for professional help and support to help users' access professional care; Section 3, the '**self-test'** section,

includes the PTSD checklist (PCL-5) to help the user measure and monitor the severity of their symptoms; Section 4, the '**calendar**' section, contains a calendar that helps users schedule self-tests and other useful activities and training; and Section 5, the '**manage symptoms'** section, assists users in managing their symptoms through the provision of different CBT exercises, such as altering negative cognitions and muscle relaxation (van der Meer *et al.*, 2020).

In this study, Van der Meer *et al.* (2020) conducted an RCT in 287 healthcare workers (nurses, paramedics, ambulance drivers, and physicians) who scored ≥1 in the PC-PTSD-5. These participants were randomised into two groups: 143 intervention and 144 control group. the intervention group was provided with continuous access to the mobile self-help app and was instructed to use it whenever they felt it was necessary. The mobile app was developed as an intervention to help healthcare staff manage their PTSD symptoms following a critical incident. The results did not indicate any significant improvement in post-traumatic symptoms in the sample group that used the app.

There was no significant difference in the level of symptoms between the control and intervention groups in the period before using the app (pre-intervention) and at one-month follow-up. The findings indicated that the difference in PCL-5 scores from baseline to one-month follow-up in the intervention group was -4.66, while the difference in PCL-5 scores from baseline to one-month follow-up in the control group was -4.32. This could be due to a failure to monitor application use, as no indication of this was provided in the study protocol, according to the authors.

Downtime strategy

One study reviewed the effectiveness of the downtime strategy as an intervention to reduce or prevent long-term post-traumatic stress symptoms (Halpern *et al*., 2014). This strategy is based on providing a period out of service for EMS workers who have dealt with a traumatic event. This time out of service is offered by supervisors when an EMS worker reports having encountered a critical case and is exhibiting symptoms of post-traumatic stress. This strategy does not require any external professionals or therapists, and it focuses only on the distressed staff who responded to a critical case. The purpose of downtime is to provide sufficient time (usually 30 minutes to one hour) to recover between incidents by encouraging the affected worker to rest and regain control before returning to duty (Halpern *et al*., 2014). The authors proposed a model of recovery stating that early treatment of hyperarousal prevents the development of long-term psychological symptoms (Halpern *et al*., 2009). This strategy includes a form of peer support, in which the EMS worker spends the downtime engaging with peers who have also experienced the traumatic event,

facilitating mutual social support. The authors also indicated that this social support includes talking about the event as a form of debriefing and about other topics unrelated to the incident topics as a form of distraction. In some cases, supervisors are also included in the discussion, which aids affected EMS workers in decompressing and expressing their emotions and thoughts (Halpern *et al*., 2009).

In this study, Halpern *et al.* (2014) conducted a cross-sectional survey examining the association between receiving downtime after experiencing a traumatic incident and long-term psychological consequences. The study sample included 201 paramedics and EMTs (including supervisors) who had dealt with any incident that was distressing in the past. Among these participants, 52% described a call that was still distressing to them. The participants were asked how much time they needed to emotionally recover after dealing with a critical case and whether this technique was useful in managing their symptoms. This downtime was divided into four categories: 1) a period of less than 30 minutes after the incident, 2) a period of 30–120 minutes after the incident, 3) the remainder of the shift after the incident, or 4) a period of one or more days after the incident. Approximately 75% of the participants received downtime, with most of them (84%) indicating that they spent it with colleagues.

The study's findings showed that receiving downtime was positively associated with reduced depressive symptoms. However, it had no significant effect on the reduction of PTSD symptoms. The authors concluded that the symptoms of post-traumatic stress were not significantly correlated with receiving downtime (any downtime: 0.71 ± 0.59; no downtime: 0.78 ± 0.61; P = 0.48) (in terms of severity of symptoms). The cross-sectional nature of the study was a major limitation, because the point of time at which the outcomes were measured was not mentioned.

Of note, none of the studies aimed to prevent the occurrence of post-traumatic stress symptoms (though some studies stated treating post-traumatic stress symptoms along with preventing the occurrence of PTSD (e.g., Halpern *et al*., 2014). Furthermore, the heterogeneity of the included studies, in terms of methodology, type of interventions, measurements and effects, made it difficult to conduct a meta-analysis.

3.9 Discussion

The purpose of this review was to synthesise the evidence related to worldwide interventions aimed at reducing or preventing post-traumatic stress among EMS personnel. None of the studies included in this review were conducted in Asia, and most were conducted in the Western world. Of all the included studies, only four were RCTs. The scarcity of research in this field is surprising

when compared with the high volume of research related to the treatment of PTSD for other high-risk occupations, such as police officers and military personnel. This study revealed that TF- CBT and EMDR were the most effective interventions for EMS personnel exposed to post-traumatic stress. However, the evidence for effectiveness was limited to those individuals who were experiencing PTSD (either partial or full). As none of the studies focused on ASD nor the prevention of post-traumatic stress (ASD or PTSD).

Debriefing was the main intervention used in one-half (n = 5) of the studies included in this review. However, none of these CISD studies had a randomised design (i.e., none of them were RCTs). The findings indicated conflicting evidence regarding the usefulness of CISD in reducing PTSD symptoms. Reduction in PTSD symptoms was reported in only one of the included studies (Wee *et al.*, 1999). This finding is in line with a previous study conducted by Magyar and Theophilos (2010) among emergency department clinicians, which found that the benefits of debriefing included an improvement in the workers' level of satisfaction and team morale and a decline in stress reactions in the short term.

Interestingly, an RCT demonstrated the effectiveness of debriefing in reducing symptoms of PTSD, anxiety, and depression among a group of soldiers after encountering critical incidents only when it was adjusted to fit the local cultural context by combining it with training to strengthen cohesion. This study established an intervention that fit the organisational context of military personnel, which incorporated cohesion training with CISD to allow individuals to experience the feeling of unity and to enhance the sense of social support among them (Wu *et al.*, 2012). According to the authors, having a sense of unity between employees in such an organisation plays a critical role in their mental well-being (Wu *et al*., 2012). The evidence reported by Wu *et al.* (2012) suggests that cohesion training improves the degree of social support by allowing the participants to experience team power and effectively connect with each other.

In contrast, the CISD protocol established in the reviewed studies did not address the aspects of teamwork, cohesion, or social support in the cultural context of hierarchal organisations. As previous research has demonstrated that psychological interventions should incorporate social and emotional support to minimise PTSD symptoms (Drewitz-Chesney, 2012; Wu *et al.,* 2012). Therefore, it can be argued that adaptive CISD protocols which promote the sense of unity and social support might lead to a reduction in the impact of traumatic events on EMS workers.

Two of the included studies reported that CISD had an insignificant effect on reducing PTSD symptoms (Warren, 1995; Macnab *et al.*, 1999). These findings are in line with a recent systematic

review in which no association was found between debriefing and the level of psychological symptoms in a mixed group of first responders (Winders *et al*., 2021). The study found no significant difference in PTSD symptoms between those who received debriefing and those who received no intervention (Winders *et al*., 2021). A review conducted by Elhart, Dotson and Smart (2019) indicated that some of the reasons for the ineffectiveness of psychological debriefing included a lack of training and education of the person facilitating the debriefing session, a lack of adherence to CISD standards and conducting only a single session (Elhart *et al*., 2019).

Nevertheless, according to Macnab *et al*. (1999), there is no correlation between the numbers of CISD sessions and the severity of PTSD symptoms. In their study, debriefing was conducted for individuals who had dealt with the crash of an air ambulance that resulted in the loss of colleagues. All those who attended the debriefing sessions were traumatised by this incident at the time of the debriefing. The authors noted that debriefing was conducted by the hospital stress management personnel, who were unfamiliar with the working conditions of the ambulance staff. This could have affected the level of confidence that the clients had in the personnel delivering the debriefing session (Macnab *et al*., 1999), and could be due to the lack of social support and cohesion, which is vital for this high-risk occupational group. This was affirmed by Lambert and Barley (2001), who outlined that the most important element regarding the effectiveness of interventions is the nature of the relationship rather than the approach used by the therapists.

In contrast, two studies reported that CISD is not only ineffective in treating post-traumatic stress but may actually lead to a worsening of symptoms (Woods, 2007; Wesemann *et al*., 2020). This finding is consistent with a review by Bledsoe (2003), who noted that CISD is associated with a risk of increasing symptoms of PTSD in a mixed group of first responders. Nevertheless, it can be argued that there is still an uncertainty regarding whether the effect of debriefing differed according to sample (in terms of worsening of PTSD symptoms). This is because studies on debriefings differed in their sample (some studies included EMS only while others included mixed sample of first responders which disaggregated in their results).

Although debriefing models have been widely used among clinicians working in emergency departments, evidence has emphasised that there is lack of conclusive data related to the effectiveness of this strategy, which has indicated the need for further detailed evaluation of the models of psychological debriefing in emergency care (Magyar and Theophilos, 2010). In addition, past research has indicated that the timing of delivery of trauma-related interventions is important. According to Campfield and Hills (2001), CISD must be conducted within 72 hours after the occurrence of the traumatic event. Other parameters that should be considered in the application

of CISD include the use of a small group (which was evident in the studies included in this review), and the group members must have similar exposure levels to those occurring during the critical incident (Magyar and Theophilos, 2010). The latter condition was not outlined in all the studies that were included in this review and could thus be considered reasons for the inconclusive results.

Moreover, previous research has implicitly outlined the negative consequences of CISD, manifesting as vicarious trauma (secondary trauma) (Regehr and Bober, 2005). This occurs because individuals who have experienced trauma are more likely to be psychologically vulnerable; therefore, it is difficult for them to derive the traumatic event's meaning, resulting in worsening of the symptoms of post-traumatic stress (Regehr and Bober, 2005).

The effectiveness of TF-CBT was evaluated in only one of the studies included in this review (Bryant *et al.*, 2019). In this RCT, both forms of CBT (CBT-L and CBT-B) were effective in reducing the symptoms of PTSD among first responders (Bryant *et al*., 2019). Further, findings revealed a non-significant difference in terms of effect between CBT-L and CBT-B, indicating non-inferiority between the two interventions. TF-CBT is considered the first line of treatment for PTSD (Paintain and Cassidy, 2018). Similar findings were reported in a single clinical case study that involved a one-on-one session of intensive TF-CBT with a firefighter-paramedic suffering from PTSD that developed after the death of an infant (Gramlich and Neer, 2018). In this single case study, substantial improvements in PTSD symptoms were observed following treatment (Gramlich and Neer, 2018).

CBT mainly focuses on the negative behaviours that a person develops following a traumatic event. The process of CBT, which can be tailored to the specific needs of the individual, targets the meaning that is attached to a traumatic event, which is believed to be responsible for the development of PTSD (Brown *et al*., 2018). Furthermore, research has shown that TF-CBT techniques are the most effective and commonly used treatment methods for individuals diagnosed with either ASD or PTSD (Cukor *et al*., 2009; Roberts *et al*., 2019). In the review conducted by Roberts *et al*. (2019), studies that examined CBT reported sufficient sample sizes, employed sound methodologies with good follow-up schedules, and led to a substantial decrease in the severity of PTSD symptoms. Moreover, Bryant *et al.* (2019) found that there was no difference in the efficacy of the long- and short-exposure CBT. This has implications for future practice, suggesting that short-exposure CBT for 60 minutes can assist in reducing the severity of PTSD symptoms. Therefore, instead of mandatory sessions of CISD, which can do more harm than good (especially if administered incorrectly), short-exposure CBT can be used in one-on-one sessions for EMS personnel in the event of a critical incident.

EMDR therapy was found to be effective in reducing the symptoms of PTSD in two RCTs included in this review (Jarero *et a*l., 2013; 2019). Both forms of EMDR (EMDR-PROPARA and EMDR-PRECI) were effective in reducing the severity of PTSD symptoms in first responders. EMDR-PROPARA was found to be an effective early treatment that can be used by paraprofessionals to mitigate the symptoms of PTSD in the early stages after a traumatic experience (Jarero *et al*., 2013). EMDR-PRECI, in addition to reducing the symptoms of PTSD among first responders, was effective for managing depression and anxiety. Moreover, it is worth noting that previous research also demonstrated the effectiveness of EMDR and TF- CBT in police officers and firefighters (Alden *et. al.,* 2021). Thus, it can be argued that the effectiveness of these interventions for EMS personnel is similar to other first responders.

Insignificant improvements in post-traumatic stress symptoms were observed with the SUPPORT Coach self-help app and with downtime strategy (Halpern *et al*., 2014; van der Meer *et al*., 2020). Nevertheless, Halpern *et al*. (2009) demonstrated the benefit of having time to recover after a traumatic event by allowing individuals to explore and identify their own feelings and thoughts about that event. In their study, the authors examined the effect of identifying, describing, and venting feelings to cope with the effect of critical incidents on the mental well-being of a group of paramedics. An interesting finding that was highlighted by Halpern *et al*. (2009) was that, although expressing emotions had no effect on the level of PTSD symptoms, identifying emotions was correlated with a reduction in the symptoms.

However, the included study in the review by Halpern *et al.* (2014) did not find a notable correlation between receiving downtime and the symptoms of PTSD. The reason behind this finding could be that the effectiveness of downtime depends on how an individual uses this resource; some individuals might use avoidance strategies during downtime to cope with the trauma, while others may use downtime to process their traumatic reactions, according to the authors. The authors argued that the best duration of downtime is less than 1 day, which helps individuals to process instead of avoiding their feelings and thoughts (Halpern *et al*., 2014). This research also revealed the importance of educating EMS personnel about how they can identify their emotions following dealing with a critical incident to reduce their risk of developing post-traumatic stress reactions.

Because the reviewed studies required the participants to recall the critical incident, some bias could have resulted in the feelings and memories that were related to that traumatic event. Notably, first responders encounter and deal with traumatic events as part of their occupation, which exposes them to the risks of cumulative trauma. Cumulative trauma occurs due to frequent traumatisation, and it should be considered as one of the challenges in evaluating the

effectiveness of an intervention on emergency first responders (Marmar *et al.*, 2006). This could bring into question the reliability of the studies that were based on a single traumatic experience. Moreover, many of the included studies in the review were cross-sectional and focused on relationship rather than on causality. The low response rate that was observed in the survey-based studies was not surprising; it could have resulted from privacy and confidentiality concerns, especially in measuring the symptoms of post-traumatic stress in EMS organisations. Beyond this, bias could have arisen in the self-reported surveys when severely distressed individuals avoided participating in these studies to avoid thinking about the traumatic incident. Moreover, this review did not include unpublished articles, which might have introduced publication bias; this is because I wanted to maximise the quality of the studies included in the review.

Several important observations were noted while investigating the selected studies. For example, it is not advisable to generalise the degree of post-traumatic stress, as workers' perceptions of the critical incident along with the level and severity of their symptoms can vary. Moreover, men and women seem to handle post-traumatic stress differently, as was evidenced in the study conducted by Woods (2007), which revealed that female ambulance workers reported more PTSD symptoms than their male colleagues. The study reported that gender had an effect on the extent of PTSD symptom reporting. Thus, it may be useful to focus on making therapy sessions more individualised and educating therapists regarding this phenomenon. As noted in the narrative literature review (chapter 2), several pre-existing elements affect how an individual reacts to trauma, including the individual's coping strategies, personality, and cultural factors. Therefore, EMS organisations should take these factors into account when tailoring and implementing interventions for their EMS staff.

3.10 Conclusion

This review began with the aim of identifying which interventions would be effective for the treatment or prevention of PTSD and/or ASD among EMS personnel. Using an extensive literature search strategy, a total of 10 studies met the inclusion criteria for the review. Several interventions were applied in these selected studies; CISD was the most applied intervention.

Studies related to CISD were non-randomised and provided the most inconsistent results, which was in line with previous evidence, with some EMS personnel reporting a worsening of symptoms. The risk of applying CISD is that if a strict protocol is not followed, the intervention may cause more harm than benefit. In contrast, CBT and EMDR provided the most consistent results; even a 60-minute session of TF-CBT was shown to produce comparable benefits. This revealed the

potential of using short CBT sessions to treat post-traumatic stress. Furthermore, CBT generated overall positive psychological health outcomes for individuals.

None of the studies in the review focused on ASD; therefore, more studies are needed in this area. The review revealed a gap in literature regarding whether trauma-focused interventions that are effective in reducing PTSD symptoms can also be effective in preventing or treating ASD. Past research has shown that early treatment of ASD is likely to reduce the risk of developing PTSD (Cahill and Pontoski, 2005); therefore, there is a need for such studies, as it might help in preventing the occurrence of PTSD in individuals. Despite the difference between ASD and PTSD, the terms have been used interchangeably in the literature, making it difficult to recognise the type of symptoms that are being treated.

Moreover, although this review revealed that CBT and EMDR were the most effective interventions in treating PTSD, it is unclear whether the results of these studies can be generalised to other EMS personnel with different cultural backgrounds and contexts. Cultural context is an essential component of effective PTSD treatment (Bryant-Davis, 2019). Additional studies with randomised designs are needed to estimate the effectiveness of the different psychological interventions in addition to long-term follow-up.

CHAPTER 4: THEORY OF CHANGE

4.1 Introduction

The current chapter focuses on discussing Theory of change (ToC; Weiss, 1995) and its applicability in complex mental health interventions. ToC approach is widely used in various health interventions for developing a model that can improve the health-related outcomes. The chapter describes and discusses the ways in which TOC has been used to support development of psychological interventions are outlined, including through generating detailed and structured models. Furthermore, this chapter will discuss additional frameworks for the application of complex interventions (the MRC framework) and for adapting interventions to new contexts (the ADAPT-ITT framework). Later, this chapter outlines the rationale for choosing a modified approach of the ToC and details the various techniques involved in creating a ToC. Finally, a step-by-step process is provided for the holistic ToC framework adopted in the present study.

4.2 The MRC framework for complex interventions

Most mental health interventions are complex, with numerous elements combining and being administered at various levels (Caldwell and Welton, 2016). If such interventions are to be duplicated elsewhere, they must be accompanied by well-documented procedures that outline the creation of the interventions' components (Schierhout *et al*., 2013).

In recent years, several different approaches to complex intervention development and evaluation have emerged. One of the best-known approaches is the Medical Research Council (MRC) framework, which was first published in 2000 and later updated (Campbell *et al.*, 2000a; 2000b; Craig *et al.,* 2013; Skivington *et al*., 2021). The MRC framework has been widely applied for complex interventions in the healthcare field due to its pluralistic technique (Skivington *et al*., 2021). The MRC framework consists of four stages:

1- Development. This initial phase involves identifying a planned intervention or developing the intervention. This phase ensures that the appropriate theories for the intervention are utilized and allows for predicting and planning the various approaches that could be applied. At this stage, the components are designed based on understanding the relationships between the various parties involved in the intervention. The design can be drawn up based on qualitative interviews or the information gathered from the focus groups. Also, according to Skivington *et al*. (2021), research on complex interventions does not always require initiating a new intervention, as adapting interventions to new

contexts could be carried out after assessing which aspects of the intervention's components need to be modified.

2- Feasibility, or piloting. This stage involves assessing the viability of the intervention. Testing to identify the most suitable sample groups and sample sizes, along with estimating participants' response rates and level of acceptance towards the intervention, takes place at this stage. This also involves making a decision regarding the readiness to head to the next stage, which is the evaluation.

3- Evaluation. This is where the effectiveness of the intervention is assessed. The evaluation involves assessing the most suitable way to address the research questions and identifying processes of change to understand how the intervention might work.

4- Implementation. The final stage involves implementing the results of the successfully tested intervention and working towards a successful outcome for the intervention. It also includes disseminating the findings and monitoring clinical outcomes.

While the MRC framework is designed to develop and evaluate complex interventions, the focus of this study is on a set of complex interventions. Hence, more benefits can be obtained from the use of the ToC approach rather than the MRC framework. As the key advantages of using a modified ToC approach are the emphasis on theories about underlying mechanisms and the easier links to logic model development.

4.3 The ADAPT-ITT framework

Several approaches have been applied this far to adapt interventions to new contexts. While it is ideal to use interventions that have been developed and evaluated with the demographic being treated in mind, where no such intervention exists, a modification may be the most feasible and cost-effective way to systematically merge the intervention with the individual's cultural background and context (Chowdhary *et al.,* 2014). Clinical research outcomes could improve as a consequence of adapting interventions while maintaining their original effectiveness (Castro, Barrera, and Holleran Steiker, 2010). Research has shown that when patient participation or results are less than what might be anticipated based on existing data, culturally acceptable treatments may be warranted to increase both participation and outcomes (Chowdhary *et al.,* 2014).

There are several models and conceptualisations that can enable the adaptation of interventions to a particular context, such as the ADAPT-ITT model (Wingood and DiClemente, 2008). The

ADAPT-ITT is a paradigm for adapting pre-existing evidence-based treatments in a systematic manner to increase their efficiency in new settings (Wingood and DiClemente 2008; Wingood *et al.,* 2011a; 2011b). Wingood and DiClemente created the ADAPT-ITT framework, taking into account requirements for cost-effectiveness and adherence to fundamental interference factors, as well as the need to produce a modified intervention that is appropriate and viable for the target group (Wilson *et al.,* 2022). The ADAPT-ITT methodology is comprised of eight consecutive steps that give practitioners and experts a way to modify existing interventions. They are:

Phase 1: Assessment

The initial phase involves collecting data from a variety of resources to gather information about the issue and to identify the target population, along with emphasising the need for an intervention. The key question to be answered in this stage is who the target population is.

Phase 2: Decision

Following assessment, the team should determine the intervention(s) to be implemented for the target population. In this step, a decision should be made regarding whether to adopt or adapt the selected intervention(s).

Phase 3: Adaptation

An initial draft of the intervention is developed in this phase. This will include reference to a pretested methodology which will aid in understanding how the intervention should be adapted.

Phase 4: Production

This is where the team create an adaptation plan and determine the goals to be achieved from the adaptation of the intervention.

Phase 5: Topical Experts

This phase will include the identification of topical experts such as the intervention developers and individuals with specific expertise in the topics involved in the intervention and who are able to provide substantive contributions and technical assistance.

Phase 6: Feedback Integration

In this phase the topical experts evaluate the accuracy of the contents of the intervention, and the overall benefits that could potentially be gained using the intervention. Also in this phase, a new draft of the adapted intervention is created which integrates feedback from the experts.

Phase 7: Training

Training all relevant personnel who are involved in the intervention, such as those who will deliver the intervention and those who are responsible for managing and monitoring the data, are trained in this phase.

Phase 8: Testing

The final phase includes carrying out a pilot test to evaluate the efficacy of the adapted intervention in terms of outcomes. Feedback is also obtained from the target group and stakeholders regarding the acceptability, suitability, and usefulness of the adapted intervention, which all help to prepare for conducting a trial.

Although the ADAPT-ITT framework could be applicable to complex interventions, it might be that it is better suited to simpler interventions.

4.4 Theory of change in psychological interventions

Due to its theory-driven approach to assessment, the theory of change (ToC; Weiss, 1995) approach has become increasingly popular as a tool for creating and assessing complex interventions in recent years (Breuer *et al*., 2014; De Silva *et al*., 2014). Some studies argue that a better understanding of the mental health interventions that underpin ToC might enhance the assessment of complex interventions (Breuer *et al*., 2018).

Theory-driven evaluation is based on “an explicit theory or model of how the program causes the intended or observed outcomes and an evaluation that is at least partly guided by this model’’ (Rogers *et al*., 2000, p. 5). There are a number of similar forms of theory-driven assessment methodologies, such as logical systems, outcomes, structures, realism evaluation, and the ToC (Coryn *et al*., 2010; Funnell and Rogers, 2011). Connell and Kubisch (1998) note that Weiss defines ToC as a methodical and quantifiable study of the links among operations, consequences, and situation, and that it offers an integrative framework for comprehending, methodically experimenting, and improving the supposed interconnection between an intervention and its expected outcomes. According to Maini *et al.* (2018), ToC is a technique to comprehend and describe how interventions might bring about long-term results via a coherent way of preliminary consequences and has been used to develop and assess the effect of interventions in a variety of situations. According to De Silva *et al*. (2014), ToC may be characterized by the application of evidence-based measurements and metrics to describe an initiative's direct route to effect.

For the purpose of this research, a modified ToC approach was developed in order to achieve the particular aims of the study. The rationale behind the use of the ToC framework is based on how

its components can assist in gaining an understanding of the different mechanisms of how change can occur without focusing on one specific type of intervention or strategy. In addition, because of the pragmatic approach of this research, a modified ToC approach is optimal for handling the multifaceted nature of post-traumatic stress, which requires the exploration of various elements that could result in positive outcomes with regard to the mental well-being of EMS personnel following experiences of traumatic incidents. The modifications to the ToC are discussed in the section below. Alongside the logic model, the ToC serves to explain not only the what, but also the why and how.

4.5 Process of creating a ToC

Although definitions of ToC differ, the present study characterizes it as a strategy that outlines how a program achieves certain long-term results via a consistent series of preliminary objectives (De Silva *et al*., 2014). Typically, the ToC employs a backward mapping technique that begins with the long-term objective and then charts the necessary change procedure and various outcomes needed to accomplish this and how those outcomes can be achieved over short term, medium term, and long term (Serrat and Serrat, 2017). Usually, the process of building a ToC commences early in a project, with key players asked to create a shared understanding of the temporal chain leading to the objective of the developed intervention. During this phase, precise objectives, metrics, assumptions, obstacles, and actions are determined in order to achieve the intended results (De Silva *et al*., 2014).

ToCs are created using a variety of techniques. The techniques varied from methodological techniques, such as seminars and work teams, which foster stakeholder engagement and responsibility of the ToC, to much more evaluator-focused techniques, like performance monitoring and examination of documents related to research and strategy (Funnell and Rogers, 2011; Breuer et al., 2016). Although the authors seldom provided specific justification for their technique selection, it is likely that these approaches were selected based on the ToC's needed purpose, depth, and amount of stakeholder buy-in (Aromatario *et al.*, 2019). Examples of the creation of programs of treatment for children and teenagers with mental and behavioural disorders, for instance, viewed stakeholder involvement as absolutely essential and, as a result, held a series of seminars with various stakeholders from various public sector divisions, service providers, family members, and care recipients (Hernandez and Hodges, 2006). There is evidence that the ToC method may be an effective tool for planning and assessing psychological interventions, including building assessment frameworks and gaining the requisite support from

key stakeholders (De Silva *et al*., 2014).

A modified ToC approach was applied for the purpose of this thesis; in other words, this approach was informed by ToC rather than following it to the letter. For instance, the process of creating the ToC was conducted after data collection, as part of the analysis phase. By assessing the findings of the qualitative interviews, I can subsequently determine the necessary actions to achieve the desired outcomes, along with the key factors contributing to the effectiveness of interventions. Another modification to the process was the absence of contributions from key players (stakeholders) throughout the creation of the ToC, as I —after conducting the interviews— developed the ToC with feedback received from my supervisors. The reason for these modifications is that the research participants were, in effect, stakeholders. So rather than consulting with them, I undertook rigorous and thorough research interviews. The ToC is therefore based on primary research evidence, which I then synthesised with the systematic review results (in chapter 3) to generate a logic model (presented in chapter 9). Moreover, it is worth mentioning that a logic model is a collection of hypotheses, which requires testing later. Hence, the ToC with the logic model could serve as a critical step in the development of a complex suite of organisational-level interventions, informed by the adaptation of evidence-based trauma-focused treatments.

A further strength of the ToC approach is its support for logic model development. In this study, the ToC directly informed the development of a logic model that may serve as a foundation for the EMS organisations in the UAE. The development of a logic model, which was one of the study's objectives, could help people within these organisations to identify the causal pathways by which change occurs (De Silva *et al*., 2014).

The development of a ToC involves several techniques. For instance, Hernandez and Hodges (2006) outline the 12-step procedure for developing a ToC for delivery of mental health services to children with severe emotional problems and their families. Each phase is described in length, including its goal, the sorts of stakeholders involved, the nature of the conversations, and the conclusions made. The Table of Contents was then presented as a logic model for readers to obtain a better grasp of the process's output (Hernandez and Hodges, 2006). Noble (2019) has presented a 10-step ToC shift, which focuses on presenting a comprehensive perspective that integrates many components, such as activities, mechanisms of change, results, and effect. In addition, Aromatario *et al.* (2019) developed a three-step ToC for developing an intervention for healthy eating utilizing smart devices and apps.

4.6 Steps to create a theory of change (ToC) in relation to this thesis

The theory of change underpinned the process of building the study's logic model. The ToC method was used to formulate a series of hypotheses about desired outcomes and to help with understanding the mechanisms of how interventions work. Using the ToC framework for the development and evaluation of potential changes (interventions) within the service entailed several phases. The 10-step holistic ToC model by Noble (2019) was selected for the present study. The steps are:

1. **Analyse the situation.** The first stage focuses on achieving a thorough grasp of the problem I want to address, the inputs they are introducing into the system and the optimal course of action. The emphasis is on identifying the individuals who are affected by the problem being analysed and its implications. This step also involves examining the problem's causes, the actions necessary to bring about a change, the obstacles to implementing change and any related factors. Concerning the present study, the problem under investigation is the impact of critical incidents on the mental well-being of EMS personnel in the UAE. As mentioned previously, due to the nature of their work, EMS personnel are exposed to critical incidents which increase their risk of post-traumatic stress. This problem's ubiquity has been established in the narrative literature review chapter (chapter 2). In addition, as noted in chapter 1, there presently is no research that has investigated the experiences and perspectives on this issue of EMS personnel in the UAE.
2. **Identify the targeted population.** This step focuses on outlining the sorts of persons or institutions with whom I intend to collaborate effectively, so as to bring about a collective change that will benefit both individuals and institutions. This also includes selecting the individuals whom the research primarily intends to aid or affect. In the present study, the target population consists of EMS professionals working in two main EMS organisations in the UAE. EMS workers were chosen due to the demands of their work, which expose them to traumatic experiences, thus putting them at risk of post-traumatic stress (including ASD and PTSD).
3. **Formulate a long-term goal.** This step determines the long-term impact on people, households, groups and the environment as a result of implementing the change (intervention). The effect may be seen in terms of the change's sustainability and should be meaningful and significant. The intervention must contribute to long-term results. This

study's intended effects may be considered as constituting a continual transformation. Its goal is to minimise the effects of traumatic situations on EMS workers by finding potential ways to tailor existing interventions to the local context of the UAE.

4. **Identify the outcomes.** This stage focuses on establishing the advantages to be gained by individuals or organizations upon implementation of the change (intervention). This entails determining the shorter-term improvements that the research intends to implement and which in turn contribute to the long-term goal. These may include modifications in the target population's behaviours, attitudes, levels of awareness and abilities. In the present study, qualitative interviews were conducted with frontline workers and their superiors to gain an overview of the types of outcomes needed in the workplace in order to be able to achieve the purpose of the study. In addition, interviewing this sample aided in the exploration of strategies with the potential to make interventions acceptable in the context of EMS organizations in the UAE (step 4 – 10 are discussed in detail in chapter 9).
5. **Identify required actions.** This phase focuses what should be done, or what is scheduled to be done and what type of activities will boost the outcomes. Researchers must plan the activities (actions) to be carried out and the manner in which they will be executed.
6. **Outline change mechanisms.** This step consists in describing how I would want individuals to participate in or experience the change that leads to the desired outcomes. This step is primarily about coming to a full understanding of the ways in which the intended actions lead to the desired outcomes and long-term goal. This might be expressed by describing the sort of thought or emotion that the research is intended to facilitate in its target population (Noble, 2019).
7. **Describe sequences.** This stage focuses on exhibiting precise and comprehensive thought on how change will occur (and, if applicable, in what stages) leading to the final impact. It is essential to search for logical flaws and investigate whether certain actions might be more appropriate at various stages than those already planned (Noble, 2019). For ambitious or lengthy endeavours, considering the project's sequence aids in establishing intermediate goals and early success indicators.
8. **Create a logic model.** This step involves creating a diagram that explains the ToC model under development. The major conclusions are summarized in a logic model, and an explanation is provided of how the model's components are interconnected.

9. **Address stakeholders and the facilitating factors.** This step entails identifying the external elements that might influence the actions and objectives of the research. This step entails considering the obstacles and facilitators to applying the ToC; these are investigated in the qualitative phase of the present study.
10. **Generate assumptions.** The final step includes formulating assumptions. This step focuses on identifying areas where the ToC is weak or ambiguous; these areas require further investigation and testing (Noble, 2019). Such assumptions carry some uncertainty; thus, they require further evidence to render them plausible. In this study, the assumptions will be outlined in chapter 9. However, testing these assumptions is outside of the current study's scope.

4.7 Chapter summary

The chapter discussed the ToC, which can be selected as a method of developing and evaluating a complex intervention. A modified ToC approach is applied in the present study to enhance the understanding of how changes can be made to the organisation to minimise the impact of traumatic experiences on EMS personnel and determine how interventions can be tailored to the context of EMS organisations in the UAE. The approach could aid in outlining the mechanisms of change that are likely to lead to the desired outcomes and the study's main objective.

CHAPTER 5: RESEARCH METHODOLOGY AND STUDY DESIGN

5.1 Introduction

This chapter discusses the research methodology, along with the study design undertaken to address the research question. The chapter presents information about the qualitative research approach and provides a rationale for using it in this study. It then describes the different research paradigms and demonstrates the rationale for choosing pragmatism. The various types of qualitative research designs are then explored, along with the different data collection methods used in qualitative research. Finally, the chapter outlines the main strengths and weaknesses of qualitative interviews.

5.2 Approach: Qualitative research

For study aims to be accomplished, the researcher needs to select the most suitable design. The term 'research design' has been defined as a plan adopted by the scholar to research objectively and valid (Asenahabi, 2019, p. 76). The design is selected before the data collection commences because different designs may use different data collection methods (Asenahabi, 2019). “The essence of a research design” is that it helps the researcher “translate a research problem into data” that can be analysed to answer the research questions in a way that is considered cost effective (Asenahabi, 2019, p. 78). The design connects the conceptual research problem to the empirical research (Creswell, 2014; Asenahabi, 2019). Therefore, the purpose of the research dictates what design can be used.

Researchers can choose different research designs, namely qualitative, quantitative, and mixed-methods research. A quantitative research design is most appropriate when factual data is needed to answer the research question (Creswell, 2009; 2014). In addition, a quantitative research design is utilised when general or probability data is required on opinions, views, beliefs, and preferences while quantitative methods may reveal the percentage of people who support certain controversial ideologies. On the other hand, mixed methods research is a method that implies gathering quantitative and qualitative data and then combine the findings using different designs (Creswell, 2009; 2014). Qualitative data is open-ended without any predetermined answers, while quantitative data is close-ended with possible predetermined answers. Mixed methods research is most appropriate when neither quantitative nor qualitative research can offer the best understanding of the issue under research (Creswell, 2014). The current study aimed not to understand frequencies or derive factual information from collected data. Therefore, using

quantitative or mixed research methods was not appropriate. Qualitative data offers insights into respondents' perceptions and attitudes towards issues; these data will help identify ways to tailor existing interventions, thus achieving the main aim of the study.

5.3 Research Paradigm

Studies in social research require scholars to outline the paradigm used in conducting the research. Kaushik and Walsh (2019, p. 1) define the term 'paradigm' as the philosophical assumptions or set of beliefs that guide the actions and outline the researchers' worldview. Kivunja and Kuyini (2017, p 26), explains that paradigm is derived from a Greek word meaning 'pattern' and is often used by academics to imply how researchers see the world and frame research topics. A research paradigm influences scholars to approach a topic from the perspectives and beliefs that guide their actions (Kivunja and Kuyini, 2017). The two philisophical viewpoints, Epistomolgy and Ontolgy are dicussed in the following section.

5.3.1 Epistemology

Epistemology denotes the theory of knowledge and how it is collected (Kivunja and Kuyini, 2017). Epistemology explains “how we come to know something; how we know the truth or reality” (Kivunja and Kuyini, 2017, p.27). It deals with the nature of knowledge and methods used to acquire it and how it is communicated to others. In Epistemology, a researcher must question whether knowledge can be acquired (learned) or something that can be personally experienced (Kivunja and Kuyini, 2017).

5.3.2 Ontology

Ontology, on the other hand, is concerned with the suppositions people make “to believe that something makes sense or real” in the phenomenon being studied (Kivunja and Kuyini, 2017, p.27). Ontology enables the researchers to understand the nature of reality and what they “believes can be known about that reality” (Kivunja and Kuyini, 2017, p.27). Ontology offers researchers an understanding of the elements that shape the world as it is known (Kivunja and Kuyini, 2017).

5.3.3 Pragmatism

The researchers have proposed different paradigms. One of these paradigms is positivism, which is considered as the scientific approach to searching for evidence (Kivunja and Kuyini, 2017). This approach is mainly used to examine cause-and-effect relationships; it relies on an objective search for truths (Kivunja and Kuyini, 2017) as the researchers can distance themselves from

their findings. Another is the interpretivist/constructivist paradigm, which posits that knowledge is obtained from an interaction between the researchers and their studied population (Kivunja and Kuyini, 2017). In this approach, researchers seek to understand the experiences and perspectives of the subjects being studied, rather than focusing on the researchers' own perspectives. Moreover, this approach takes into account the contextual factors that may affect the issue being studied (Kivunja and Kuyini, 2017).

A researcher can select from several paradigms depending on the objective of the research. One such paradigm is pragmatism, described by Tashakkori and Teddlie (2003a; 2003b) as having its roots in the philosophy of pragmatism. This philosophy holds that researchers should adopt methodological approaches or philosophies that work best for the specific research problem (Tashakkori and Teddlie, 2003a; 2003b). In other words, pragmatism embraces what can be described as a plurality of methods, which means that scholars are not confined to a particular methodology. However, the basic idea is that the research problem dictates which methodologies to use as opposed to a researcher selecting methods and then trying to align the research problem to them (Tashakkori and Teddlie, 2003a; 2003b). It can therefore be argued that pragmatism is the best possible paradigm due to this form of freedom and the flexibility that means that any problem can be researched as long as there is a method that fits it. The idea of the practicality and plurality may also be used to suggest that if conditions dictate, a researcher can use more than one method (Tashakkori and Teddlie, 2003a; 2003b; Kivunja and Kuyini, 2017). Moreover, accoridng to Kaushik and Walsh (2019, p. 12), "a pragmatic approach allows the possibility of choosing the appropriate research methods from the wide range of qualitative and/or quantitative methods". Therefore, it can be said that this approach allows a researcher to emphasise the research problem and utilise every approach available to understand the problem.

Pragmatism does not fall under any system of philosophy or reality (Tashakkori and Teddlie, 2003a; 2003b ; Kaushik and Walsh 2019). A pragmatic approach is best suited to the complex topic of this research: understanding the perspectives of paramedics, supervisors and managers regarding tailoring existing potential interventions. It will help the researcher understand the subjective dimensions of the research participants and lead to the best method for achieving the study's purpose.

5.3.4 Inductive and deductive reasoning

In order to comprehend the various elements in philosophy, it is essential to understand how theories and conclusions are found with data. There are two types of reasoning used in research,

namely inductive and deductive (Trochim, 2006). In an inductive approach, the researcher moves from specific experiences to a more general set of propositions about these experiences. Once the data has been collected, the researcher analyses it to find patterns in the data and works towards theory development (Trochim, 2006). Whereas in a deductive approach, a researcher starts with a convincing social theory and tests its implication with collected data. Therefore, a researcher moves from a more general to a specific perspective in deductive reasoning (Trochim, 2006).

The below figure presents a research onion showing the techniques by which several research components could be assessed to form the study's design (Saunders, Lewis and Thornhill, 2009).

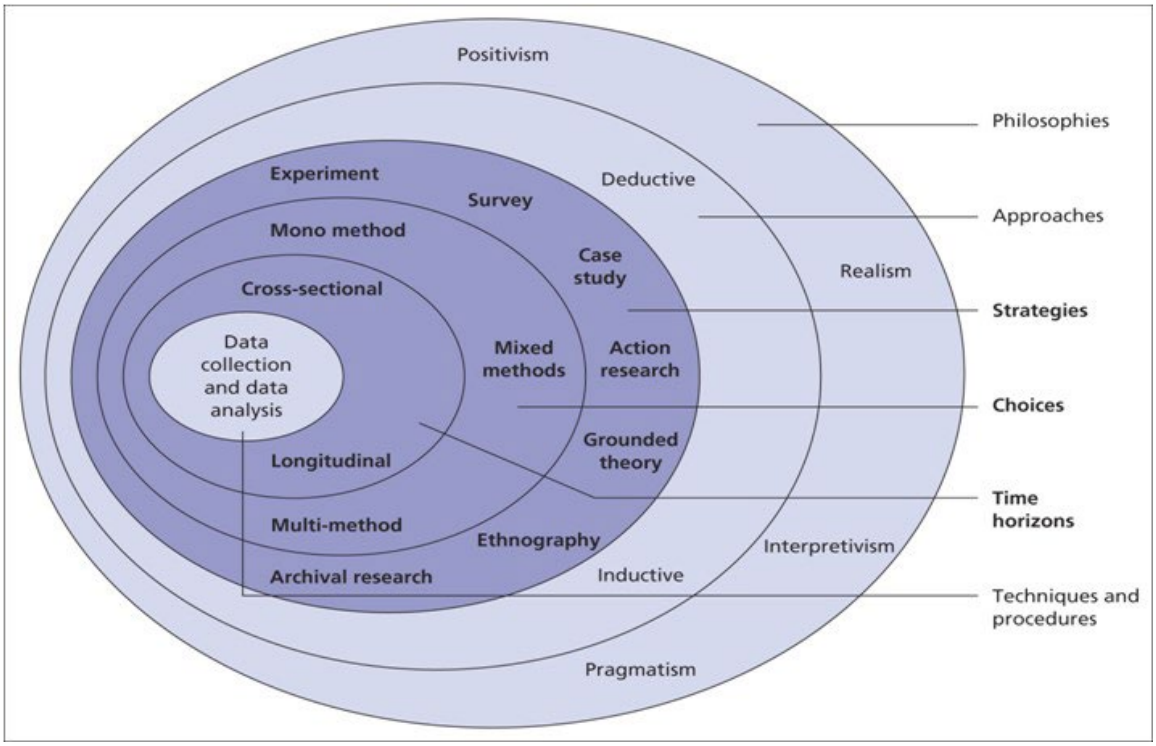


Figure 4: Research Onion (Saunders, Lewis and Thornhill, 2009).

5.4 Rationale for qualitative research

Qualitative research is often preferred over quantitative methods in certain conditions. Busetto, Wick and Gumbinger (2020), state that not all questions can be answered quantitatively, especially those where the data collected is written and/or verbal rather than numeric. If the research asks respondents what they feel or think about a situation, their responses cannot be expressed mathematically. However, quantitative methods may find a few applications in

qualitative research, especially simple statistics. For example, a scholar can decide to present descriptive statistics of the population demographics, including age, education levels and gender. A comparison of responses can also be presented quantitatively by illustrating how many participants held a particular belief.

According to Busetto, Wick and Gumbinger (2020), a qualitative approach is more appropriate for research problems involving the evaluation of complex multi-element interventions. According to Mohajan (2018), qualitative research can also be described as a form of social action that pays attention to the way people interpret and make sense of social reality and their experiences. As a result, qualitative research focuses more on people and their perceptions of the research problem. Moreover, Mohajan (2018) emphasises that qualitative research is more interested in people's beliefs, experiences, and systems of meaning, and it regards them from their perspective. No statistical analysis is needed since these aspects cannot be quantified.

Researchers have various methods at their disposal for conducting and assessing qualitative research, including reflexivity, sampling and piloting. Reflexivity encompasses the dynamics of the relationship between the interviewer and the interviewees, as well as the interviewer's background and subject matter expertise. These factors must be acknowledged by the interviewer, as they can influence how respondents answer the questions (Busetto, Wick and Gumbinger, 2020). Sampling is another key aspect of qualitative research. In this process, the researcher selects a sample that fully represents all variations pertinent to the study's subject. They also confirm the attainment of data saturation, a point where no additional data would provide new insights (Busetto, Wick and Gumbinger, 2020). Piloting serves as another method for assessing the quality of qualitative research. It involves testing the interview guide to determine whether modifications – such as adjusting the interview duration or question format – are necessary to improve the data collection and analysis process (Busetto, Wick and Gumbinger, 2020).

This research aims to identify potential ways in which we can tailor existing interventions in preventing or reducing post-traumatic stress among EMS personnel to make them fit the context of EMS organisations in the UAE. A qualitative approach will help understand the frontline staff's experiences regarding current interventions. It will explore their personal and cultural beliefs, their preferred coping strategies for dealing with post-traumatic stress, and the opinions of the organisation's top management team regarding worldwide existing interventions. Moreover, it will assist in exploring the perceived barriers to, and facilitators of, seeking mental health support

(whether formal or informal), along with constraints regarding the implementation of certain interventions. Qualitative research explores the quality of phenomena, their various manifestations and how can they be perceived (Busetto, Wick and Gumbinger, 2020). A simpler interpretation of this definition is that qualitative research assists in understanding the experiences of participants, their behaviours and their beliefs about certain phenomena; and focuses on the traits of a social problem as understood and experienced by these individuals.

Applying principles of pragmatism to this study begins by determining what the research seeks to achieve and how best it can be accomplished. Looking at the objectives, it becomes apparent that large amounts of data are needed to comprehensively answer the research question. Therefore, a method will be needed whereby such data can be gathered within a reasonable time, which explains why narrative and systematic literature reviews are conducted (Chapters 2 and 3). A literature review often seeks to gather what recent studies have done and explored other credible published data on the subject. However, there is also a need to understand the current trends in addressing the research problem, which means primary data is the best way to accomplish this goal. According to Creswell (2009), pragmatism helps researchers focus on the 'what' and 'how' of a research problem (Creswell, 2009; p. 11). In this case, using a pragmatic philosophical approach allowed me to use the best methods possible to identify factors to consider when tailoring post-traumatic stress interventions to enable their effective implementation in the UAE EMS context.

The current study utilised both inductive and deductive reasoning. Both inductive and deductive approaches were used during the data analysis stage. The study borrowed data from the literature review to form conclusions about the currents. New ideas also emerged from data collected during the interviews.

5.5 Types of qualitative research designs

The next section is an exploration of different qualitative research designs and suitability for the research being undertaken.

5.5.1 Ethnographic approach

Creswell (2014) defines ethnography as the process in which research participates, openly and secretly, in a community's everyday lives for a period of time, observing, listening, and asking questions while collecting relevant information. Ethnography research has its roots in cultural anthropology, where researchers immersed themselves in culture. A researcher gets to

experience the environment without relying on surveys or interviews. The main purpose of ethnographic research designs is to understand the culture and symbolic elements of people's actions and the situations under which those actions happen (Griffin and Bengry-Howell, 2017).

The main underpinning of ethnographic research is that the shared cultural meanings of a social group are essential in understanding any community's activities (Griffin and Bengry-Howell, 2017). Therefore, researchers participating in a community's daily activities can attune to the meaning of behaviours, actions, and contexts from the group's perspective. As Griffin and Bengry-Howell (2017) note, ethnographic research happens in its natural setting, not in a controlled setting. Ethnography can use different data collection methods, such as structured and semi-structured interviews, observations, diaries, video recordings, and official documents. The data collection periods are often prolonged because the researcher has to become familiar with the cultural setting under study. This approach would be time-consuming, especially considering that frontline staff works different shifts and in different ambulance stations. Therefore, the approach was not considered appropriate for this study. In addition, the approach does not appropriately answer the research questions because it is more concerned with understanding a shared group culture, whereas the frontline staff comes from diverse cultures and backgrounds.

5.5.2 Narrative Inquiry

The narrative inquiry approach interlaces an arrangement of events from one or two people to create a cohesive story (Creswell, 2014). Howitt (2019) reports that narrative psychology denotes the structure, content, and function of stories that people tell each other during social interactions. A narrative inquiry offers researchers an opportunity to explain human experiences. People use stories to disclose their true feelings, fulfil social demands, and sometimes challenge the status quo. One significant element of narrative inquiries is that narrators can actively construct their experiences personally depending on the discursive context and motivation (Hiles, Cˇermák, and Chrz, 2017). Individuals who have undergone some type of trauma offer examples of ways they use to understand the events through the creation of stories.

When re-telling a story, an opportunity to reframe the narrative often appears, allowing researchers to incorporate more authentic information into one story (Howitt, 2019). In addition, reframing allows exploring new points of interpretation and altering emphasis (Hiles, Cěrmák, and Chrz, 2017). Howitt (2019) further notes that narratives are constructed depending on the narrator, the audience, and the social context. Data can be collected using different means such as interview transcripts, observations, pictures, and personal philosophies (Howitt, 2019).

While narrative inquiry in psychology can reveal issues not recorded elsewhere, narrators can modify their stories because they know they are being studied, which affects the reliability of research findings (Howitt, 2019). In addition, it is impossible to generalise the results from a narrative inquiry because they are based on the experiences of one individual. Subjects will focus on their lived experiences rather than any other social movements. While this research method would be appropriate for understanding the experiences of individuals, the main purposes of this study is to understand participants' perspectives and experiences regarding current interventions and to seek their opinions on how to make interventions effective. Thus, this approach would only be suitable if the purpose of the study was to understand individuals' lived experiences with traumatic events – which is not the case.

5.5.3 Phenomenological approach

Phenomenological research scrutinises human practices through the accounts offered by the people involved (Creswell, 2014). The main purpose of a phenomenological study is to define the meaning of the experiences of every participant. Howitt (2019) reported that phenomenological psychology gets descriptions from participants about their lived experiences. Through these descriptions, the researcher tries to comprehend the nature of the subject matter. For this type of research, researchers must be aware of their own beliefs, biases, and assumptions because they may make it difficult to understand others' experiences (Creswell, 2009; Howitt, 2019). Participants' experiences must be described solely by the experiencer, which permits the researcher to conduct the first personal analysis. This approach is also best suited to a study which aims to examine participants' lived experiences of traumatic events.

5.5.4 Grounded theory approach

Asenahabi (2019, p. 83) defined grounded theory as "a design of inquiry where a researcher derives a general, abstract theory of a process, action, or interaction" from the perspectives of the studied population. While phenomenological research aims to describe an event, grounded theory aims to offer an explanation or theory behind the occurrence of the events (Charmaz, 2001). Data in grounded theory are collected in a naturalistic environment using observations and interviews. A researcher has to compare data from primary research and what has already by uncovered from previous studies on the same phenomenon. Grounded theory is more about generation rather than testing hypotheses (Charmaz, 2001).

5.5.5 Case studies

Case studies involved an in-depth examination of people or groups of people or institutions. In

this approach, depth means to investigate all characteristics of the case. The main aim of case studies is to offer accurate and complete descriptions of a case to expand existing knowledge on human behaviour (Creswell, 2009; Asenahabi, 2019). In the healthcare industry, case studies are mostly concerned with exploring the aspects associated with diseases (e.g. factors contributing to the development of a specific disorder) (Tenny, Kerndt, and Hoffman, 2022). This research approach can be quantitative or qualitative, depending on a research's aim and design. Case studies can be considered qualitative when a researcher aims to understand people's experiences (Asenahabi, 2019). The current study is not concerned with diagnosing their level of post-traumatic stress nor their experiences of dealing with the traumatic event itself. It was purposed to identify potential ways to tailor existing interventions aimed at minimising the effects of post-traumatic stress by giving participants' a voice, and therefore a case study was not appropriate for this study.

While the above discussion offers an explanation of the different approaches to qualitative research, I opted to use a pragmatic method approach rather than the generic methods provided in the past to answer the research questions. Moreover, I chose semi-structured interviews for data collection and thematic analysis for data analysis. This is because semi-structured interviews allowed me to understand participants' experiences better and generate rich and descriptive data appropriate to reach conclusions. The thematic analysis allowed me to find patterns and themes in collected data, which is crucial to understanding underpinning problems and possible solutions to the problem under study.

5.6 Data collection methods

There are different methods of data collection in qualitative research. The next section offers an overview of different methods that have been used in qualitative research to collect data, including observations, interviews, and focus groups.

5.6.1 Qualitative observations

Creswell (2014) described a qualitative observation as when a researcher takes field notes on the behaviour and activities of individuals at a study location. This method of data collection has its roots in ethnography. A researcher can choose to formulate questions before the observation that will allow easiness in collecting data (Creswell, 2014). In addition, observers may choose to participate in the research setting or completely abstain (Busetto, Wick and Gumbinger, 2020). Researchers ask open-ended questions to participants when using observations to collect data (Howitt, 2019). While qualitative observation could provide the research with a better position to

understand the viewpoint and experiences of participants, the observation might affect the behaviour of the group being observed, which might affect the reliability of the study findings (Creswell, 2014). In addition, different researchers might reach different conclusions from similar behaviours, which affects the objectivity of the research (Howitt, 2019). Qualitative observations are also preferred in research settings where the researcher aims to document what people do rather than what they say (Busetto, Wick and Gumbinger, 2020). A qualitative observation was not appropriate for the current research.

5.6.2 Focus groups

This data collection method involves a group interview that utilises interaction among respondents as a source of data (Howitt, 2019). The main aim of focus groups is to explore participants' expertise and experiences while understanding why people behave in certain ways. In focus groups, the researcher becomes a moderator who steers the discussion, reminding participants of the original focus of the group and prompting respondents to respond to issues raised by other participants. The moderator should ask questions that steer the conversation in the direction that answers the intended question. One of the key advantages of using focus groups to collect data is mobilising participants to respond to and comment on each other's contributions (Creswell, 2009; Howitt, 2019). In doing so, the researcher can collect rich and descriptive data from the interactions. Such data offer insights to the researcher on how attitudes are formed and altered. Unlike interviews, the presence of other participants may motivate more contribution without fear. Focus groups offer participants strengths in numbers (Howitt, 2019). Therefore, they can debate the topic under study, and the researcher has access to rich data. In addition, focus groups are inexpensive, easy, can be conducted rapidly, and are most appropriate for studying a homogenous group of people (Busetto, Wick and Gumbinger, 2020).

While there are numerous advantages to using focus groups, they are inappropriate for sensitive subject matters (Busetto, Wick and Gumbinger, 2020). It is difficult to collect data on sensitive topics (such as the effect of traumatic situations on the mental well-being) from focus groups because people may not be open to discussing this issue with or in the presence of others. For this reason, focus groups were not appropriate for the current study given the setting and the topic.

5.6.3 Qualitative interviews

The third method of data collection are interviews. Howitt (2019) defined qualitative interviewing as involving questions and probes intended to encourage the interviewee to talk freely and

comprehensively about the topic under study. The main aim of qualitative interviews is to collect in-depth information from research participants. Different elements such as a researcher's interviewing skills, the topic, and the participant's ability to produce good qualitative data determine the success of a qualitative interview (Creswell, 2009; Howitt, 2019). Qualitative interviews give the researcher more control over the data collected because of the questions prepared before sessions. Interviews can be structured, semi-structured, and unstructured. The strengths and weaknesses of qualitative interviews will be discussed later in this chapter.

5.6.4 Structured interviews

According to Howitt (2019), structured interviews involve asking predefined questions in a standardised order. This process primarily involves the interviewer reading from a list of questions while the interviewee selects responses from a separate list of potential answers for each question. Structured interviews provide little opportunity for the interviewer to ask questions that are not planned and predetermined. In this regard, the researcher must ensure that the subjects were chosen for the study meet sampling requirements. As Howitt (2019) argues, structured interviews may alienate the respondents because the interviewer gives them limited choices. Therefore, the interviewee may feel that they cannot communicate their actual views effectively. While such interviews may be easy to analyse, they fail to capture participants' full experiences and perspectives. In this regard, this method of interviewing was not appropriate for the current research.

Semi-structured interviews

The second technique is semi-structured interviews. Semi-structured interviews vary greatly in terms of pre-planning. Howitt (2019) noted that a researcher has to have a list of questions that require exploring for semi-structured interviews. However, these questions do not have a rigid structure like structured interviews. According to Bryman (2004) and Silverman (2011), the use of semi-structured interviews is considered more effective in obtaining detailed responses than structured interviews, as this approach creates a more natural discussion between the researcher and the interviewee. This also provides participants with the freedom to express their opinions and views in their own words.

Semi-structured interviews are interactive and allow unexpected topics to arise and be discussed by the researcher and the interviewee (Howitt, 2019). The use of semi-structured interviews for this study helped overcome any bias. Like unstructured interviews, semi-structured interviews produce rich descriptive data required to answer the research question fully. In addition, semi-

structured interviews require that the researcher prepares before the session to ensure that they are well-prepared to guarantee the success of the data collection process (Bryman, 2004; Howitt, 2019). Interviews are conducted one-on-one, which offers participants privacy to discuss issues openly compared to focus groups. The sensitivity of this study's topic required that data be collected privately with each individual. Prior preparation was also needed due to the topic's sensitivity. In this regard, semi-structured interviews were most appropriate for the current study.

Unstructured Interviews

Unstructured interviews are the last category of interview techniques. Howitt (2019) reported that these interviews are not pre-planned and happen spontaneously. Unstructured interviews are best for collecting data about personal experiences. A researcher asks open-ended questions on the topic under study, and the interview flows like a natural conversation (Patton, 2002). For these types of interviews, the researcher has the freedom to modify the question to suit the subject's specific experiences. Compared to structured and semi-structured interviews, the last interview technique allows for more flexibility and adaptability depending on a subject's responses. Unstructured interviews were deemed inappropriate for this study, as their high flexibility may permit the generation of new thoughts and subjects, which in turn could decrease the generalisability and reliability of the findings (Patton, 2002; Howitt, 2019).

5.6.5 Strengths and weaknesses of qualitative interviews

Employing qualitative interviews as a data collection method has numerous benefits. Qualitative interviews allow the researcher to form a deeper understanding of participants' views, opinions, and preferences on certain subject matters (Roller and Lavrakas, 2015). Interviews require an interviewer to interact with the interviewee at a personal level. According to Howitt (2019), a researcher has to form a rapport with the interviewee to ensure that data collected from the interview is useful in a study. Forming a rapport with a participant offers an opportunity to have a deeper understanding of their experiences and perspectives. For this study, I understood the experiences – including encounters with barriers and facilitators – faced by EMS personnel when seeking mental health support. Participants were able to discuss their difficulties, beliefs and preferred methods of coping with their challenging roles, making it easier for me to formulate solutions and/or ways of adapting existing interventions aimed at mitigating post-traumatic stress.

Moreover, qualitative interviews allow researchers to collect rich and descriptive data (Creswell, 2014; Roller and Lavrakas, 2015; Howitt, 2019). Qualitative interviews offer researchers an opportunity to collect more in-depth information than any other data collection method. Due to its

semi-structured nature, an interviewer can choose to follow up questions with sub-questions that offer more insight into the topic under study. Participants can share their experiences and perspectives in their own words. For face-to-face interviews, the researcher can also make observations beyond what an interviewee is reporting based on their body language. In this regard, an interviewer can understand if a topic makes a participant uncomfortable and can use this information as a follow-up to gather more data.

While qualitative interviews have numerous advantages, this method also has some limitations. Qualitative interviews require extensive resources. Collecting and analysing data from semi-structured and unstructured interviews may require more time than other methods. In addition, analysing the large amounts of data collected from interviews takes lengthy periods. As Howitt (2019) notes, qualitative interviewing may also affect a researcher's mental health because of being exposed to the participant's social problems.

Interviews depend on people's ability to understand and respond to questions posed by the researcher (Roller and Lavrakas, 2015). However, not everybody can articulate and present their position. The main aim of qualitative interviews is to collect rich and descriptive data. If participants cannot articulate their views, it becomes impossible to gather relevant data, which affects the outcomes of a study. In addition, qualitative interviews depend on participants' ability to accurately and truthfully remember details about their perspectives, opinions, and circumstances. Some respondents may fail to offer truthful accounts of their experiences, which affects a study's findings. Howitt (2019) highlights the importance of the researcher-interviewee relationships during interviews. The researcher might be biased in the context of data collection. When a researcher has a predetermined outcome for the interview, it becomes difficult to remain objective. In addition, some personal characteristics such as gender and race may affect how a researcher interacts with interviewees. Strong personal values for the researcher may also limit their open-mindedness when collecting data on strongly opposed issues (Creswell, 2014; Roller and Lavrakas, 2015; Howitt, 2019).

5.7 Chapter summary

This chapter discussed qualitative methodology, the different study designs used in qualitative research and methods for collecting data. This thesis implements a pragmatic approach to answer the study’s research question, using semi-structured interviews. The rationale for this approach and these data collection techniques were discussed in this chapter, along with the strengths and pitfalls of qualitative interviews.

CHAPTER 6: METHODS

6.1 Introduction

This chapter describes the methods used for sampling, data collection processes and the analysis. The chapter particularly discusses the setting and selection of the study site, choice and size of the sample, recruiting and sampling procedures. It specifically addresses category choices for the population sample extraction, the criteria for the sample selection, the justification for the final sample size and the reasons that choice was relevant. The chapter further explores the detailed recruitment of frontline staff, supervisors and managers, as well as the criteria for excluding part of the population and for including participants in the study. Further, the interview procedure, including the provision of an overview form and matters regarding confidentiality, appears here. The chapter then proceeds to describe aspects pertaining to data collection, materials that include semi-structured interviews and the guide through the interview. The last items in this chapter include my position as a researcher, conducting the pilot study, thematic analysis, data coding, ethical considerations and the overall chapter summary. Therefore, the chapter's significance for the research question is explained, as it entails every procedure that contributed to achieving the research's main specific objectives.

6.2 Setting

Participants were recruited from two EMS corporations in the UAE. These are:

- Dubai Corporation for Ambulance Services (DCAS)
- National Ambulance (NA)

These are the largest EMS corporations in the UAE, and they currently have more than 1900 EMS personnel working in the field.

6.3 Sample selection and size

One of the challenges of conducting a qualitative study is, before the process of data collection begins, to identify the number of participants to obtain (Baker, Edwards and Doidge, 2012). According to Vasileiou *et al*. (2018), sample selection is one of the critical components of qualitative studies, a matter of conceptual debate. The size and composition of the sample indicate the appropriateness and adequacy of qualitative research studies (Vasileiou *et al*., 2018). The sample size of a qualitative inquiry tends to be smaller than in a large-scale quantitative research study. Qualitative inquiries focus on obtaining in-depth case-oriented data that provides

a detailed understanding of the research setting (Sandelowski, 1996). The sample typically has fewer respondents because the researchers select only those from the population who fulfil the essential research criteria and can respond adequately to the interview questions. In general, qualitative studies seek a sample size ranging from 20 (Green and Thorogood, 2009) to 50 participants (Ritchie, Lewis and Elam, 2003).

According to Saunders, Lewis and Thornhill (2009), a sample population is a number of individuals representative of the population of interest, as a whole. Qualitative research generally uses nonprobability sampling techniques, while quantitative research uses probability sampling (random sampling). Nonprobability sampling techniques include convenience (also called 'haphazard'), judgemental (also called 'purposive sampling') and snowball sampling (Patton, 2002; Creswell, 2009). Qualitative studies also commonly use purposive sampling, beneficial in identifying cases that hold valuable information for the research project (Patton, 2002). This technique involves identifying and selecting participants who either have experience with or knowledge regarding the issue under study, in line with "the objective and needs of the study" (e.g. the area of interest) (Shaheen and Pradhan, 2019, p. 28). Ensuring that these participants are interested in taking part in the research project and can effectively share their experiences and express their views and opinions is essential (Bernard, 2002; Shaheen and Pradhan, 2019). Consequently, this study used a purposive sampling technique to recruit potential participants, which helped gather vital data effectively because I selected only those with knowledge and experiences in the matter under investigation.

This research is not quantitative; thus, I chose nonprobability sampling methods. Additionally, the focus was on gathering quality data to enable forming a solid foundation for future research. In this case, I targeted those individuals with the most viable information, justifying the use of purposive sampling. According to Shaheen and Pradhan, (2019), the basis of purposive sampling is the proposition that information-rich samples will provide the researchers with an in-depth view of phenomena. In this case, the research focuses on identfying the key principles that EMS organisations should consider when tailoring existing interventions for reducing or preventing post-traumatic stress to the context of emergency medical personnel working in the UAE. Therefore, I selected the EMS personnel and their supervisors and managers in the UAE because they are most aware of the topic.

The UAE is a demographically diverse country, with EMS staff of multiple nationalities and backgrounds working in the service. The largest proportion of the workforce are ambulance workers who work on the front line dealing with critical incidents, which is reflected in the sample

size. To eliminate any bias, I used purposive sampling to select participants with various characteristics, deploying several criteria during recruitment to ensure an inclusive sample.

As mentioned in chapter 1, frontline staff in these organisations consists of three levels: EMTs, paramedics and advanced paramedics. Hence, using a maximum variation sampling method, I ensured participant diversity, to increase the transferability of the results. This also ensured the selection of people of different genders, lengths of service, and nationalities (more than half of the frontline staff are expatriates, predominantly from India and the Philippines).

From managers and supervisors, I expected similar responses regarding the strategies put in place to curb such conditions and their respective outcomes. As such, picking a sample size of five managers is not only economical but also saves time and other resources, justifying that decision. Notably, most individuals holding managerial positions in both organisations are Emiratis. Hence, choosing at least two from DCAS and two from NA was prudent. I also intended to get one more interview with a manager, to ensure achieving data saturation (e.g. no new themes emerging). The same applied to interviewing shift supervisors; these employees are Arabs (either Emiratis or Jordanians) who had worked as frontline staff in the past. It is important that the sample size remains flexible and under the control of research objectives. In other words, if I felt the need for further information on certain themes, or new themes emerged after interviewing the selected number of participants (30 interviews), then more interviews would occur to reach data saturation.

Another rationale for the size is that it is small enough to allow me to obtain in-depth data during the interviews. The basic grounds for the decision on sample choice was the study's qualitative nature. In particular, qualitative research has a contextual sample size that partially depends on the scientific paradigm for undertaking the study (Boddy, 2016).

The sample comprises

- 20 frontline staff, namely the EMS staff (EMTs, paramedics and advanced paramedics) who directly respond to a range of emergency needs. The sample included:
    - Ten frontline staff from DCAS and ten from NA
    - Three Indians, three Filipinos, three Arabs and one more from either India or the Philippines (because representation of these nationalities was larger)
- Five supervisors (at least two from DCAS and two from NA) charged with supervising and providing support for the frontline staff.

- Five department managers (or head of sections) (at least two from DCAS and two from NA) responsible for ensuring the implementation and development of the policies and the management of resources to achieve organisational goals

In this context, the basis for choosing the 30 participants had not only qualitative grounds but also the convenience of getting organisation workers to participate in the study. The issue regarding convenience arises in that EMS workers were doing 12 hours of shift work (the extended shift length due to the pandemic). Besides, I chose workers willing to take part in the study to represent the entire population. This increases the chances of either expanding or reducing the sample size, depending on information requirements. For instance, in a situation where the study is complete, yet I still feel the need for more information, there is room and convenience to try to persuade more participants to help meet the target. When I feel that data saturation of data has been obtained and no more new themes are emerging from the study, then interviewing stops.

6.4. Sample recruitment

6.4.1 Recruitment of frontline staff

Having understood the nature of the participants for purposive sampling, outlining the recruitment of frontline staff follows. The survey (see Appendix 5 for full details of the survey) was undertaken for the purpose of recruiting participants working as frontline staff for the study. The organisation's leadership (with the coordination of the Strategy and Excellency Team in DCAS and the head of the NA research unit) circulated the online survey (via the Qualtrics platform) that was sent to all frontline EMS staff in both organisations. The leadership in both organisations agreed that only the researcher would access survey responses.

The survey allowed for the creation of a sampling frame to select participants from all training levels, to maximise variation in experiences and ensure that selected participants represented differences in nationality and years of service. Also, I paid attention to the demographic characteristics of the population. A mix of people with different genders, nationalities, years of service and ages was recruited. Such variable demographic characteristics represented an important step in ensuring that the topic of interest—tailoring interventions for post-traumatic stress—would be analysed from different angles, as well as understanding the personal beliefs and the preferred sources of support that these individuals adopt, and whether these differ between them by nationality, years of service or other variables.

The front page of the survey (see Appendix 5) included an overview form, containing information

regarding the reasons for the study, its importance and relevance, its possible effects and the fact that participants would not receive any personal benefits from the research. Moreover, the page acknowledged that some of the survey questions might elicit a memory of a distressing case that may upset some participants. In addition, information regarding data confidentiality, data management and research team contact information were all on that page, distributed prior to obtaining consent to participate in the survey.

The first set of questions in the survey comprised demographic questions, followed by questions related to experiencing a distressing case. It also included a short PTSD inventory adopted from Hansen *et al.* (2010), to assess whether potential participants were or had been experiencing any post-traumatic stress symptoms. The inventory comes in a table format, in which participants tick symptoms they have experienced since the case, along with the symptom frequency. It also asked participants questions about the timing of their experiencing the distressing incident (more than three months or less) and whether these symptoms remained for more or less than a month (duration of symptoms) as a way of excluding them from the interviews. Interviewing participants who had dealt with a traumatic event in the last three months or had exhibited recent symptoms of PTSD might aggravate incident-related reactions or lead to worsening of symptoms.

All questions (except for the PTSD short inventory and incident description) were in multiple-choice format; those are quick and simple to answer, and staff members are more willing to engage in such a survey. One open-ended question required respondents to briefly describe the critical incident. I wanted to leave a space for participants to describe the distressing incident they encountered in their own words. This was also helpful when checking which participants seemed more likely to communicate about their experience, and who would not feel like talking about it (for example, those who would just write two words about the incident would be less likely to communicate or be open during the interview than those who describe the incident in paragraphs). Finally, those willing to participate were asked to provide their email addresses at the end of the survey, to be contacted later by me with a view to participating in an interview. Filling out the survey took about 10–15 minutes. However, this range was flexible, depending on the participant's information.

Based on their answers and characteristics, I selected participants and contacted them by email to ask if they were willing to take part in the forthcoming study. In particular, the criteria for selecting frontline staff involved participants who had at least one year of experience and had encountered a distressing case more than 3 months previous. The participant information sheet went to those who agreed to participate. This sheet provided in-depth information about the study,

with detailed information and the procedures it would follow (see appendix 6 for full details of the information sheet).

I removed personal identifying information from the survey responses and stored it separately until no longer needed for the study (e.g. after finishing all interviews and ensuring no need for additional interviews). This was an important step towards ethically maintaining the study participants' privacy, key to keep in mind when the purpose of the study is to tailor interventions to make them feasible, deliverable and acceptable for the staff, not to assess their post-traumatic stress symptoms or level of PTSD.

Figure 5 below shows the process of recruiting frontline staff.

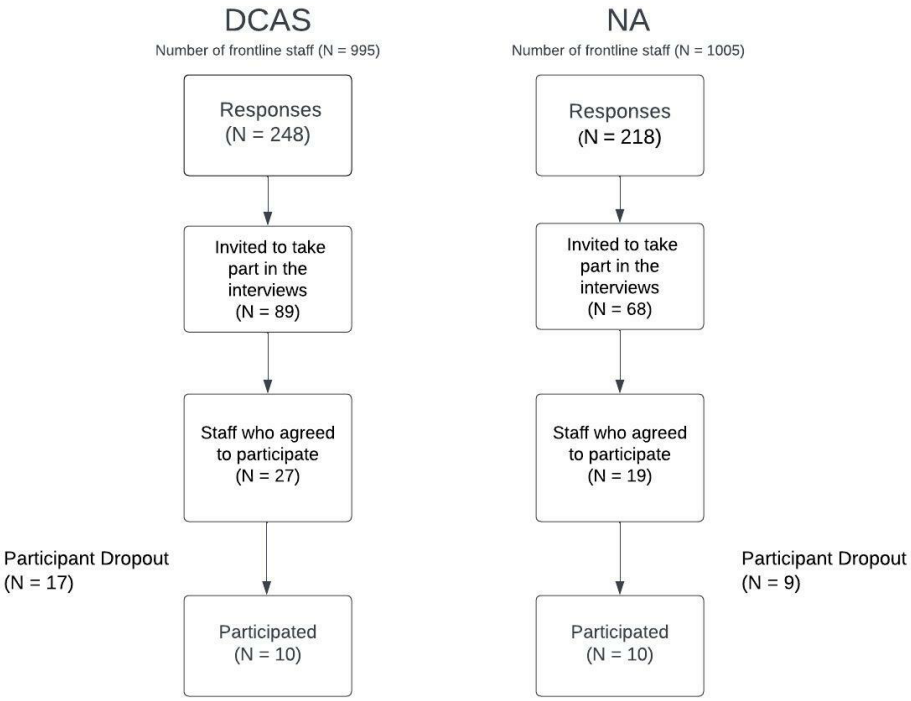


Figure 5: Recruitment of frontline staff.

6.4.2 Recruitment of supervisors and managers

I provided information about the study to the Dubai Ambulance and National Ambulance leadership who gave permission for the research to take place in the organisations. The recruitment of supervisors and managers within the two EMS services mainly occurred using email addresses.

- As an employee at DCAS, I received the necessary permission to circulate emails to potential study participants.

- Recruiting supervisors and managers working at NA involved sending an email to the head of the research unit, who coordinated with all the shift supervisors and head of departments and provided them with my email and contact details. If they were willing to participate in the study, they were asked to contact me.

All participants were sent an email which included a brief overview of the study and informed the recipients that upon accepting the invitation to participate, more details would follow. In total, 42 emails were sent (16 to DCAS and 26 to NA), aiming to get at least 20 positive responses (at least five responses from managers and 15 responses from supervisors) as there were fewer department managers than shift supervisors.

6.5 Inclusion criteria

Frontline staff with at least one year of experience working in the field were eligible to participate, under the assumption that the majority of such workers must have undergone a critical incident of some kind. Including those who had dealt with a distressing incident was important to assess whether they experienced symptoms of post-traumatic stress, their ways of coping with it and their views of available sources of support, informal or formal. Also, this study was conducted in English; only workers conversant with the language were eligible for the study which was not considered an issue as the first language for communicating with the frontline staff was English in both organisations.

The managers and supervisors were all Arabs, for whom English language was not an inclusion criterion. The only criterion for this group was that a respondent must have worked in the organisation for at least one year. This provided a desirable level of experience in addressing the facilitators and barriers to implementing interventions, well known within the policies and resources in place, the services and what frontline staff considered feasible and acceptable.

6.6 Exclusion criteria

The basis for implementing exclusion criteria for frontline staff came from respondents' answers to the survey. EMS professionals who had encountered a traumatic event in the past three months and those who seemed to exhibit severe or recent symptoms of PTSD were excluded. Those professionals might have had some emotional discomfort or experienced a worsening of symptoms when asked how they dealt or coped with the distressing incident and, at times, not be open enough to discuss their conditions. Except for the one year of experience in their position, no exclusion criteria applied to supervisors and managers.

6.7 Interview procedure, consent, and confidentiality issues

Prior to the interview I provided detailed information about the study and asked individuals who agreed to participate to sign a consent form, at which point both parties (me and the potential participant) arranged a mutually agreeable time and location for the interview. I also advised participants that they had the right to withdraw from the study at any time without needing to explain their reasoning.

Moreover, supervisors and managers who sent an email confirmation agreeing to participate received the study's information sheet (appendix 7). Possible interview dates were scheduled from among several options, so participants could choose what was convenient for them. The recruited participants received the consent form, with detailed information regarding the qualitative study.

Not every selected participant was available to be interviewed, which explained the need to make prior appointments, and they were made with all respondents before the interviews began. This helped to ensure reaching the target sample size, and all participants were ready to be interviewed.

The schedule changed somewhat because the work rosters for the EMS staff changed (among other things, the coronavirus pandemic caused the shift's working hours to change). Appointment confirmations were made several days before the scheduled interview time, to avoid inconvenience while upholding the research purpose.

Before taking part in the interview, every participant received assurance of the information's confidentiality. Also prior to the interview, I reminded EMS workers of the focus of this study and its purpose, and that data would only be shared with my PhD supervisors. This served to make clear that the project was not concerned with diagnosing their level of post-traumatic stress nor their experiences of dealing with the traumatic event itself. I again reminded all participants that all information collected for the study would be kept strictly confidential.

In terms of protecting participants' confidentially, email addresses included in the survey (considered personally identifiable information) were kept separately in an encrypted folder until no further contact was needed, after completing all interviews and ensuring diversity in the characteristics of selected participants. Moreover, participants were advised not to disclose any personal information during the interview, nor to mention any identifying information relating to themselves or their patients.

Nevertheless, I informed participants that I would breach confidentiality in exceptional

circumstances, such as when someone was very distressed and would not discuss any form of help-seeking or if there was a risk to life (e.g. disclosure of thoughts of suicide). In cases like these, I would have legal obligations that override confidentiality agreements. I remained clear about these precautions at the point of seeking consent. It is worth noting that this a legal process that is carried out within the EMS organisations in the UAE; since I am an employee in one of the organisations, I am obliged from a professional point of view to take this action if needed (while not contravening any ethics approval from the university).

6.8 Data collection

6.8.1 Interview guide

This study used semi-structured interviews with open-ended, focused questions because they often provide insight into participants' views, beliefs and perceptions while allowing the interviewer to focus on specific issues. Using this method helped me to explore the principles to consider when tailoring current interventions, through meaningful questions that assess the feasibility and acceptability of those interventions. In a semi-structured interview, the researcher proceeds with an interview guide or questions to be covered for the research but with the privilege of asking probing questions and gaining further clarification from the participants. This approach has helped to identify in-depth perspectives from a wider range of participants. The secondary data from the literature review informed the development of interview questions (see appendix 8 for full details of the interview guide for frontline staff and appendix 9 for details of the interview guide for supervisors and managers).

The design of the interview questions enabled me to collect as much information as possible regarding the feasibility and acceptability of pre-existing interventions, to prevent or reduce post-traumatic stress by tailoring them to fit EMS organisations in the UAE. Every interview was recorded using an encrypted voice recorder device. The number and sequence of the questions varied based on what the interview process required. The interviewees also had enough scope to express their thoughts and feelings, as most of the questions were open-ended. A good interview session should last an estimated 60–75 minutes. However, the time limit could be extended or shortened, depending on participant cooperation and emotions during the study.

6.9 Researcher's position

In addition to this being a sensitive research topic, a number of respondents involved work in the same organisation I work in. Therefore, I actively avoided interviewing employees with whom I

had a close working relationship. I also decided to start by interviewing employees from NA before interviewing employees from DCAS, to prevent any bias that my position as an employee at DCAS could generate.

Further bias could have arisen from the fact that I had my own experience with the research problem. Therefore, a further aspect of the interview guide is to design the interview questions from a neutral perspective without making any reference or connection to my opinions. Therefore, both my PhD supervisors reviewed the topic guide to ensure that I took a neutral position while doing the interviews; this was key in avoiding any bias in the collection and analysis of data. Also, the supervisors reviewed the interview transcripts frequently and provided feedback on better ways of asking questions, to ensure that I avoided any bias.

As a researcher, completely minimising bias, including sampling and non-sampling biases, was vital to achieving the research objectives. For instance, an influenced sample choice could result in a predetermined judgement, a factor that could change the study results and, hence, fail to meet the purpose. Focusing on minimising bias also allowed me to present a good picture as a researcher to the participants, convincing them further to participate in the study and give all the available necessary information. In other words, I detached myself from the research problem and relied on the knowledge and experiences of the subjects.

Additionally, it was my job to access the feelings and thoughts of the participants. This is a role that requires one to be a good judge of emotions, to better understand feelings and expressions. Some of the questions were expected to be personal (for instance, what was different about a case? Why was it highly distressing?). For such questions, I ensured that I had adequate knowledge in handling them, without offending or raising participants' emotions while getting the right message, through the literature and my supervisors' guidance.

6.10 Pilot study

Conducting a pilot study before carrying out the fieldwork is prudent, to evaluate the efficiency and validity of the interview schedule. Efficient pilot studies are likely to ensure the study's quality, providing the researcher with views on instances of weakness in the study's design and challenges that may arise when conducting the proposed research (Malmqvist ***et al***., 2019).

I piloted the interview guide with three frontline staff (one from NA and two from DCAS) and one supervisor (from DCAS), asking the interviewees for their feedback regarding the questions. This feedback, which mainly related to the terminologies used in the questions and the question order,

was used to make the interview questions and terms used clearer and more understandable to all participants. Interviews were conducted face-to-face with the participants in a private meeting room at the respective organisations' main building, each for approximately 40–45 minutes.

The important purpose of a pilot study is to determine whether the selected method can accomplish the research. According to In (2017, p. 601), pilot studies are often conducted on a smaller scale and intended to check the quality and efficiency of the main study. Therefore, they require designing and implementing a pilot study similar to the main research. Additionally, I was unaware of how much information can be obtained from one individual or which questions should be asked to derive the most detail from a participant. The pilot study addressed all these issues. Data from the pilot study was not incorporated into the main study.

6.11 Data analysis

As the key component of this study, the interview data requires an appropriate qualitative analytic approach to unlock insights. The data were analysed using the NVivo program. Analysis for this study was primarily thematic, as discussed below.

6.11.1 Thematic analysis

Lester, Cho and Lochmiller (2020, p. 97) argue that thematic analysis can be an 'umbrella term' that denotes different approaches to identifying patterns across qualitative datasets. The broad and flexible nature of thematic analysis also means that this method is applicable across many disciplines that use qualitative data. Thematic analysis a fundamentally important technique for qualitative data (Braun and Clark, 2006). The authors also complement its conceptual flexibility and the ability to uncover patterns, motifs and meaningful relationships in data. Thematic analysis identifies, analyses and records commonalities (themes) in evidence (Braun and Clark, 2006).

In research, seeing patterns is an essential part of the job. A code may be a single phrase or brief sentence that metaphorically allocates a comprehensive, prominent and evocative feature for a section of speech or pictorial information (Saldaña, 2021). Saldaña, (2021) further explains the first and second phase coding processes, in which a primary, extensive list of symbols is whittled down and streamlined to produce a subsequent, more general listing of theme groupings and interpretations. Furthermore, Braun and Clarke (2006) outline the process of conducting thematic analysis in six steps: familiarisation, the generation of preliminary codes, the search for overarching themes, the review of themes, defining and naming themes, and producing the final report.

Familiarisation

The first step of the process is familiarisation, wherein the researcher needs to become familiar with the data (Braun and Clarke, 2006). For this study, I conducted familiarisation as I reviewed the data collected (interview transcripts and notes) to obtain a complete understanding of the collected data. In this step, I become familiar with the data during and after the process of transcription of the interview data; transcripts are read and audio recordings listened to multiple times. The transcription process is crucial, because it provided me with a unique opportunity to engage with the data while verifying the accuracy of the transcription. I also observed emergent trends and took relevant notes (documented in my research notebook) that helped inform the next step.

Generation of preliminary codes

Braun and Clarke (2006) explain that the process of generating codes is akin to identifying the key features of the data. Generating initial codes is the process of assigning the data to basic groups. This is a crucial step that sets the framework for further analysis and interpretation of the data (Braun and Clarke, 2006). Thus, the researcher needs to be rigorous and must not ignore discrepant data.

In generating the preliminary codes, I adopted an approach that was more circular rather than linear in nature. The first step was to develop data-driven codes that emerged from the data and uncover predominant patterns. The second step involved seeking out hard-to-find information and discrepant data that could be coded. The third step involved reviewing the research questions and then coding the data to ensure that the research questions were fully answered. Thus, the coding process was iterative; it required me not only to assess the data using a fine-toothed comb but also to step back and evaluate whether the research questions had been answered. Using this iterative process, I was able to reduce the vast amount of data to a more manageable set of codes, which were organised into themes in the following step. An example of coding is given in the following table (table 2).

Table 2: Example of coding

Coded for	**Data**
1. Avoidance (coping strategy)	"*I even started avoiding, avoid going to certain areas that would remind me of that case*" (EMT_M_15)

Coded for	Data
2. The culture of the organisation	"*If you think about it, other jobs for example doctors and nurses in healthcare clinics do not have that sense of weakness when discussing or bringing out such subjects... I feel it is something more relatable to us who work in ambulance services*" (PMED_M_0.3)
3. Timeouts for better functioning	"*Such breaks are critical. They will help to refresh, clear your mind, and find new resources to work effectively*" (PMED_F_19)

Theme development

Before conducting thematic coding, I carried out axial coding. This process involved the grouping of large amounts of codes into logical and conceptual categories (Scott and Medaugh, 2017). Accordingly, categories were created based on the codes generated in the previous step; the categories were then logically grouped based on conceptual sense-making. For instance, codes such as 'More about organisational metric', 'Does not allow open discussion about feelings', 'Allow discussion about improvement in areas related to technical and operational stuff'; and 'Suggestions to address psychological aspects of events in debriefings' were all grouped together under the category of debriefing as an intervention offered in the workplace. This category is coherent because the aligned codes all describe the effectiveness of debriefing as a platform for mental health support within the service. A total of 16 axial codes were created from 129 codes.

Furthermore, the process of thematic coding was theory-led, wherein I organised the axial codes on the basis of whether they contributed to answering the research questions. For instance, for RQ1 (*What are the perspectives and experiences of EMS personnel regarding current workplace interventions?*), the following axial codes were grouped together: debriefing as an intervention offered at the workplace; the role of supervisors; the facilitating role of peers in seeking mental health support; and barriers to seeking mental health support. The themes that resulted from aligning these categories together included: experiences of professional support and experiences of informal support.

Defining and naming themes

The next step in the process of thematic analysis is the definition and naming of themes. This was undertaken concurrently with the process of coding and thematic development, as indicated

above. It can be noted here that thematic analysis is a non-linear process, with several steps occurring simultaneously (rather than one after the other) (Braun and Clark, 2006). Braun and Clarke (2006, p. 87) define this step as the 'ongoing analysis for refining the specifics of each theme and the overall story that the analysis tells, generating clear definitions and names for each of them'. This was carried out carefully, while ensuring that short and clear phrases were used to name the themes. The themes presented in the preceding chapters reflect the final names that were assigned to them.

Writing the report

This stage involves the reporting of data that has been coded and organised thematically. This reporting also includes the 'selection of vivid, compelling extract examples, the final analysis of selected extracts, relating back of the analysis to the research question and literature, producing a scholarly report of the analysis' (Braun and Clarke, 2006, p. 87). Direct extracts were used as illustrations to describe the coding and the themes in greater detail. The results are presented in Chapters 7 and 8.

6.11.2 Synthesis of findings and development of logic model

This thesis included an additional stage which synthesised all the findings from the qualitative interviews (Chapters 7 and 8) with the findings from the systematic review (chapter 3), to create a logic model. The theory of change (ToC; Weiss, 1995) was incorporated into the process of building the study's logic model, which is presented in Chapter 9.

6.12 Ethical considerations

In order to ensure that no harm comes to the study participants or anyone else who could be engaged in this research, it is essential that the researcher keep ethical concerns in mind. It has been emphasised by Hammersley and Traianou (2012) that researchers must prevent potential damage to individuals, support individuals' freedom throughout the collection of data, preserve individuals' anonymity, enable individuals' exchange and respect individuals equitably. In line with the above, the following section outlines the ethical considerations that were taken into account during the research process.

Obtaining ethical approval from the university: The first step was to gain ethical approval from the University of Sheffield's ethical committee. Ethical approval to carry out the study was granted on 12/10/2020. The University Ethical Approval form can be found in Appendix 10.

Approval from EMS organisations: Ethical permission from both organisations (DCAS and NA)

was obtained when I contacted the research committee through email and asked about the necessary steps for approval. Responsible staff in the research unit were briefed on the study and were provided with supporting materials, such as the information sheet and the types of questions included in the survey and interview guide. I was thereafter requested to provide all relevant materials in Arabic (that is, documents were translated by me from English to Arabic). In response, the appropriate authorities issued a letter of consent, allowing the study to proceed. DCAS and NA Ethical Approval forms can be found in Appendix 11 and 12, respectively.

Information and consent for participants: All of the adults included in this study were contacted in a way that ensured their complete permission and informed consent. All eligible individuals received the information sheet about the study. Before commencing data collection, participants were told that their engagement was optional and that they would be free leave at any time without any consequences. Participants were asked to sign a consent form indicating their agreement to participate in the study (see Appendix 13).

Sensitive nature of the topic: I understand that the subject of the research study could be sensitive for the EMS personnel interviewed. All frontline staff are likely to have encountered at least one traumatic event, and some might find it difficult to talk about it. Although I did not discuss details regarding participants' experiences with critical incidents, some questions could have recalled past distressing incidents. For this reason, if a participant should withdraw during the interview (for instance, if a participant felt overwhelmed), I would give him or her the opportunity to request his or her preferred source of support. Furthermore, if a participant began to show signs of severe psychological distress, I would stop the interview and inform a line supervisor of the situation, expecting the supervisor to provide the most appropriate type of support as soon as possible in accordance with organisational policies. This was an important step to treat participants ethically and prevent them from experiencing harm.

Confidentiality: I have a responsibility to protect the anonymity and confidentiality of the information respondents revealed during their interviews. Precautions have been taken to protect the participants' anonymity in this study. Fictional identities and identifiers have been used to conceal the individuals' identities in the presentation of this research. Codes such as PMED_M_0.3 were employed to protect the identity and privacy of the participants. In addition, I reassured the subjects that their privacy and identities would be protected throughout the data-gathering process. Participants were assured that only me and my two PhD supervisors would have access to the transcripts and audio recordings.

Culture: The cultural setting of this research presented a unique challenge for me and for the participants, as mental health issues are not commonly discussed openly in the UAE. I ensured that participants were well aware of the privacy and confidentiality ethics. Interview questions were also phrased in such a way to avoid asking participants about their own mental health issues. For instance, I intended to focus on how each interviewee coped with their reactions following a critical case, as that would make participants more willing to talk about their experiences dealing with adverse reactions to traumatic incidents. By taking a more generalised approach to ask questions, I was able to overcome the challenge of stigma and gain rich insights into cultural considerations for the design and modification of mental health interventions. Moreover, it was important for me to avoid bringing up topics related to drinking alcohol (for example, asking directly if a participant has engaged in destructive coping strategies such as drinking), because the UAE has a conservative culture that might make EMS workers hesitant to discuss such topics with an Emirati researcher.

Power distance: It was important to consider the risk of bias resulting from power distance. I was aware that participants might feel obligated to participate in the study under the pressure of receiving an invitation from an Emirati advanced paramedic. However, I outlined in an explicit and implicit manner that participation was entirely voluntary. Participants were also reassured that there would be no harm to their career progression in the organisation as a result of their participation or non-participation in the study. It was important that I appear neutral and impartial during the interview process to ensure that participants were comfortable, especially if their answers were not socially desirable. Similarly, I avoided asking leading questions that would direct the participants towards a certain answer. Before starting each interview, I reiterated the voluntary nature of the process, with participants having the right to withdraw or decline to answer any questions asked. Both of my PhD supervisors reviewed the topic guide, transcripts and codes generated to ensure that I took a neutral position while conducting the interviews; this was key to avoid bias in the collection and analysis of data. Moreover, my supervisors reviewed the interview transcripts frequently and provided feedback on better ways of asking questions to further mitigate the risk of bias.

Data protection: The original data has been stored in a secure password-protected folder that only I can access. Care was taken to ensure that no information was moved around or left identifiable in a visible or public place. Following completion of the research project, all documents will be deleted and shredded within a five-year period. All guidelines and regulations outlined by the University of Sheffield Codes and Regulations will be scrupulously followed.

Dissemination: Participants were asked if they would like to receive updates regarding the study. Those who did were regularly informed of study updates. Once the study has completed the doctoral review process and has been examined, I will release a copy of the thesis to the interested participants. The participants also have my contact number, in case they have any questions regarding the outcomes of the study. Moreover, it was agreed with the NA management team that a summary of results should be provided to them via an online meeting with the head of research unit prior to final submission of the thesis.

6.13 Chapter summary

This chapter discussed the entire methodological process, including data collection and analysis. The participant recruitment criteria were justified, along with the method of data collection. The use of semi-structured interviews was considered the appropriate choice for data collection, and thematic analysis was selected as the method of data analysis. Based on the criteria for inclusion and exclusion, it was possible to establish the required sample, key for study results. The sample size, selection and flexibility were also discussed, alongside data coding.

CHAPTER 7: DATA ANALYSIS (FRONTLINE STAFF)

7.1 Introduction

This chapter presents data from semi-structured interviews with frontline staff in DCAS and NA, alongside critical analyses of emergent themes.

The survey was conducted to identify suitable frontline participants in both organisations (DCAS and NA). Of the 2000 EMS employees (who received the questionnaire), only 466 responded (see figure 5 in chapter 6). Of the respondents, 20 (summarised in Table 3) were selected for semi-structured interviews using the criteria outlined in Chapter 6. Pseudonyms have been used to protect participants' privacy.

Table 3: Summary of participants' characteristics (n = 20)

	DCAS	NA	Total
Gender: Male	6	7	13
Gender: Female	4	3	7
Age: 18–24	1	2	3
Age: 25–34	3	4	7
Age: 35–44	5	3	8
Age: 45–54	1	1	2
Age: > 54	0	0	0
Nationality: Emirati	3	2	5
Nationality: Filipino	2	3	5
Nationality: Indian	3	3	6
Nationality: Jordanian	1	2	3
Nationality: Other	1	0	1
Position: EMT	7	8	15
Position: Paramedic	1	1	2
Position: Advanced paramedic	2	1	3
Years of experience: < 2 years	1	1	2
Years of experience: 2–4 years	1	2	3
Years of experience: 4–6	1	1	2

	DCAS	NA	Total
years			
Years of experience: 6–8 years	1	2	3
Years of experience: 8–10 years	2	3	5
Years of experience: More than 10 years	4	1	5

There were no changes in the guidelines (in relation to the COVID-19 pandemic) while the interviews were conducted. All participants were interviewed online via Microsoft Teams, as was their preference, except for the three pilot interviews with frontline staff that were conducted face-to-face in a private room at the organisations' main buildings. Each interview session was held for a duration of between 45 and 60 minutes, and most of the interviews were conducted on the participants' days off from work, away from their workplace.

7.2 Emergent themes

Seven primary themes emerged from the data analysis: motivation for choosing an EMS career, consequences of exposure to critical incidents, preferred coping strategies, experiences of professional support, experiences of informal support, interviewees' suggested interventions and strategies, and the views of frontline staff regarding trauma processing interventions.

Table 4: Themes and subthemes

Themes	Subthemes
Theme 1: Motivation for choosing an EMS career	Thrill-seeking, the satisfaction derived from saving people's lives and the need to impact other people's lives positively
Theme 2: Consequences of exposure to critical incidents	Subtheme 2.1: Reactions following a critical incident
	Subtheme 2.2: Effect on performance
Theme 3: Preferred coping strategies	Subtheme 3.1: Cognitive emotion regulation strategies
	Subtheme 3.2: Religious coping strategies
	Subtheme 3.3: The use of humour
Theme 4: Experiences of professional	Subtheme 4.1: Lack of professional support

support	Subtheme 4.2: Helpful professional support
	Subtheme 4.3: Unhelpful professional support
	Subtheme 4.4.: Perceived barriers to seeking professional mental health support
Theme 5: Experiences of informal support	Subtheme 5.1: Supervisor support
	Subtheme 5.2: Peer support
	Subtheme 5.3: Support from family & friends
	Subtheme 5.3: Self-help
Theme 6: Interviewees' suggested interventions and strategies	Subtheme 6.1: Providing time off
	Subtheme 6.2: Professional counselling
	Subtheme 6.3: An online self-help app
	Subtheme 6.4: Raising awareness about post-traumatic stress
	Subtheme 6.5: Creating a culture of recognition
Theme 7: Frontline staff views regarding existing interventions for trauma processing	Subtheme 7.1: Trauma processing

The following subsections provide a detailed description of the outlined themes and subthemes.

7.2.1 Theme 1: Motivation for choosing an EMS career

Three motivations explained the participants' EMS career choices: thrill-seeking, the satisfaction derived from saving people's lives, and the need to positively impact other people's lives. With regard to the first motivation, some participants entered the field of EMS because the job is exciting and action-packed.

> *Every day there is a new case, a new call. I—I mean it is the opposite of having a routine job.* (PMED_M_0.3)

> *It's the adrenaline rush for me, a good adrenaline rush makes it worth the hassle* [chuckles]. (EMT_M_0.9)

Others chose this career because saving and positively changing people's lives is rewarding.

> *Yes, helping people is rewarding. Even if there are times you find it stressful, you still feel satisfied when you make changes to other's life* [sic]. (AP_F_0.1)

I have always seen myself as someone who want to make a real difference to people's lives. (AP_M_0.2)

Moreover, participants' motivations for choosing EMS professions influenced their reactions to the aftermath of critical incidents. For example, those who become paramedics to save people's lives were more inclined to feel to guilt when a patient died than peers with alternative career-choice motivations.

> *Witnessing people's suffering, pain and inability to help someone, sometimes…It really hurts, you get upset. There's a part of you feels guilty for not being able to save someone or protect them from harm. You get me, yeah?* (EMT_M_15)

In addition, workers believed that choosing risky careers compelled them to deal with all job-related hardships, including traumatic incidents.

> *I feel that we gotta handle this in* [sic] *our own; after all, it's us who decided to be in that job. We chose that career and it's a challenging position.* (EMT_F_17)

> *We are the helpers, after all. Right? Anyway, we are the ones who decided to be in this role, so we must show them that we can beat whatever encounter we face.* (EMT_M_16)

7.2.2 Theme 2: Consequences of exposure to critical incidents

This theme demonstrates the multiple outcomes associated with exposure to critical incidents.

Subtheme 2.1: Reactions following a critical incident

Physical reactions

Several EMS personnel reported physical reactions, such as tiredness and exhaustion, following critical incidents.

> *I also felt tired – like, really exhausted the next day. I felt I needed a break after that MCI* [mass casualty incident]. (EMT_M_0.6)

> *Well, to be honest, at that time I felt tired – just tired and exhausted. Felt, like, tiredness, muscle pain, pain all over my body that stayed for probably three days.* (EMT_M_15)

Cognitive reactions

Participants also reported numerous cognitive reactions, particularly feelings of life's unfairness, nightmares, hyperarousal, flashbacks and fear associated with the risky nature of the job. Markedly, staff aged 18 to 34 years experienced cognitive reactions more frequently than their

older colleagues (≥ 35 years). These younger participants reported experiencing recurrent nightmares, flashbacks and negative thoughts more often than their older counterparts.

Fixation on the unfairness of life

The data revealed a tendency for frontline staff to believe that life is unfair upon witnessing trauma dealt to innocent individuals, particularly children and infants. Dealing with such traumatic incidents can trigger a negative cognitive response. Personnel dwelt on the unfairness of life as innocent people suffered incapacitating injuries, pain and death. Significantly, non-Arab participants reported frustration with life's unfairness after exposure to critical incidents more often than Arab staff.

> *He was so young – only 12 years. His life had just started. I mean, it is really unfair.* (EMT_M_13)
>
> *The car accident was not her fault…however, she suffered from it. Life is unfair.* (EMT_M_0.9)
>
> *I remember even when treating the child, I felt it's totally unfair that something like this is happening in the world.* (EMT_M_18)

EMS personnel reported developing the abovementioned reaction mainly after handling cases of severe injury or death in children and young persons.

Nightmares

Some participants reported consistent nightmares that would last several days or weeks after critical incidents.

> *I remember having nightmares for days...I kept thinking about the case.* (EMT_M_0.5)
>
> *I had nightmares about that incident…I remember telling my senior colleague about those nightmares.* (EMT_F_0.4)

Few participants reported that the more a person tries to avoid thinking about the distressing incident, the more likely they are to experience related nightmares. According to one participant, such nightmares are a powerful manifestation of the body's processing of the emotions associated with the critical incident.

> *You know when – it's like you want to stop thinking about it all day, uh, but, yeah, before*

bed you'll think about it…I think that nightmares indicate that the person is processing a series of disturbing emotions…these emotions are articulated in what we see during our sleep. It is more like a powerful way of how the body process all the difficult emotions. (EMT_M_18)

Hyperarousal

Some frontline staff revealed that they experienced 'heightened worry' upon recalling a terrible incident. Others reported sudden-onset irritability and a short temper for days after dealing with a critical case.

Like, people would notice that I get irritated quickly…uh, like, I will get angry over things that usually do not bother me. (EMT_F_0.7)

I kept being anxious and irritated all the time after treating that patient. I remember being restless whenever something reminds me of him. (EMT_M_13)

I felt edgy and kept thinking about her for the rest of the day. (EMT_ F_0.8)

Flashbacks

Participants noted that they experienced flashbacks of the critical incident for a few days afterwards. They would endure persistent negative thoughts as they relived the distressing case.

I had those flashbacks…I kept thinking about her daughter, father, and also grandmother, it was like she was the only survivor…that I wish [sic] *if I did not respond to that case and had to deal with all of that. For me it stayed in my mind for, uh, for days.* (AP_F_0.1)

The day after the case, I have no idea why I started to think of the dead child…it was like re-experiencing the whole scene…he was in my thoughts…I felt bad for not trying to resuscitate him on scene. Although, he showed clear signs of death and there were other patients. But, you know, he was a child. So sad. (AP_M_20)

Fear about the risky nature of the job

Participants expressed fear regarding the risky nature of their job. They emphasised that they often handled assault cases, witnessed violence directed at both colleagues and themselves, and attended hazardous scenes.

I remember one of the cases, it was an assault case and there were more than three big men fighting, using knives and sharp objects...for me, I felt at that time nervous…kept

thinking of how dangerous my work is… thinking of how risky is being, being on a scene where there is violence, blood, knives…felt, you know a bit anxious…Like, what would happen if I got trapped, injured, or killed during attending one of such cases? The thing is that I had difficulty sleeping for days, kept avoiding people, and I just wanted to be away for days from everyone. (PMED_M_0.3)

Another participant expressed worry after seeing a colleague get hit by a car while helping a vehicle accident victim in the middle of a highway. The participant also worried about the unavailability of immediate support for personnel who suffered work-related injuries.

…Seeing my [...] colleague at the ICU, made me feel that we are in danger and that our work is so risky. I mean, you know, everyone in the field is exposed to danger. There are colleagues of mine who had been exposed to physical violence by their patients. So, all of this made me think whether someone will be there to provide us with the needed support when we encounter such a danger. (EMT_M_0.5)

Similarly, another participant reported anxiety after working to rescue victims of a catastrophic fire in a tower. As claimed by this participant, the hazardous scene made them feel threatened.

Honestly, I was scared. I felt we were out of resources like equipment and medics, so we had to ask for additional help. I felt scared because we were also in danger. All of us were in danger. There was a huge fire, so the scene was hazardous for us. (EMT_M_0.6)

Emotional reactions

Gender differences emerged in participants' reporting, as female staff exhibited emotional reactions, such as feeling overwhelmed, helpless or anxious, more often than their male counterparts. One participant attributed the difference to women's generally empathetic nature, which is characterised by the ability to readily share others' pain and suffering.

Thinking about all that makes me realise how we – we as female paramedics – get attached to patients…we get emotional more than our male co-workers because we are more understanding of the patient's suffering and the suffering of their beloved ones. (EMT_F_0.4)

Feeling overwhelmed

Several participants reported feeling overwhelming emotions, particularly whenever they dealt with cases involving children. Moreover, participants associated being emotionally overwhelmed with identifiable situations and patients, such as if a patient reminded them of a close relative.

Female EMS staff reported that they would often approach critically injured children as they would their own, causing them to feel emotionally overwhelmed.

> *While on scene, I kinda felt emotionally overwhelmed, especially that the family and bystanders were shouting and…you know, when a patient is a child – for us, as females, we tend to be more affected. It really touched me...maybe also because I am a mother, and my children are my life…imagining my children in a situation like that for me is more like a nightmare.* (EMT_F_0.7)

> *The reason why that distressed me so much is because, unfortunately, we could not save the baby, and that, um, affected me personally, not only as being a woman but also as being a mother myself. I – I have three kids at home and just thinking about that…like, what if that was one of my children?* (EMT_F_0.4)

Anxiety

Participants also reported feeling anxiety while reflecting on the pain of the family members of deceased individuals. Such feelings persisted in cases of attempted suicide. One participant revealed that he was 'anxious for weeks' wondering why people resort to suicide instead of finding solutions to their problems, especially when they have a family. Because EMS workers are trained to help and save lives, self-harm cases conflict sharply with their inherent professional as well as personal ethos and values. This conflict can trigger prolonged anxiety.

> *I had managed to have a talk with the wife, and she mentioned that he was into some financial trouble, which might be the reason for his suicide attempt. Seeing the patient's wife and child crying constantly was not a good sight to see...No one should take their lives, irrespective of what they are going through...He should have thought once about them before taking such an action. I was anxious for weeks after that case, kept thinking about it day and night, you know, just thinking about his wife and child. I even tried to justify to myself that maybe he was going through something horrible, which is why he took such as an action. It's just horrible.* (EMT_M_16)

> *See, the thing with suicide cases, it makes you feel anxious – like, really anxious and nervous for days, sometimes for weeks – because you know that it's a preventable incident. You know that it's something within the control of humans, so why you gotta do that to yourself and your beloved ones? I don't get it – we save lives and then there are those who just throw themselves off the bridge. (EMT_M_0.5)*

Guilt

Nine participants admitted to feeling guilty whenever a patient died. They sometimes blamed themselves, thinking that perhaps they had not done their utmost to prevent the patient's death.

> *I kept remembering some details of the case and blaming myself for not being able to handle it well or do my best to save those patients.* (AP_M_0.2)

> *I blamed myself, had many bad thoughts. I felt bad that I wasn't able to help the patient, I wasn't able to save their lives – I felt like I was the cause of their death. I felt that I was the reason that the patient's parents were crying, I felt that I was responsible for what happened.* (EMT_F_0.4)

> *Deep inside me, I know that if I couldn't resuscitate their son, I'll have these feelings, that I'm a failure.* (EMT_F_0.7)

Such remorse persisted among EMS workers with fewer than ten years' work experience. EMS personnel with limited work experience had yet to develop a realistic outlook of critical incident outcomes and acknowledge the impossibility of being able to save all patients. Likewise, workers who joined the profession to help others and change lives positively often reported feeling guilty because each death constituted a 'failure' to achieve their primary ambitions.

Feeling helpless

The majority of participants reported strong feelings of helplessness during critical events. Feelings of helplessness correlated directly with increased post-traumatic stress symptoms. For example, one participant expressed helplessness when attending a severe car accident case. The mother survived, but all other family members had died on the scene.

> *…And you can imagine, the mom – how she was staring at me, waiting for an answer. And she had, like, her mouth full of words and questions, like, wondering, 'What happened to my daughter and husband?' And I could not easily answer her. I felt that there was nothing within my hands and that…I felt helpless and got nothing to do or say…they were dead on scene…I felt nothing was within my hands and that made more feel worse. I felt so tensed, and I remember having visions of that scene for almost three days.* (AP_F_0.1)

> *…But we were helpless here. The child would be struggling to cope with all difficulties related to her trauma. It is difficult to think about it, and seeing a dead body wasn't easy for me…that was my first time attending a serious motorbike accident.* (PMED_F_19)

Such feelings of helplessness persisted among EMS personnel, regardless of gender or overall length of work experience, nationality and job position.

Behavioural reactions

Typical behavioural reactions included decreased appetite, difficulty sleeping and feeling overprotective of loved ones out of the fear of losing them.

Decreased appetite

Decreased appetite, lasting days or weeks after a critical incident, was commonly reported.

> *It was overwhelming…you know, seeing that little girl losing her entire family…I only suffered from loss of appetite for probably one week.* (EMT_F_17)
>
> *I was sad and wanted to forget it, but it was not that easy, you know. You always return to such experiences. I was not eating well.* (PMED_F_19)

Difficulty sleeping

Some participants reported suffering from persistent insomnia and difficulty sleeping for days after a critical incident. The main reason was the inability to stop thinking about injured or deceased patients, triggering sleepless nights.

> *…And I even I got insomnia because I could not easily sleep without thinking about this patient.* (AP_F_0.1)
>
> *Thinking about it – as I said, for weeks, I had problems sleeping. Whenever I put my head on the pillow, thoughts of that child will come to my mind. I remember even my wife noticed that I'm not sleeping, sleeping enough, sleeping well. You know when – it's like you want to stop thinking about it all day, uh, but, yeah, before bed you'll think about it. (*EMT_M_18)

Overprotectiveness of loved ones due to the fear of losing them

Participants documented anxiety and worry about their family members, particularly children. This anxiety caused most participants to continually check up on their family members to confirm their safety. Furthermore, witnessing critical incidents involving children increased participants' anxiety.

> *Because it happened to a child from a good family. His parents loved and cared for him, but an accident made him suffer and left scars for the rest of his life. It made me feel unsafe too. I am a father, and my children might be damaged, although I love them and*

care for them… actually, after that call, I called at home to ensure that my kids are OK…As I told you, I was scared and tried to look for my kids more attentively. I think it was difficult for them [laughs]. (EMT_M_15)

The more I respond to calls like that one, the more I – I fear for the safety of my baby boy, because these accidents can happen to anyone, yeah? (PMED_F_19)

The realisation that accidents and other harmful circumstances can happen to anyone at any time constituted the main trigger for overprotective behaviour.

Subtheme 2.2: Effect on performance

Of the 20 participants, only four discussed the effect of post-traumatic stress reactions on performance. These participants pointed out that their negative reactions directly diminished their performance and the quality of care they could provide to victims and in subsequent cases.

You know, the thing is that having all these emotions and thoughts could, in fact, somehow affect how we deal with the next call – like how we treat the next patient…imagine feeling overwhelmed with all those emotions and then having to deal with another patient...you will feel more anxious, more overwhelmed, and all of this could negatively affect how you're dealing with that case. (EMT_M_16)

*…You don't want all those bad reactions to affect you, affect how would you respond to the next call, affect the way you manage the next patient…once you realise it's affecting you and affecting how you are dealing with a patient, you'll be more strained and more overwhelming feelings accumulate…which all, in a way, could affect your clinical management of that case. (*EMT_M_10)

In addition, it emerged that the negative emotions resulting from witnessing a traumatic incident led to impaired communication between EMS personnel that, in turn, worsened performance.

There was a miscommunication between us, the medics who are on the scene. We felt helpless and everything was so out of control at that time that we could not even do a proper triaging of the patients. (AP_M_0.2)

7.2.3 Theme 3: Preferred coping strategies

Several coping strategies emerged as participants reported their attempts to manage their stress from critical incidents (post-traumatic stress/reactions).

Subtheme 3.1: Cognitive emotion regulation strategies

Cognitive emotion regulation strategies include the avoidance coping style, positive refocusing, expressing emotions and acceptance.

Avoidance coping style

Participants reported using avoidance as a coping mechanism. They would avoid thinking about the critical event to control their reactions. Such participants reported developing other means of distracting themselves from thinking of the critical event, like going for a walk, playing video games or engaging more with their friends and family.

> *Going for a walk and listening to music, watching movies, uh, comedy movies. Sometimes I play mobile games...It helps to not think about it*. (EMT_M_12)

> *…I might also play video games and do some outdoor activities with my kids. A good way to switch and not think about it, to be honest.* (EMT_M_15)

Leisure activities such as sports also decreased their post-traumatic stress reactions and prevented participants from overthinking about the traumatic cases, even if only for a brief period of time.

> *…And the other stuff, like sports, are good for the short time, just to not let that kind of calls in your mind – like, distract yourself for some time, especially when you start to overthink. Also, going to the gym, it makes you forget for a while about whatever is stressing you and it also releases all the negativity within you.* (EMT_M_18)

Others, especially workers with more than six years' experience, preferred taking breaks for a few hours or taking entire days off to avoid thinking about a traumatic incident.

> *Having time off, like getting two days of emergency leave or even one day, if possible, just to stay away from whatever reminds you of that case.* (PMED_M_0.3)

Some participants reported avoiding the location of critical incidents to avert negative thoughts and feelings.

> *I even started avoiding – avoid going to certain areas that would remind me of that case.* (EMT_M_15)

Still, some participants reported that avoiding negative emotions did more harm than good. Participants reported that colleagues who adopted an avoiding coping style were more prone to develop negative emotional reactions that inadvertently lead to burnout. This notion was more

prevalent among female staff, who were more willing to acknowledge and express their feelings than male colleagues.

> *…to not ignore their emotions. Yes, I think they shouldn't try to avoid their emotions. Some people think doing this helps, but I believe it only accumulates and eventually leads to more struggle.* (EMT_F_14)

> *I believe that by doing so – I mean, by avoiding your feelings – you are bringing more harm than good to yourself, because all those unwanted feelings and thoughts keep storing in the back of your head, and one day you might just explode.* (EMT_F_17)

> *I know some of my colleagues who actually felt lost and avoided talking about their feelings, which ended up being in worse state of mind, I would say.* (AP_M_0.2)

The data indicates a higher prevalence of avoidance strategies in male EMTs versus female EMTs.

Positive refocusing

Six participants reported coping with post-traumatic stress by focusing on other positive aspects of their lives. According to these staff, exposure to distressing incidents gave them a positive frame of reference with which to view the world more optimistically. One participant revealed that strengthening his bond with his wife and children helped him deal with his emotional sequalae after witnessing a traumatic event.

> *I remember one of the things I used to do that was very helpful was strengthening my relationship with my wife and two kids. Yes, I've become closer to my family…I felt that I started to feel more connected to them. Maybe it's because I started to appreciate the blessings in my life, which, in return, helped me to avoid getting over-stressed with the negative aspects of being in this role. You know, it helps because you then start to understand that life is about the good and bad…whenever something bad happens, just remember that there are good things in your life – in this case, my loving family.* (EMT_M_0.5)

Another participant believed that directing thoughts to pleasant matters had decreased their negativity and enhanced their positive perspective on life. The participant indicated that this approach was helpful in alleviating their emotional reactions. They began to believe that everything in life happens for a reason, leading them to reach a stage of acceptance.

> *I started to believe it would be better to focus on the positive sides of life rather than the*

difficult things. I counted my blessings and, to be honest, that was helpful, because once you replace the negative bad thoughts with positive ones, you start to feel better, look better, act better and even view life differently. You start to believe that everything happens for a reason…you finally accept this, and understand that eventually things get better. (EMT_F_0.4)

Expressing emotions

Other participants emphasised the importance of sharing their emotions with their friends and family to manage the burden of negative emotions. Female and junior staff (with a tenure shorter than four years) showed the greatest willingness to express and share their feelings.

Of course, you will take this burden from yourself, and you will share it. (AP_F_0.1)

I know that speaking out about it is helpful for me, so I would go for it and let it out. (AP_M_0.2)

The majority of staff sought social support from their peers. Staff reported that sharing with peers (or, at least, with someone with a medical background) helped manage the emotional sequelae resulting from critical cases.

I talked to my older brother. He's a doctor working in a hospital in Sharjah. I usually talk to him whenever I need advice or a consultation. He's in the medical field and has over 10 years of experience. So, I feel good when talking to him because first he is my brother, we are close to each other, and because he is in healthcare – has a background in emergency care. So yeah, I felt relieved talking to someone who is close to me and understands what I'm talking about. (AP_M_20)

…I spoke to two medics in my shift, because they are the only ones who would understand the entire situation. (AP_F_0.1)

One participant reported that they sought to minimise the effect of the incident on their mental well-being by sharing their negative emotions with friends outside of work.

My friends came to boost my mood and made me feel better. They showed their support, I kept venting out and it felt like removing a heavy burden off my chest. (EMT_F_17)

Overall, this subtheme concerns participants' strategies to lessen their emotional burden by sharing negative feelings with colleagues, friends and family members. Doing so helped participants to feel relieved and better manage their reactions following a critical incident.

Acceptance

Numerous participants reported employing acceptance as a strategy to cope with the impact of critical incidents. They acknowledged the role of fate and the value of 'letting go'. Some participants emphasised the belief that everything happens for a reason, whereas others had learnt to accept that some things are often out of their control. Shifting their focus to things that they could control was more beneficial, according to such participants. The latter acceptance approach was more prevalent among Muslim Arab staff (Emirati and Jordanian) and senior staff (with more than 6 years of experience).

> *I accepted that such things happen in life, and we can do nothing to do with it.* (PMED_F_19)

> *I felt that you have to accept that there are certain things that you cannot control in your life. So, yeah, I accepted that. (*EMT_M_16)

Participants documented better mental health outcomes after accepting that negative emotions are a normal part of their work. EMS personnel used acceptance as a coping strategy to make sense of traumatic situations and recognise that they cannot control all outcomes. Senior staff reported being more likely to process events with such clarity to avoid feeling stuck in a loop of negative thoughts.

In addition, faith-based and spiritual coping techniques were found to be more prevalent in participants connected to Arab culture, perhaps due to the association between Islamic culture and beliefs about fate. Muslim Arabs believe that whatever happens in life is controlled by God, who holds supreme power over the universe. Islam teaches that human beings should have faith in their fate, whether good or bad, because everything happens for a reason (Arab Academy, 2017). There were some non-Arab Christian staff who also adopted a faith-based coping technique. This could be because Christianity, too, teaches its adherents to put their faith in God (Norenzayan and Lee, 2010).

Subtheme 3.2: Religious coping strategies

Many participants reported relying on religion to cope with stressful life events. Religion enabled them to reconcile with human suffering, control their emotions, help others through pain and solve problems. These participants reported that their mental burden became manageable when they applied religious principles, such as strengthening their faith and their connection to God.

Numerous comments evinced the use of faith-based and spiritual coping strategies.

> *You should have faith on* [sic] *whatever happens to you and believe that this is only for a temporary time, as it won't last forever.* (AP_M_0.2)

> *Honestly, getting more religious was helpful. Doing my five prayers as a way to communicate with God and release the tension…after all, we gotta have faith that everything in life happens according to fate. Everything is destined by God. So why bother? Why [be] overloaded over things we cannot change?* (EMT_M_0.5)

> *In my religion as a Christian that God is sovereign, and our lives is* [sic] *in his control. So, for me, I will pray and try to connect my soul more to God. (*EMT_M_0.6)

Faith-based and spiritual coping techniques prevailed among individuals from both the Islamic and Christian religions. Additionally, staff who experienced frequent symptoms of post-traumatic stress (e.g. nightmares, flashbacks, intrusive thoughts) were more likely to turn to religion to understand the meaning of suffering. The length of work experience did not appear to have a mediating effect on religious coping strategies.

Subtheme 3.3: The use of humour

Three male participants reported coping with critical incident stress through laughing. Humour functioned as a distraction and as a method to mitigate the impact of the traumatic incident.

> *Sometimes we use humour as a way to distract ourselves from the concerns and negative thoughts.* (AP_M_0.2)

> *We always use humour as a way to feel less emotional. Even whenever we think about what happened – I mean that accident –, we all tryna* [sic] *not take it seriously and keep laughing about it. For me, I usually feel that making jokes is a way to avoid getting emotional. (EMT_M_0.5)*

7.2.4 Theme 4: Experiences of professional support

A consensus was reached regarding the importance of professional mental health support, although participants' individual experiences differed. Participants alternately reported experiencing a lack of support, unhelpful support and helpful support from their employers.

Subtheme 4.1: Lack of professional support

Some participants reported that their employers did not provide formal mental health support to them in the aftermath of a critical incident. Such participants agreed that top management should offer mental health support to EMS workers after handling critical cases.

> *To be honest, I am not aware of any means of support provided within the service.* (PMED_M_0.3)
>
> *No, never, to be honest. I do not think we have such options.* (PMED_F_19)
>
> *To be honest, there is nothing official right now within the organisation.* (EMT_M_18)

Subtheme 4.2: Helpful professional support

An interesting finding emerged whereby official debriefings focused on the procedural aspects of critical events, rather than the psychological aspects. Staff indicated that supervisors who conducted debriefings would concentrate on technical issues to identify and address procedural defects, avoiding discussion of feelings and emotions.

> *He usually carries out a debriefing after each MCI – like, we gather all of us who attended the MCI and discuss what could we have done better next time…like, going through the procedures and stuff like these.* (EMT_M_0.6)

Although such debriefings did not involve expressing emotions or thoughts, a number of participants found them to be effective in mitigating their reactions to a traumatic incident. Such participants use a debriefing as a way to avoid thinking about the incident. This was commonly reported among those who preferred coping methods of avoidance over acceptance, applauding debriefings that focused on technical issues.

> *I think these meetings are good. They make us connect with each other…we keep talking and discussing matters related to patient care management…well, I personally don't feel comfortable talking about my emotions. I prefer avoiding such talks...So, yeah, these meetings were helpful in terms of avoiding certain emotions that come with that difficult call and simply focus on the delivery of emergency care. (*AP_M_20)
>
> *We have the chance to discuss the questions we have at the moment. So, for example, after that third-degree burn case, we gathered after three hours and conducted a debriefing meeting for about an hour, it was good to discuss about the case with our supervisor…you distract yourself from being vulnerable and emotional. I believe it helps*

in that sense. (EMT_M_15)

Moreover, when participants were asked whether they would prefer these debriefings to involve a discussion of emotions, they emphasised that avoiding talking about their emotions was preferable, because a debriefing was not the proper time to 'open up' about their feelings. According to these respondents, they needed more time to process their feelings.

> *I don't think at that time I will be able to talk about it...too soon for me. I would rather wait to open up about it. Maybe wait for a week, at least, and then I will be in a better position to open up about my feelings.* (EMT_M_0.6)

> *Although I feel that it would be better to be carried out days or weeks after the major accident, you know, because sometimes you are not ready to talk about stuff related to that incident, like on the same day…you just need some time to process that case and then talk about your feelings when you are ready.* (EMT_M_16)

Still, two female workers reported that the regular debriefings carried out by their supervisors after critical cases did allow for the expression of emotions. They indicated that they had an opportunity to share their thoughts and relieve stress.

> *Yes, usually after mass casualty incidents, we meet and speak about the mass incident and get the chance to talk about what made us stressed. We bring [up] lots of topics in these meetings…It depends on how I feel at that time. If I have a lot to share, I do not hesitate to open up and speak up my mind. I will talk about my feelings, yes…and it such a relief when you share with others.* (EMT_F_14)

Subtheme 4.3: Unhelpful professional support

Although some respondents found the debriefings carried out by their supervisors to be helpful, the majority reported otherwise. To them, these debriefings were unhelpful because they did not address staff members' psychological needs or allow them to express their emotions effectively. Female and junior staff (those with five years of work experience or less) were the most enthusiastic about psychological debriefings and reported needing space to discuss their feelings in these settings.

> *I think it is important to add some psychological type of discussions, because sometimes, you just need to let them know how you are feeling after that case. You want them to understand you, and know what you are going through and what's in your mind.* (PMED_F_19)

> *I think these debriefing sessions will be handy, if we were allowed to vent out, talk and let out our thoughts and emotions.* (EMT_F_0.7)

> *They focus on technical things while we try to express our feelings. That's why it's better to focus on doing things you enjoy doing, like listening to your favourite songs, dancing and whatever you enjoy doing.* (AP_F_0.1)

Some participants believed that attending debriefings worsened EMS workers' mental health outcomes. These participants indicated that, because these debriefings tended to focus on the technical aspects rather than the cognitive and emotional aspects, supervisors would highlight mistakes made by staff in their clinical management of the scene. According to participants, top management should instead recognise that frontline staff are human beings with a natural propensity to make mistakes.

> *There shall be people who understand that we are humans. I mean, come on – no one is perfect, and we all are prone to making mistakes, but do not only focus on the mistakes we do…this make us feel worse and more stressed*. *Sometimes they forget that we also make – at risk of making errors, you know, and that puts us under more stress.* (EMT_M_0.5)

A consensus emerged regarding debriefing timelines. Most participants agreed that supervisors should not conduct debriefings immediately after critical incidents; this is the time when people are more likely to experience an 'emotional outburst'. Instead, debriefings should occur the following day, when emotions are more likely to be under control.

> *It is like when [we] just came back from the call, and we just needed some time to rest instead of bringing back the whole scenario of the call. Maybe these types of debriefings need to be done next day – not hours, you know – like, not immediately after the call, when you feel that you are in a mess and having an emotional outburst. Plus, at that time I felt I don't know what to say except waiting for the debriefing to finish and have some rest.* (EMT_M_11)

Subtheme 4.4: Perceived barriers to seeking professional mental health support

Expecting an unsupportive response from supervisors

Some participants reported expecting supervisors not to provide mental health support, so they would not ask them for it. Compared to Arab personnel, non-Arab EMS staff more frequently reported such low expectations concerning supervisors' willingness to offer mental health support.

To be honest, uh, I do not feel comfortable talking to my supervisor about my feelings…well, I don't think they will do something about it, so why bother? (EMT_F_0.7)

Participants also reported believing that supervisors' roles, characterised by busy schedules and excessive responsibilities, did not leave any time for them to listen to workers – much less deal with their feelings, thoughts and experiences following critical incidents. These opinions were common among both Arab and non-Arab personnel.

Well, but if you think about it, these supervisors do not have sufficient time to talk and sit with every paramedic after every difficult case. (AP_M_0.2)

She is busy most of the time, and I can understand that. Supervisors have many responsibilities, and they deal with a lot of issues. (PMED_F_19)

I think supervisors are always busy and cannot be patient with such things because, uh, there are lots of units, lots of medics, you know, lots of tasks they have. I simply don't think he will be willing to give a listening ear. (EMT_M_12)

Some participants considered their supervisors unapproachable and reported being made to feel that there was no time to discuss such matters. This perception of supervisors' unapproachability fostered negative attitudes against seeking support. The perception of dismissive attitudes also led participants to believe that their supervisors would be incapable of holding meaningful discussions with frontline workers.

Some maybe will always tend to let you feel that they are busy and have no time for that. (EMT_M_11)

The thing is that some shift in-charges make you feel that they are busy all the time and have lots of tasks. You can't simply go and tell them you wanna talk about that difficult case; they have other, bigger things to deal with. (EMT_M_0.9)

Participants who reported a lack of professional support were asked why they remained passive instead of engaging their employer to provide mental health services. Respondents' answers reflected low expectations towards their organisations. Expecting less from their employers prevented workers from asking for professional mental health support.

It is just – I'm not expecting that there are support for such matters within the organisation. (EMT_M_11)

I honestly don't know…maybe because I didn't expect to have one. (EMT_F_0.8)

Fear of misjudgement

The fear of being judged as weak brought about a remarkable reluctance to seek professional mental health support. Participants were afraid that they would be labelled 'not well fit', which would stunt their career progress. Regardless of gender, Jordanian, Filipino and Indian employees reported worrying about such negative labels, but Emirati employees did not.

> *I also think that I might get judged by my supervisor if I share such emotions and feeling* [sic]. (EMT_M_16)

> *Because once you admit you need help, then you admit that you are struggling…and thereby, others will see your – your weakness points.* (EMT_M_0.9)

> *The thing is that we do not want our career to be affected in any way. We do not want to be labelled as 'weak' or as someone who could not handle his job well…What if those who sought help will not get promoted because they are seen as not well fit for that position?* (EMT_M_0.5)

This fear led EMS personnel to avoid any actions that could eventually affect their chances of promotion. They reported having little trust that their employers would refrain from holding any negative reactions against workers during their annual evaluations.

> *Risky for our evaluation, uh, end-of-year evaluation, and maybe later our promotion, because managers will promote, uh, maybe those who are resilient and not showing that they struggle.* (EMT_M_12)

Although fear of misjudgement was reported to be more predominant among male staff than female staff, one female worker reported that she feared being judged for expressing her emotions simply because of her gender.

> *Knowing that my manager or shift in-charge would not think of me and judge me as a weak or overly sensitive person, just because I'm female, you know.* (EMT_F_14)

Although some participants did not actively request time off following a critical incident, all participants agreed that time off would help them cope with post-traumatic reactions. The main reason for not taking time off was fear of negative responses from supervisors. Some worried that their supervisors would view them as weak and incompetent. Such fears were reportedly more common among male personnel than female personnel, especially men with work experience of 10 years or more.

But from me, I never requested, maybe because I don't want my supervisor to feel that I'm having problems with my work responsibilities or that I'm incompetent to handle difficult calls. You know, maybe he will think that I'm being vulnerable. Actually, supervisors should be the ones offering some time off. (EMT_M_13)

Mental health stigma

Participants often held back from expressing their post-traumatic stress due to prohibitive cultural practices and beliefs. For example, most Arab cultures discourage men from freely expressing their emotions, especially if the feelings involve mental distress, which is considered a form of weakness. The prevailing belief in such cultures is that men ought to be strong enough to brave life's hardships. Arab men are expected to keep their vulnerabilities a secret. Thus, male workers reported experiencing greater difficulty and unwillingness to share their emotions or seek professional mental health services than women.

The culture of the Arab, like, more reserved and, uh…yeah, like men should – should not express their struggles in general. (EMT_M_0.6)

This is also related to culture if you think about it… like our culture, male [sic] *are the savers and who – who take care of others, and emotions are more, like, female thingy* [sic]. (AP_F_0.1)

Workers from other nations were also subject to obstructive cultural practices and values. Participants pointed out that foreign national staff were also affected by the social norms of the country they were living or working in, as they started to adopt the norms of Arab culture in the UAE (the culture of their country of residence). Others stated that, similar to Arab countries, their countries of origin also expected men to be strong and aggressive and to refrain from openly discussing emotional vulnerability. Male workers generally masked their emotional reactions to avoid contradicting such cultural expectations.

If a person works here, it is impossible to remain distant. I mean, you start thinking similar to others. Actually, there are certain beliefs that are also common in our culture back home…like the idea that men must protect and safeguard their family…emotions are for women, because they are emotional by nature, these beliefs also exist here. (EMT_M_15)

Even people from other nationalities hold the same view, meaning they are influenced by dominant values here. (EMT_M_10)

I believe because they have been here in that country for a while. You know, when you

get the country norms, maybe it's something like this. (EMT_M_11)

Additionally, some participants highlighted the difficulty of expressing their needs in seeking mental health help because of the difficulty of challenging long-standing cultural ideas, attitudes and practices.

> *It's hard to change people's attitudes on how they view mental health, and – and just convince them to, for example, uh, seek that specific help.* (EMT_F_0.4)

Gender stereotyping was also reported to be prominent, based on the perception and generalisation that female EMS professionals should seek help more frequently and freely than male professionals, because women are ostensibly more emotional and vocal than men.

> *I think my male colleagues tend to avoid talking about this stuff…it is like shameful to discuss such things…so probably maybe us, female medics will prefer going to a professional therapist and disclose such things.* (EMT_F_0.7)

> *Maybe female staff, as they are more willing to express and talk about their feelings with others.* (AP_M_20)

Organisational cultures also played a critical role in participants' decisions to seek professional mental health support. Most participants characterised their organisational culture as masculine, exemplifying traits such as physical and mental strength, competitiveness and assertiveness. As a result, workers resisted mental health support services in order to avoid contradicting popular beliefs within the organisation. Numerous participants voiced the negative impact of masculine organisational cultures, regardless of gender and nationality differences.

> *...If you noticed, this is something common in such services, where you need to save others' lives. There is this – the sense of taking full responsibility of others and not showing that you are pressured or having some difficulties.* (AP_M_0.2)

> *Maybe because of masculinity issues* [laughs]. *You know, everyone thinks that men should always be strong, and emotions are not for them. Probably this is something common in emergency rescue services.* (PMED_F_19)

7.2.5 Theme 5: Experiences of informal support

This theme concerned workers' experiences of informal support based on four subthemes: supervisor support, peer support, support from friends and family, and self-help methods.

Subtheme 5.1: Supervisor support

Most staff reported that having a supportive supervisor enabled them to seek help. Fundamental traits of supportive supervisors included being approachable, listening actively and providing time off when possible. Participants also reported believing that supervisors should exhibit sympathy and compassion for workers undergoing traumatic events. According to frontline staff, supervisors are their primary 'link' to top management.

> *You know... the supervisors are the link between us and the CEO...they should be the ones who deliver our needs and struggles to the higher authority.* (EMT_F_0.7)

> *Like, show us that you care – supervisors should be more caring and be willing to listen to us…they are the link to the upper management. (*AP_F_0.1)

> *I think it all depends on supervisors; they are the key to accessing support. If they are approachable and compassionate, then medics will be open to ask[ing] for support. This will, I believe, have good results, because medics will not need to accumulate their struggles and stress…they will approach their supervisors whenever needed.* (EMT_M_15)

> *Some supervisors would take some time to meet the staff after the incident to talk about it*; *sometimes they even offer time off without asking for it, and I think this is crucial to have an approachable supervisor.* (AP_M_0.2)

Some participants reported that having a supportive supervisor promotes a sense of unity and belonging across the shift, which helps to reduce their negative reactions to traumatic events.

> *There are some good supervisors who work hard to create an environment where everyone feels, having a feeling of unity…I think we as medics try to keep our circle tight – I mean, like, supporting each other. And, you know, this is something I believe is so, so important in our field, because it's a way to reduce the bad effects of that call…after all, we spend more time with each other than with our family.* (EMT_M_0.6)

Some staff also stressed supervisors' role in facilitating top-down support. These respondents pointed out that supportive supervisors encouraged staff to seek proper mental health support.

> *It all starts from the top. If you want medics to seek support, you must make them comfortable and confident to express their feelings and ideas…this will make them trust*

their supervisors and – and ask them for help, for guidance. (EMT_M_0.5)

A person can seek the type of support which he or she believes is best for him or her. They know what is best for them…Supervisors can also encourage this behaviour or disregard it. So, it depends on a person, for sure, and also on the supervisor. (EMT_M_10)

Subtheme 5.2: Peer support

Participants agreed that peers were critical in ensuring equitable access to mental health support services. Respondents were more likely to seek help from peers than from supervisors, relatives or friends outside of work. The underlying principle was that peers had suffered similar experiences and could therefore better understand and support one other. Also, peers were more likely to trust and confide in one another than in supervisors.

It is important to talk about it with your colleagues who are with you in the field. I think that this helps...it reduces the bad feelings related to the case – I mean, even if these colleagues did not attend the same case with me, they are still experienced with what I am talking about and would understand me. (PMED_M_0.3)

He knows what I am talking about, which makes it easier for me to say the story and not be misunderstood. (EMT_M_11)

More benefits of peer-to-peer support included creating a sense of belonging and unity among staff. Unity enhanced the overall sense of security because staff members understood that they could rely on one another to overcome job hardships. Colleagues could influence one another's decisions and attitudes to boost positive mental health help-seeking behaviour, according to participants.

It is fundamental for our work. I mean…we always work together; results depend on our cooperation. It makes us feel safe because we know that at the end of the day, we are there for each other. That is why it is impossible to disregard the power of support provided by equals. We should try to monitor our peers' states to be ready to provide additional support and ensure they can cope with difficult situations. For this reason, I believe that it's vital to create friendly relations within a collective and ensure every member is ready to support a person who needs help. (EMT_F_0.8)

We tend to either encourage or disappoint each other because here we are more like a

tie knot [sic] *family. If someone is, for example, attended or asked for that support and told us that it was useful and helpful, then it affects how other staff in the field would see that support*. (EMT_M_11)

Participants also highlighted the notion that senior colleagues play a vital role in promoting workers' mental health outcomes. Findings revealed that experienced workers would offer practical advice and support to junior colleagues experiencing emotional distress. The resulting mentor–mentee relationships enabled less-experienced workers to better cope with distressing cases. Furthermore, it was found that EMS workers with negative attitudes towards seeking mental health support could become more receptive to professional mental health help if their senior colleagues used these services themselves. Non-Arab employees, in particular, demonstrated this predisposition to rely on more experienced senior staff for mental support.

Start with senior paramedics. They can be a good example…because we trust them, we ask them for guidance and support…this might attract others, even those who don't usually look for a support. (EMT_F_0.8)

One of my colleagues, who's been there for a longer time, told me how to cope and that is to not – to disconnect from the situation, to remember that we try our best to help patients. (EMT_F_0.4)

We try to support each other because of working in teams. From my experience, I remember being supported by others when I started to work here. Now, I try to support newcomers and share my experience. (EMT_M_13)

I usually talk about work difficulties in general with two paramedics, who are my seniors. They sometimes give me suggestions and helpful tips...It helps, because talking to them gives you insights on how to better manage all that distress. (PMED_F_19)

…When talking to them, you, like, realise that it's normal and nothing is wrong with you…and then later you realise that you are not the only one dealing with this...even those with longer experience in the field sometimes deal with such struggles…thus, it's important to make everyone understand that. (EMT_M_12)

Frontline staff reported that peer-to-peer support within small groups facilitated social sharing of emotions and meaningful discussions around critical events. In these settings, participants could effectively manage their stress and adverse reactions. These small groups also benefited

individuals who could not fully articulate their feelings on their own, but who were aided by hearing their colleagues express similar feelings and reactions.

> *If I'm incapable of describing how I feel in words, groups might be helpful for me by just listening to my colleagues' experiences.* (EMT_F_14)

> *I think it is better to have such meetings in small groups – like, not more than three to four medics. It will make you feel more confident, by realising that you're supported by others, and this is important for me. But honestly, I don't like it when these meetings are conducted in large groups and with people from other shifts or other departments.* (EMT_M_15)

Most respondents reported that their co-workers understood, validated and supported their peers. They indicated that such compassionate social support decreased concerns associated with seeking mental health support. Participants reported a belief that peer support would increase staff's willingness to seek and advocate for mental health support.

> *…They are your people. They understand you and make some effort to listen, because they've been in that situation…They can also encourage you to ask for professional assistance, and it will be OK. You will feel that it is something normal, because they will make you feel that it's OK to talk about that difficult call and express yourself.* (EMT_M_13)

One participant highlighted the importance of peer-to-peer support in recognising those who need help. This participant stated that colleagues had direct contact with one another and could tell whether a co-worker needed mental health support after encountering a distressing case. In this way, workers looked out for one another and extended timely help as the need arose.

> *If, for example, a medic felt down after a red call* [critical case], *you will see his assigned partner and teammates are the ones who notice that, not his supervisor nor his wife…his team will be the first to realise that and will ask him, try to talk to him or at least listen to him. So, in my opinion it's very important, because if you think about it, it's like the first step to knowing and realising that someone is down and needs support.* (EMT_M_18)

The state of being away from one's home country correlated positively with seeking support from peers. Non-national staff deliberately cultivated connections with colleagues and depended on these peers to cope with emotional stress following distressing cases. Compared to native-born Emiratis, foreigners exhibited a stronger need to form close interpersonal relationships with co-workers, perhaps to compensate for the lack of connections with their families in their home countries.

Those staff who are away from their family, you know, like, they feel that peer support is so important for them. (AP_F_0.1)

…Especially when you are single and away from your relatives, you need your friends at work – your colleagues who can understand you and be there for you. (EMT_M_13)

…Some of us are even far from their family, like, some medics don't have their families here. These medics struggled at the beginning because they wanted to have close people whom they can trust and freely talk to. (EMT_M_0.6)

Subtheme 5.3: Family and friends

Although most of the frontline staff reported seeking support from peers, there were some EMS workers who depended on social support from their family and friends. Spouses provided the most beneficial support, alongside close friends, in enabling respondents to manage post-traumatic stress reactions. Participants reported receiving social support in different ways. For instance, some reported verbally expressing their emotions to trusted family members and friends, while others would simply choose to spend more time with them instead of revealing their feelings and thoughts about critical incidents. Furthermore, female paramedics more frequently reported relying on friends and family for social support than male paramedics. This gender difference was attributed to the stereotype that men should not share their emotions.

I talked to my wife. Having emotional support from my wife made me feel way better. (EMT_M_13)

I figured out that sometimes talking to my close friends outside the workplace and just let it all out was something I needed to do…this helped me to release the stress from that distressing case. (PMED_M_0.3)

I think having a time off after a red case somehow helps. Because for me, when I'm having troubles after treating a critical patient, I'd rather go home and spend time with my children, my lovely small family. At moments like these, I just want to appreciate the good things in life. For me, I always found this to be helpful, as it makes your worries shrink, even if it's for a short period of time. (EMT_M_15)

Subtheme 5.3: Self-help

Some participants reported reading self-help books, accessing online counselling services with therapists and searching online for materials describing appropriate techniques for managing

post-traumatic reactions. These techniques were most commonly adopted by staff with working experience of 10 years or less.

> *I also tried to read self-help books…to read about psychology. You know, I wanted to understand what I went through after that call…to understand what might help.* (AP_F_0.1)

> *I have used a programme called Better Help and – and I've talked to one of the counsellors there…and that was really helpful in making me feel better, making me understand the situation…understanding that it is not within my capabilities to be able to save every single person that is in trouble.* (EMT_F_0.4)

> *Also, I read in one of the websites about that, there was a suggestion to write down details about the upsetting experience and all the related feelings on a piece of paper. I would say [I] felt relieved a bit.* (EMT_F_17)

One participant indicated that these self-help techniques allowed them to understand and make sense of the critical incident and their subsequent reaction, which helped them to reach a point of acceptance.

> *I kept reading…I felt the need to understand my thoughts…to go through my feelings, to understand why I kept being anxious and irritated all the time after treating that patient. I wanted to make sense of everything I was going through, so that I could simply accept it and let it go.* (EMT_M_13)

7.2.6 Theme 6: Interviewees' suggested interventions and strategies

Participants suggested various interventions and strategies for enhancing EMS personnel's well-being and mental health outcomes.

Subtheme 6.1: Providing formal downtime

Discussions and questions about possible interventions generated great interest among participants. Many emphasised the need for time off following critical incidents. Providing time off has been recommended by staff as an essential strategy that should be adopted by the organisation’s management. Some participants suggested a short break (between 30 minutes and two hours) or even a full day off after responding to a critical case. They reported that a break would help alleviate their emotional sequelae and restore their energy, giving them the strength to proceed to other calls.

> *…Sometimes it's difficult and more stressing when you respond to a call immediately after*

finishing from a serious call, especially when you start to experience all those emotions. (AP_F_0.1)

You might need one hour – I don't know, maybe you might need one day. But even 30 minutes' break is a good idea. Sometimes you need a break from responding to another serious call…it's hard when you respond to a red call and then immediately respond to another serious red call…you just feel burned out, because you didn't have enough time to process your thoughts and feelings between the two calls. (EMT_F_0.8)

As I said, half an hour to one hour will be enough in most cases. However, if someone is badly affected – like in a shock state, for example – it is possible to give the full day to recover, or ask if other additional help is needed. Otherwise, we will fail to function effectively. We need some time to be alone and refresh (PMED_F_19)

I think a supervisor should give you at least one–two hours to recover. I mean…supervisors should know it better as they have tools to manage such situations. They shall talk to you and ask you, like, if you need some time to rest…it will help. It…sometimes, even a day off is needed, as it'll help to get rid of all negative emotions affecting you from that incident (EMT_M_13)

Some participants indicated that having time off from service could help them to better cope with the aftermath of critical incidents. According to these participants, having time off helps by allowing staff to engage in simple, pleasurable activities, such as expressing their emotions to their colleagues, taking walks and chatting with family.

Little breaks might help to do it...at least half an hour to one hour might help. You will refresh before a new case, and the difficulties you are experiencing from that case could be minimised, because you had time to absorb what happened…For this reason, such breaks are critical. They will help to refresh, clear your mind, and maybe get the chance – get the time to talk to someone about what was so stressful during attending that upsetting call, you get me? (PMED_F_19)

I think it is possible to offer some time to recover after the most complex or stressful cases – like, you know, to refresh and gather your thoughts. It is good to know you have some time after such calls…Sometimes you just need a break, to go for a walk or maybe talk to your relatives, chat with your kids…you need to switch for a bit. (EMT_M_13)

Three participants reported that they had already requested time off after dealing with critical

incidents. According to these participants, the break provided an opportunity to process their emotions. Afterwards, they handled subsequent calls with a greater level of emotional stability.

> *She's a good supervisor, to be honest…She even was decent enough to give me the permission to take a few days off whenever needed…I think that break was enough to feel able to perform again without relapses. Taking a break just helps in not dealing with distressing red cases back-to-back…imagine having another severe trauma case after it, it would just mess with my mind.* (EMT_F_17)

Subtheme 6.2: Professional counselling

Several participants reported a preference for seeking mental health support from experts who could provide trusted professional counselling services. A significant number highlighted the importance of contacting a knowledgeable expert who could provide them with the necessary mental health support.

> *But sometimes you might need a special help, like talking to an expert who knows what's needed to be done to help you recover…Well, having some counselling would be great, I am sure. It will help to ease the distress.* (PMED_F_19)

> *It would be better to have someone who is a specialist in mental health, who could also be available whenever we need help after dealing with stressful cases...someone who is reliable and has the knowledge in this matter.* (AP_M_0.2)

> *Well, I think management should consider the availability of a psychologist in our organisation, or something like a counselling service. This would be ideal, because then there are professionals who their* [sic] *job is to support you. As I say, they will not judge you, or make you feel bad for asking for help – they are just there for you…to help you to go through your chaos, to go through your messy emotions…and help you to overcome the bad experience that you confronted.* (AP_F_0.1)

Online counselling

The majority of participants reported feeling more comfortable in online settings than in face-to-face sessions. EMS workers with 10 years' experience or less (typically the younger generation) were more inclined to use online counselling. Online support was reportedly seen as more acceptable and convenient than in-person counselling for this cohort because of the privacy it affords.

> *Because if you have to attend face-to-face sessions with a counsellor, the issue is that*

> *you might meet other employees; therefore, it would rise* [sic] *some questions…so doing it online could provide more privacy for the staff…as I mentioned before, making it online or through an app is something useful for us, especially with our shift work. Also, I talked about privacy and how it's important for the staff.* (EMT_M_11)

In addition, some participants indicated that online access appeared to be a more practical strategy, given their long shift work. Online services fit more easily into their schedules, allowing staff to spend more time with their friends and families on their days off.

> *Plus, I think people nowadays are looking for the easy access methods…online is better, if it's free and available for everyone.* (EMT_M_15)

> *… Like, start bringing professionals who are specialised and expert in dealing with EMS-work-related stress. They also should start encouraging the staff to seek assistance for their health if needed. It's important also to do things that will make it easy for them to reach for that help, like providing it online, carrying out online sessions…sometimes, as you know, it's hard for us during our off days – you need to spend more time with your family in your off days and, yeah, so online would save time…Maybe even running these sessions through an app, like an online app, could make things easy, and for us, because we work in long shifts, uh, sometimes we feel like we don't have time to go to face-to-face meetings or sessions*. (EMT_M_18)

Face-to-face counselling

A few participants reported opting for in-person therapy, rather than online counselling. Different motives informed participants' preferences. Those who preferred in-person therapy expressed the belief that online sessions could not replace direct human connection. They needed to physically relate with therapists to work through their experiences. According to these participants, in-person sessions allowed them to build a greater rapport with their therapists, which enabled them to share their deepest feelings, fears and sensitive information and, in turn, receive the vital support they needed. This was more commonly reported among participants who were 45 years old or older.

> *As far as I know, we can resolve emotional distress more efficiently by building a safe human connection. I don't think having an online counselling will be helpful. I want to have a direct contact with the person who is helping me.* (EMT_F_14)

The cultural background of mental health professionals also mattered. Participants reported that

having a similar cultural background with their therapist would enhance communication and support a shared understanding of the issues at hand. Respondents also reported that it would be easier to build an effective patient–therapist relationship, because participants could share information more comfortably with therapists from cultures similar to their own. Participants rated such support as being more beneficial in the long run.

> *I would prefer to talk to someone who shares with me the same cultural background, because things would be clearer to them. I believe it is better to have someone knowing your norms and values; it makes it easier for you to be opened* [sic] *about your feelings and thoughts.* (AP_M_20)

Participants reported opting for external therapy sessions conducted away from the organisation in order to avoid judgemental remarks. This cohort demonstrated a preference for external counselling so that their fellow team members would not learn about their need for therapy, thereby safeguarding their privacy and protecting them from misinformed stereotypes and judgement.

> *Some of the medics might be ashamed or afraid to approach the counsellor if they knew that it's inside the organisation. The managers and other admin workers might take that the wrong way – like, in a negative way – that these medics might be weak and not capable to do their job properly.* (EMT_M_0.6)

> *Well, it will be safer, I think, to have an external counselling service. We can discuss difficult issues with people not from our environment more willingly, I guess. It will add some confidentiality…and minimise risks. No one wants to ruin relations within a collective…so, yeah, having these sessions externally [is] better.* (EMT_M_13)

Participants reported varying preferences for group and individual counselling. A significant proportion favoured individual therapy, while others chose group therapy. The latter group asserted the importance of attending therapy with people they knew and trusted, whereas confidentiality and privacy were the main concerns for those who opted for individual sessions. For these respondents, sharing their feelings with others in a group setting would be uncomfortable.

> *Doing them individually [is] better, because I think there are some issues that will be better, more convenient to say when you're by yourself with the counsellor.* (AP_F_0.1)

> *Individually, of course, so that staff can be comfortable discussing sensitive matters.*

(EMT_F_0.8)

Both, I think…Sometimes people can help you to express your thoughts, while sometimes, privacy might be needed. But usually, I would prefer doing it individually; more privacy is better. (EMT_M_0.9)

Various benefits of group therapy emerged from the interview sessions. Participants reported that group counselling advocates desired validation and solidarity from their peers. Such benefits were difficult to achieve in individual therapy sessions.

I would prefer it to be conducted in a small group…like those who attended the call with you…It will make you feel supported and realise that you are not alone and improve your relationship with your peers. (EMT_M_13)

For me, it is better to discuss it in small groups – I mean, with people whom you trust. It's good to be surrounded by those who can also encourage you to share your thoughts and feelings…listening to others help you to talk and vent out your worries…but the circle shall only include people who you know…I mean, if I don't know a person, it can be difficult to discuss complex things. (EMT_M_10)

Moreover, participants indicated that all EMS staff should have sufficient access to counselling instead of focusing only on those who are 'frail' or experiencing post-traumatic stress symptoms. In their opinion, being able to access these services whenever the need arose would prevent post-traumatic stress from accumulating over time. Furthermore, these respondents reported that therapy sessions should be scheduled regularly and made mandatory in order to ensure attendance. This would help to normalise seeking mental health support.

When presenting something for the staff, it should be presented in a way that doesn't seem to be dedicated to the staff who are lacking resiliency…it should be dedicated to all staff. (EMT_F_0.7)

Maybe to let that service [be] mandatory for everyone...for example, if the organisation offered a monthly counselling for all medics, then no one will feel that he was targeted or unsecured…it is like a service that is offered to everyone on a regular basis. (EMT_M_0.5)

It should be something routinely [sic]*, for everyone, so that staff will feel normal about it and seek it regularly…maybe it would help you with whatever you're facing, and prevent it from getting worse.* (PMED_M_0.3)

Mental health professionals with an EMS background

Whether they provide face-to-face or online counselling, mental health professionals with a similar background in EMS were reportedly favoured by all participants because they could better understand their experiences and reactions. Respondents suggested that a professional with similar EMS experience would understand their post-traumatic responses and thereby offer the compassionate and informed assistance necessary for them to overcome their adverse reactions to traumatic events. Respondents indicated a belief that professionals who shared the same medical background would be more empathetic, because they would understand the everyday challenges experienced by EMS personnel.

> *I believe that it is important to have a specialist who understands trauma, EMS and psychology...something like this I would say would be good…especially, we will be able to trust that this person has the right knowledge and understands what we are going through.* (PMED_M_0.3)

> *I would prefer to communicate with a paramedic like me. But he, or she, should be trained to work with traumas and help people in difficult situations. It is important as they will understand my pain and feelings better and offer some interventions resting on an experience similar to mine. For this reason, it is important. You always want to be understood by others.* (EMT_M_0.9)

> *Someone with the experience, for sure...Because he or she will know the nature of problems we face.* (EMT_M_10)

> *Definitely someone who is familiar with my profession knows better how to help me cope.* (EMT_M_16)

> *The one with experience of EMS will, I think, will know more what I'm facing. He will, maybe, uh, he will be more understanding and by talking to him, I don't have to explain – like, you know, give explanation of my work, because he has been there…so, yes, probably someone with [a] history of being [a] medic. I will also feel, to be honest, more, uh, like, connected to him.* (EMT_M_12)

> *My perfect combination for a health professional would be a paramedic that has been trained to deal with a wide range of traumas, and difficult cases, because that person would understand the type of stress we are experiencing and would help us assess whether we are experiencing a normal stress level – as I believe that it is normal to have stress reactions due to our job role – or whether this is a kind of a traumatic stress.* (EMT_F_14)

> *For sure with a professional with an experience similar to mine, and who has the demanded skills and licence to work as a mental health specialist. It will be good as a person will understand my problem and help to cope with all the difficulties that are associated with being an EMS worker. I think it would be good for all of us. We will be ready to discuss problems with this specialist and rely on his or her judgements and experiences.* (EMT_M_15)

Therapists' gender did not play a role in participants' willingness or capacity to seek professional mental health support. The majority of the EMS workers (18 out of the 20 participants) reported feeling neutral about whether it was a woman or a man providing support, as long as the counsellor had sufficient experience and knowledge.

> *Well, I don't think it really matters. I mean…the only wish is that a person should know the subject and be experienced enough to help me. For this reason, I can be comfortable with both.* (EMT_M_0.9)

Timing and frequency of intervention

The timing and frequency of mental health support are critical determinants of success (Lawn *et al*., 2020). Some EMS workers stated that mental health support should be made available within 24 hours of critical incidents. Addressing post-traumatic reactions within the shortest possible time frame would prevent the accumulation of post-traumatic stress.

> *I think if the incident was so critical – for example, you attended a big MCI – then support should be delivered within 24 hours after that incident…I believe that it's better to deal with it as soon you start to develop negative thoughts and reactions, because you do not want to reach a point where you feel that you're drowning in your own thoughts and an advanced help is required to get you back on track.* (AP_M_0.2)

> *Immediately after a critical case, no doubt. I mean, sharing and talking after that would help much. It is important to do it immediately, or bad feelings will start affecting you, and you cannot get rid of them…That is why I always need someone to hear me and encourage me…without judgement or something like that…We all might need it in some moments, you know. It will make us stronger and inspire us to work and help others.* (EMT_M_13)

Some participants suggested that mental health support should be provided after allowing workers sufficient time for reflection and rest. For example, a break of a few days or a week would

allow workers time to reflect and prepare to discuss critical events with a therapist.

> *It's like, finishing the call, coming back to the station, just wanting to have a break from everything…you just need some time to rest instead of bringing back the whole scenario, details of that call and talk about it or whatever...it's like needing some time to rest, clear your mind…such things should be provided after days, not on the same day.* (EMT_M_11)

> *In my opinion, professional help shall be offered a week after the red case. It's important to have some time to absorb what happened…Because directly after the case, what happens is that bad feelings can overwhelm you…and you will feel as if you are paralysed emotionally, you will feel that you don't want to talk to others or deal at the moment with your feelings, you need time to just declutter your mind...so, yeah, from my personal experience, I would like to talk after a while about such cases, like after a week, when I feel much ready* [sic]. (PMED_F_19)

Moreover, participants emphasised the importance of having uninterrupted access to mental health services so that workers can access support whenever the need arises. The main concern is that frontline workers may not realise that they are experiencing post-traumatic stress – and therefore may not recognise that they need therapeutic support. According to the respondents, EMS workers perceive critical incidents differently. The same critical incident may be distressing for some, whereas others might remain unaffected (at least in that moment).

> *Mental health support should be available round the clock. Not only after a distressing call…because sometimes a call that is considered a disturbing for someone could be considered a regular call for another medic.* (EMT_M_0.5)

> *I think support must be delivered all the time, like a 24/7 service…Because some of us, we don't know that we are distressed or having signs of emotional stress…because to be honest, most of us learn to let go and move on…but sometimes, you cannot simply do that, you know – you cannot simply decide to let go and just go ahead with life…So, if there is something provided, like, all the time, then it will benefit everyone, I guess. Especially* [because] *not everyone will need that support at the same time. (EMT_M_0.6)*

Subtheme 6.3: A self-help app

Participants reported a desire for a mobile application to facilitate the identification and management of traumatic stress. In their view, a self-help mobile app focused on raising

awareness and teaching useful coping techniques would alleviate their post-traumatic stress reactions. Respondents suggested that such an app should incorporate content on post-traumatic stress symptoms and psychoeducation related to trauma and post-traumatic stress, along with ways of accessing mental health assistance.

> *It can be the first step for those who hesitate to ask for help…I think some medics would prefer to manage their emotions by themselves, so having an app for that would be useful for them.* (EMT_M_10)

> *We can just report our experience and feelings via app, and then it matches us to a relevant support, gives us options and maybe even assists us in scheduling a session with a specialist…it will also be a useful platform to promote awareness and understand the different coping methods.* (EMT_M_16)

Participants highlighted their employers' role in protecting employee confidentiality while developing mental health services. According to them, privacy is necessary to safeguard employee interests by, for instance, protecting sensitive information that could damage their reputation and diminish their career development opportunities.

> *However, it should be totally confidential to feel safe when using it. There will be sensitive information in this app, so we need to be assured that whatever is there will be confidential and that our privacy is maintained. (*PMED_F_19)

Respondents also highlighted the importance of having easy access to resources via mobile app in order to increase the availability of mental health support. As a result, workers' willingness to use mental health support services would increase.

> *It should be free, easy to access, and timely. Staff can use it whenever they have a time or feel the needed* [sic] *to, without a delay…for example, if I'm on duty and there are no calls, I can use it and check the available resources, check what does it says* [sic] *about my feelings, check whether I'm having a trauma response, and learn the useful strategies that would help me.* (PMED_F_19)

Subtheme 6.4: Raising awareness about post-traumatic stress

Participants highlighted the importance of raising awareness among all employees in their organisations about the challenging work undertaken by EMS personnel and the impact of critical incidents on their mental well-being. According to frontline staff, all employees must understand that EMS workers are often exposed to post-traumatic stress due to the nature of their work.

Participants emphasised the need for employees across all departments to recognise the importance of mental health support for frontline staff.

> *It should be something to be accessed by everyone in the field – not only those who are with severe reactions, you got me? Because everyone suffers from a* [sic] *time to time. It's part of our job to deal with critical red cases…you can't run from such cases. So all of them should understand that, and understand that it's not because we are less capable of handling the toughness of the job…by then, we will be more willing to seek assistance and not – not feel as if we are different and that it's fine to look out for help.* (EMT_M_11)

Subtheme 6.5: Creating a culture of recognition

EMS staff recommended that employers encourage a culture of recognition. That is, respondents advocated that top management as well as colleagues from other departments must recognise the difficulties and challenges that EMS personnel must face.

> *By showing support from directors in the organisation…it all starts from the top. They gotta show gratitude to the hard work we do as frontline staff, especially during the pandemic. There should be more appreciation for what we do and more focus on the mental well-being of staff working in the field. The mental well-being of frontline staff should be one of their priorities* (EMT_M_0.5)

> *It will be much easier if everyone in the organisation understands that we suffer from stress that comes with all those complex cases; it's a part of our job. It means it's vital to address it and ensure no biased attitudes are linked to it.* (EMT_M_15)

> *And I think that's why it's essential to let everyone – even staff in other departments and sections – understand that this is acceptable, that it's acceptable to face some difficulties and ask for support.* (EMT_M_12)

Participants also stressed the need for considerate managers who recognise the consequences of dealing with critical cases. Respondents called for their organisations to create a culture of recognition by having top management regularly commend frontline workers' efforts and encourage other colleagues to understand the challenging nature of EMS work.

> *I think managers should understand this idea that all staff in the field can be affected and that it's normal, to some extent, to have some undesirable consequences after responding to a difficult call…and this does not mean that we are weak or that we are being overemotional…they should understand this idea because sometimes we feel that they*

forget that we are humans. Then if they started to understand this, I think the staff in field will be more comfortable talking about their struggles and showing their emotions…once managers hold this view and recognise our efforts and hard work, we will be more willing to share our concerns and we will encourage each other to speak up when advanced help is required. (AP_F_0.1)

Many respondents agreed that incorporating workers' input in decision-making would help promote the acceptability of interventions. This view was put forth mainly by male, non-Arab employees (those from the Philippines and India). These respondents emphasised that employers should acknowledge their input and hear their 'voice', especially on issues and decisions that concern them, such as strategies or interventions for enhancing their mental well-being. Moreover, they indicated that top management should conduct evaluations to understand employee attitudes and perspectives before providing any service or intervention in order to ensure that all relevant factors are addressed.

They should involve us in such decisions. Sometimes, we feel abandoned or not being appreciated, because they take certain decisions that eventually affect us without even having a discussion with us…you know, at least listen from [sic] *us...maybe we can add a valuable input. So, yeah, I really think it is necessary to meet with us who work in the field or even conduct, like, a small group that contains paramedics and staff from the top management, in which we meet monthly…and hear from us, at least inform us before establishing any new service for us...Just make us feel included in such decisions and matters, as this will make services more acceptable and approachable by us.* (PMED_M_0.3)

I believe it's fundamental to discuss it with medics first. Yes, if you want staff to be attracted to that new service, then you have to sit with them and listen to their visions and thoughts…and before initiating something, you should meet with others and carry [out] *an assessment, see if you ticked all the needed boxes to make it suitable for medics.* (EMT_M_10)

They should shift from giving us orders to letting us engage in the decisions that concern us. We know what's best for us…if they want to establish a new service, they should listen from [sic] *us, give us the opportunity to be part of establishing that service…they must take our suggestions and hear our voice. It will even save their time, as it will make that service more likely to be approached by medics.* (EMT_F_0.7)

7.2.7 Theme 7: Frontline staff views regarding trauma processing interventions

Subtheme 7.1: Trauma processing

About half of participants rejected the notion that specific psychotherapeutic interventions, such as cognitive behavioural therapy (CBT), were necessary to help alleviate their post-traumatic stress. Respondents stated that such interventions would force them to relive the details of the traumatic event and worsen their symptoms. Therefore, CBT would not appear to be an effective intervention.

> *I think no, because why would someone want to go back to such memories? I mean, if it involves talking about the struggles after that, yes, that would be acceptable. But I don't think people want to go through what happened at that time in details and remember such stuff. There are people who maybe worked hard to forget that incident, for example, and doing that would not be so helpful for them – do you get me? Like, they may struggle more if they talked about it more in detail.* (EMT_M_11)

> *I mean, personally, I will be cautious and rethink about whether I want to bring back that case to my mind…it's a bit tricky and inconvenient.* (EMT_F_0.7)

> *…I think this is difficult. I think that the concept of going back to what* [got] *you in such a mess is difficult. Sometimes, it would be better to just accept it and leave it behind. However, it depends on person to person. Some people are okay with going back to such harsh memories and help themselves, and some are not okay with it.* (EMT_M_16)

Most of the participants opposing trauma processing interventions were also those who were most likely to evade thoughts and memories related to critical incidents by employing either avoidance or acceptance coping mechanisms. These interrelated views raised further questions about the acceptability of CBT-based approaches. For instance, one participant noted that persons with post-traumatic reactions would likely reject CBT out of avoidance, to forestall thinking about the traumatic event. This notion prevailed among those with work experience of six years or less.

> *Honestly, I don't think everyone would seek that…we, as people serving others, want to go forward with life and just throw away whatever brings tension to us…this is like the total opposite of distracting yourself and just simply letting it go.* (EMT_M_0.5)

Hmm…I think some medics will resist the idea of such therapies…especially that it involves bringing back the memory of such cases...imagine having reached a point when you finally accepted that, and – and, like, your [sic] *some way you're feeling better, but then you are asked to bring back that case to your mind.* (EMT_F_17)

On the other hand, some participants stated that they did not mind processing their trauma by recalling and reliving critical incidents, as long as they received the help they needed. These participants preferred processing their reactions to traumatic incidents through detailed conversations with their therapists. Notably, these were the same participants who searched websites to find help from trained professionals or from self-help books.

It could be helpful. Sometimes you need to fully process the whole case so that you can move on with life…As I already told you, if you remain alone, you might return to all those stressful events and suddenly you can't stop thinking about them. Then there is this one bad experience settling in your mind, and you cannot get rid of it...So, I think if you discuss it in more details with a specialist – someone who knows what they are doing – it helps to understand why it bothers you and eliminate factors making you constantly think about that event…perhaps you'll start understanding your thoughts, motifs, emotions and desires better, which is significant in such situations. That is why it looks like a good idea and a really useful tool that can be used in our unit. (PMED_F_19)

I think it might help when you go through and speak out your bad thoughts and emotions...so you don't keep re-thinking about it. Because that difficult experience will keep repeating in your mind, if you didn't process it. And if it helps to make a person go through what happens, will be better…a person can be aware of what triggers them…so probably they will understand what negative thoughts they have and, like, why are these thoughts are [sic] *still there in their mind. Maybe that will help to release these thoughts and feelings…and not keeping them to, you know, like, not to keep them within you. (EMT_M_12)*

Yes, I would seek something like this. Because I believe part of reco – recovery is bringing everything to the table…like, being aware of it and talk [sic] *with a professional about it.* (AP_F_0.1)

Also, a few participants reported a belief that colleagues who demonstrated positive outcomes from CBT would motivate their peers to seek that type of therapy for themselves.

But maybe if it worked with others, and that there are positive outcomes from such

therapies, then why not having [sic] *it here?* (EMT_F_17)

Maybe by showing some positive examples. If medics see that their peers who approached that treatment are doing well, doing better in terms of managing their distress, then there is a chance that they will get motivated. (EMT_M_13)

7.3 Discussion

7.3.1 Main findings

Common reactions of EMS staff following critical incidents

At the beginning of the interviews, participants expressed their respective motivations for choosing an EMS career. Some participants said that they liked the thrill and the fast-paced nature of their work, while others enjoyed the sense of accomplishment that comes from saving lives. The majority of respondents stated that they joined the profession to make a difference in the lives of others. EMS staff who chose this vocation to save lives and make a difference expressed feeling more guilt in the event of patient deaths than those who gave other reasons for opting to become an EMS worker. These participants were more likely to experience anger and report beliefs about life's unfairness compared to those who chose the career for ‘a good adrenaline rush’.

The types of incident participants identified as critical or ‘red’ (a common term used to refer to a critical case) varied. Such cases commonly involved severe injuries or deaths of child patients, mass casualty incidents, hazardous scenes and motor vehicle accidents. Staff described these cases as distressing because they felt helpless, at personal risk, or uncertain due to insufficient resources at their disposal. This finding aligns with past research indicating that ambulance workers risk developing PTSD symptoms when they are subjected to incidents perceived as chaotic or when they feel helpless due to a lack of resources (Regambal *et al*., 2015). This stems from EMS workers being more likely to dissociate from the effects of the event when dealing with a critical incident. This is confirmed by Declercq *et al.* (2011), who found that subjective responses (characterised by feelings of fear and helplessness) to traumatic events significantly contributed to PTSD among EMS personnel.

It is worth noting that all participants reported a range of reactions when dealing with critical incidents. However, these incidents had varying degrees of effect. This could be because post-traumatic stress exists on a continuum, not everyone has the same needs regarding mental health

support. Several respondents reported experiencing nightmares, sleeplessness and flashbacks that persisted for days or weeks, following a traumatic event. Several respondents complained of sleeplessness, anxiety and overprotective behaviours after witnessing the serious injury of death of a child. Lack of appetite, self-blame and feelings of overwhelm are other common reactions experienced by EMS workers in the aftermath of critical incidents. Such emotions can directly affect EMS worker's performance and the quality of patient care they deliver. Some participants reported that a lack of communication due to post-traumatic stress resulted in poor performance.

Past research has consistently identified an alarming rate of mental health problems among EMS personnel. Donnelly and Siebert (2009), for instance, found that EMS professionals had a greater chance of experiencing PTSD because of the nature of their work, with prevalence rates ranging from 4% to 40%. Berger *et al*. (2012) confirmed this finding, noting a worldwide incidence of PTSD of 10%, with a higher prevalence among Asian emergency professionals than their European counterparts, with North American estimates being comparable to those of Asia. These findings indicated that generally paramedics experienced a greater incidence of PTSD than did police officers and firefighters. Similarly, Petrie *et al.* (2018a) reported PTSD prevalence rates of more than 11% among EMS professionals, while Wild *et al*. (2016) reported rates of 8%. Research in Poland revealed a PTSD rate among ambulance personnel as high as 40% (Rybojad *et al*., 2016). Khan *et al.*'s (2020) research evaluating the psychological well-being of paramedics in Saudi Arabia and Australia found variations among EMS workers in different countries. Compared to Australian paramedics, Saudi paramedics suffered higher rates of depression and PTSD and experienced significantly worse physical effects from their work. This difference may be attributable to the more gruelling schedule of Saudi medics and the more significant health hazards they encounter, as stated by the authors. Thus, cultural context is a primary factor to consider when designing and delivering mental health interventions to EMS personnel.

Although no research has yet targeted the prevalence of post-traumatic stress among EMS personnel in the UAE, this study did find that EMS workers in the UAE experience some levels of post-traumatic stress. However, it is possible that those not experiencing symptoms chose not to participate in the study.

Frontline staff's personal beliefs, coping strategies and sources of support

Personal beliefs and coping strategies

Data revealed that many frontline staff chose this career because they desired to make a positive impact by saving lives. However, some staff showed a tendency to feel guilty and to dwell on the

unfairness of life when a patient's life could not be saved. This guilt persisted among EMS workers with less than 10 years' work experience. It would appear that personnel with limited work experience have yet to develop a realistic outlook of critical incident outcomes, with the attendant understanding that not all patients can be saved. Moreover, some participants had a self-image of a helper and a saver of lives able to withstand the pressure of the job. Such a self-image could lead them to experience remorse in times of crisis when the ability to save a patient's life is outside their control. These findings are in line with a study conducted by Jonsson and Segesten (2004), who found that ambulance workers felt guilt and shame when they failed to save a patient; these emotions were common following traumatic events. Guilt is an unpleasant emotion that is associated with the belief that a person could have achieved a better outcome, had they behaved or thought differently, based on their core values (Kubany, 1994). Previous research has identified guilt as a contributing factor to PTSD (Kubany and Manke, 1995).

A further set of factors to be considered are the preferred coping strategies that individuals use in traumatic situations, and whether these strategies were helpful in mitigating their post-traumatic stress reactions. Many participants in this study were found to believe that everything happens for a reason, leading them to choose acceptance as a coping strategy. To cope with a traumatic event, these participants revealed that they would shift their focus toward things they could control, and away from things they could not. According to these participants, acceptance is a strategy to avoid feeling overwhelmed by negative thoughts and to view their situation in a more objective manner. These staff members use acceptance as a coping strategy to recognise that they cannot always control the outcomes of their work, allowing them to process events with more clarity. This strategy was more prevalent among participants from Arab cultures, perhaps due to the association between Islamic culture and belief in fate.

Other individuals preferred using strategies of distraction to avoid thinking about the traumatic incident they had experienced. Many participants indicated that they engaged in recreational activities and spent time with loved ones to alleviate their negative thoughts and feelings. This allows them to recharge and feel grounded, trying to appreciate their life rather than dwell on what happened at work.

On the other hand, the absence of a constructive coping method can result in compounding stress over time (Halpern *et al*., 2011; Wild *et al*., 2016). Distraction behaviour (e.g. avoidance coping) impairs the appropriate processing of emotions and sentiments, which may increase the risk of developing depressive symptoms (Herman-Stabl *et al.,* 1995). Avoidance techniques often

include purposeful separation from unpleasant stimuli, which has been linked to worsening mental health and increased psychological problems (Anderson *et al*., 2022). Even though it is not possible to predict how certain coping methods may affect a person's mental health and well-being in the long term, there is utility in developing interventions that incorporate a wider consideration of strategies for coping among professionals working in emergency services and taking into account the context in which these strategies are used (Di Nota *et al.,* 2021).

Furthermore, the use of religious coping strategies by certain individuals is another way to manage post-traumatic stress. Some participants reported that they relied on their religious or spiritual beliefs to help them cope with stress and solve problems. They reported that, as a result, they are better able to deal with difficult situations and can better regulate their emotional responses. This is true of people from Arab cultures in particular, but Muslims of other cultures as well as Christians also exhibit this behaviour. Moreover, a few participants indicated that humour helped reduce incident-related reactions.

Research participants reported using a variety of coping strategies, including keeping a journal, reading self-help books, going on walks and obtaining therapy through the internet. Some participants sought the advice of external skilled specialists, while others relied on literature. Self-management techniques included addressing the cause of post-traumatic stress, reading self-help literature and engaging in emotional processing as a means of self-healing.

Sources of support

Participants reported the benefit of having a supportive supervisor who takes time out of their busy schedule to support their staff. Such support is helpful in minimising the impact of critical incidents, especially when supervisors are accessible, eager to listen and willing to grant time off, when possible. Moreover, respondents highlighted that some supervisors foster a sense of solidarity within the EMS team, thereby strengthening employees' social support network. Participants noted that having a supportive supervisor from whom they can confidently seek assistance is helpful in managing their post-traumatic stress. This is because supportive supervisors can guide their employees, suggest strategies to alleviate their distress, grant time off following a distressing case, and listen attentively whenever staff feel the need to vent their emotions. This aligns with past research identifying a positive link between managerial support and stress outcomes among EMS personnel (Petrie *et al*. 2018b). In addition, similar research has identified a need for greater managerial and supervisory support in medical organisations to support positive outcomes for the mental health and well-being of EMS personnel (Sterud *et al*.,

2008a). Thus, both past and present research indicates that many EMS personnel respond well to support from their superiors.

Furthermore, many frontline staff depended on peer support from co-workers to deal with their post-traumatic stress reactions. In these interviews, peers emerged as fundamental facilitators of emotional support. Participants agreed that sharing emotions was easier with familiar and trusted peers because their colleagues had experienced similar traumatic events; thus, a colleague is someone they know and trust. Most participants emphasised that talking to their colleagues was helpful in managing their reactions, as they found their colleagues understanding of their situation given their shared experience and EMS background. Moreover, they found their peers to be trustworthy and empathetic because those who worked in the same profession as the individual could better comprehend what they were going through.

Past research has indicated that, for many EMS personnel, peer-to-peer support generated better outcomes than family support (Loudoun *et al.,* 2020). Peers are more inclined to confide in one another and to notice when a colleague is suffering. For example, one participant reported having urged a co-worker to seek help. This kind of support may alleviate some of the concerns related to seeking treatment. Such peer-to-peer support was found to be especially instrumental in strengthening the bonds between colleagues, which, in turn, helped to ease their PTSD. Van der Ploeg and Kleber's (2003) longitudinal study supports this assertion. Their research used a dataset of 123 paramedics in the Netherlands and discovered that low social support and poor relationships between employees were closely linked to PTSD. Moreover, findings revealed that the circumstances of being away from one's home country correlated positively with seeking mental support from peers. Compared to Emirati EMS workers, foreign workers were more inclined to form strong interpersonal relationships with their peers, perhaps to compensate for the lack of connection with their families in their home countries.

Social support has been found to be a protective factor that reduces the risk of mental health disorders. It has been posited that this is because resiliency can be fostered after a critical incident, as long as adequate social support is provided or acquired (Ogińska-Bulik, 2015). It is important for frontline staff to feel a sense of belonging when sharing their experiences with others, especially when discussing sensitive information concerning their mental health. Findings from the interviews in this study revealed that most staff did not mind sharing their emotions in small groups with people whom they trusted. Indeed, respondents reported that they would not feel comfortable undergoing psychological debriefing with colleagues from other departments or shifts,

possibly because they fear negative career consequences from being judged as weak. In contrast, staff from one shift (a single unit) could feel more connected with each other, thereby increasing social support and making participants more willing to share their feelings. This theory has been corroborated by a study conducted among police officers, which found that social support combined with expressing feelings when talking about distressing experiences with peers was associated with less severe PTSD symptoms (Stephens, 1997).

Additionally, the findings of this study revealed that female staff were more likely than male staff to seek support from loved ones (e.g. family members or life partners). Men reported feeling reluctant to express their feelings and experiences because of the widely held belief that men should not appear vulnerable. Accordingly, male staff depend more on peer support, knowing that their co-workers have similar experiences and are likely to be less judgemental and more understanding.

Perspectives of EMS personnel regarding current workplace interventions

In terms of professional support, many participants described an absence of mental health support in their organisation, including access to mental health practitioners or other interventions that might help to reduce stress following exposure to a critical incident. Some participants reported receiving no immediate support after a traumatic event, which often led them to experience negative psychological impacts. These participants emphasised the need to make professional psychological support available at least within 24 hours after the incident.

Early mental health intervention is necessary to ensure that EMS personnel receive support during the window of opportunity to prevent PTSD symptoms from developing and to reduce levels of absenteeism (Richins *et al*., 2020). According to Richins *et al*. (2020), for early post-traumatic interventions to be effective, they must be adjusted to employee needs. Such interventions must consider the fundamental factors related to implementation in emergency response organisations; these include the level of support from senior management, the organisational culture, and opportunities to create a supportive environment that enhances social cohesion and peer support within teams. Furthermore, Roberts *et al.'*s (2019) systematic review found that there was substantial value to be gained from implementing early psychological interventions to treat ASD and PTSD.

These evaluations of previous research identify the benefits of early intervention. The primary evidence of this study found that no professional interventions were provided to address post-traumatic stress among frontline staff. This lack of early intervention can worsen stress symptoms

and increase the risk that staff will develop mental health disorders (Kearns *et al*., 2012). Furthermore, it was found that the timing of psychological intervention is critical, because the timely provision of mental health assistance can greatly increase the chances of a positive outcome. Some participants expressed a need for frontline staff to receive psychological support within 24 hours of a traumatic event. After dealing with stressful circumstances, there should be an immediate opportunity for EMS personnel to express their thoughts and feelings.

On the other hand, some respondents felt that professional psychological support should be provided several days – or even a week – after the traumatic incident, citing the importance of allowing workers sufficient time to rest and reflect. Some respondents reported experiencing worsened symptoms when attending debriefing sessions immediately after critical incidents, particularly when debriefings focused on the procedural and technical aspects of the incident rather than psychological and emotional aspects. As such, some respondents are reluctant to seek help immediately after a traumatic case.

Debriefings were identified as the only formal interventions carried out in these organisations. A significant finding of this research is that debriefings conducted within DCAS and NA generally do not accommodate discussions of feelings associated with exposure to trauma. Thus, debriefings were generally considered ineffective in alleviating post-traumatic stress because they do not take into account the affective and psychological perspectives of employees' feelings. Nonetheless, although most participants stated that debriefings tended to be operational – rather than therapeutic – two female participants outlined beneficial debriefings that provided an opportunity to engage in some form of group therapy.

There remains some debate in the research as to the effectiveness of debriefing as an intervention. Wesemann *et al*. (2019), for example, found an increase in intrusive thoughts, PTSD symptoms and negative cognition after debriefing. This was also the case in Woods' (2007) study, where participants reported an increase in PTSD symptoms after debriefing. Wee *et al*. (1999), on the other hand, found that debriefing can reduce PTSD symptoms. Still, evidence of the ineffectiveness of debriefing as an intervention appears to outweigh any indications that it might be beneficial in helping EMS personnel deal with post-traumatic stress symptoms.

The potential benefits of an intervention can be mediated by how the intervention is carried out (Roberts *et al*., 2019). Wu *et al*. (2012) conducted a study on the effectiveness of critical incident stress debriefing (CISD) in alleviating symptoms of PTSD, anxiety and depression among a group of soldiers in China who had responded to a natural disaster; the study incorporated the cultural

context of China's armed forces, including cohesion training, as part of the intervention. Debriefing allowed the soldiers to feel a sense of unity and belonging when sharing their experiences, thereby increasing the level of social support they experienced. Their study argued that, for debriefing to be effective, social cohesion training should be included in the CISD intervention to increase social support among staff. Conversely, a recent systematic review identified no positive effect in carrying out debriefing for the management of PTSD symptoms following a traumatic experience (Winders *et al.,* 2021). Ultimately, in line with Wu *et al*.'s (2012) study, the researchers in this study emphasised the need to tailor the general framework for CISD interventions to fit the context of the organisation, rather than using standard debriefing procedures devoid of context.

Notably, study participants who were more willing to use coping strategies of distraction to deal with post-traumatic stress also tended to find debriefing helpful. According to these respondents, debriefing served to distract them from their exposure to trauma by forcing them to focus on the clinical procedures and areas needing improvement for patient care. However, avoidance is only a short-term strategy and can lead to negative psychological issues in the long term. Other research findings (e.g. Wild *et al*., 2016) suggest that ambulance personnel who use avoidance coping styles are at higher risk of developing PTSD.

Barriers to seeking mental health support

Low expectations of support from supervisors

Many participants reported low expectations towards their organisation, which erects a barrier against seeking professional mental health help. Some participants viewed their supervisors as busy, unapproachable individuals who would not be able or willing to provide help. Anticipating a negative response from supervisors when seeking help may be linked to management-level beliefs that such trauma is to be expected among EMS workers, and that such attitudes reinforce the stigma associated with seeking mental health help. Past research has found that, despite the availability of psychological services assistance, the majority of EMS employees are reluctant to seek professional help due to stigma (Lawn *et al*., 2020). Individuals are more inclined to seek assistance if positive views are held regarding such action, rather than negative preconceptions and stigma (Britt and McFadden, 2012). Furthermore, this study found that assistance is often sought based on the attitudes of close colleagues, such as same-shift co-workers and line supervisors.

Bennett *et al*. (2005) found that workplace stress brought about by insufficient senior management assistance elevated the level of psychological distress among paramedic employees.

Researchers concluded that a workplace characterised by insufficient social support – particularly from managerial staff – could make frontline employees feel insecure about expressing their feelings and increase their likelihood of developing PTSD. The problem, as interviewees reported, is that when staff lack the support of management, they may develop low expectations for the organisation's ability or willingness to help them deal with their emotional sequelae following critical incidents. This may be one reason why many participants seek strategies to accept their challenging role, relinquish their expectations of help from their employers and distract themselves from thinking about traumatic incidents.

Mental health stigma

Participants reported being reluctant to seek help due to the stigma associated with mental health challenges. Two types of stigma were identified by participants: social stigma (associated with societal norms) and mental health stigma (associated with the culture of the organisation), which is widely prevalent in the field of ambulance services (Clompus and Albarran, 2016). Additionally, past research into gender has noted that emotional expression may be stifled within male-dominated cultures, both in practice and in research findings (Boyle, 2005), which can be harmful over time. Most participants perceived themselves as people who save lives, rather than as those who need to be saved, a notion that appears to be associated with the culture of the organisation as well as societal norms demanding that men refrain from expressing emotions. In contrast, the desire to be of assistance and an attitude of tenderness are expected of women and are considered gender-appropriate, whereas men are immediately expected to manage and resolve issues on their own, according to participants.

A Norwegian study examining help-seeking behaviour among EMS personnel found that male-dominated occupations, such as ambulance services and law enforcement, were characterised by a culture that discouraged individuals from acknowledging psychological issues. This resulted in under-recognition of mental health problems and a reduced willingness to seek professional help (Sterud *et al.,* 2008a). Clompus and Albarran (2016) confirmed this finding, suggesting that a 'masculine' culture amongst EMS personnel shames those who attempt to discuss emotional experiences.

Negative perceptions of mental illness may make it more difficult for EMS personnel to detect symptoms and seek treatment (Cheng *et al*., 2018). According to a recent systematic review (Auth *et al*., 2022), creating a culture that motivates seeking mental health support, as well as openly discussing mental health issues, may aid emergency service professionals in recovering from

trauma-related psychological problems while also reducing the stigma associated with seeking help.

Moreover, participants' level of training and experience did not appear to affect their attitudes towards seeking mental health support. This was in line with Hazell *et al*.'s (2021) study, which found no significant correlation between mental health stigma and EMS workers' levels of training, education or experience. Hazell *et al*. (2011) did find, however, that a reduced level of mental health stigma among EMS personnel correlated with being younger, and having higher levels of empathy. Notably, mental health stigma is common among emergency response services professionals, incentivising them against seeking help and to instead maintain a stoic public image (Karaffa and Koch, 2015). This may in turn generate inaccurate estimations of the prevalence of mental illness among EMS personnel (Sterud *et al*., 2008a).

Fear of misjudgement

The majority of EMS personnel admitted that they were reluctant to seek formal support, due to the fear of being judged by their superiors. They indicated that being misjudged as weak or unfit for work might harm their professional or social standing. Frontline staff were worried that if they sought mental health support, their superiors might view them as unfit for their duties – such an assessment could very likely hobble their career advancement and imperil hopes for future success. Such well-founded fears underline why it is vital to protect the privacy of staff when implementing interventions. Fear of consequences was commonly reported among non-Emirati workers, who indicated that expressing a need for help could negatively impact their end-of-year performance evaluations. This could be because Emirati workers benefit from a guarantee to be promoted and hold managerial positions, whereas non-Emirati workers must be cautious about any factor that could negatively affect their career prospects.

EMS staff opinions of trauma-focused interventions

Past studies have shown that CBT may help alleviate the symptoms of PTSD and other mental health concerns in the long run (Bryant *et al*., 2019). CBT has been shown to enhance quality of life and cognition in individuals with PTSD and depression (Gramlich and Neer, 2018). Tehrani (2019) found that CBT successfully lowered paramedics' PTSD symptoms after treatment. Following one-on-one CBT sessions with a firefighter paramedic who acquired PTSD after failing to resuscitate a new-born infant, Gramlich and Neer (2018) found significant reductions in PTSD and depressive symptoms. A recent review by Winders *et al*. (2021) found that trauma processing using CBT was effective in reducing the mental health issues of EMS personnel.

Many participants felt that the use of CBT would not be appropriate in addressing their post-traumatic stress, because it would force them to confront the distressing emotions that arose during and after critical incidents. In other words, it is common for some staff members to reject CBT because they want to move onwards, not backwards. However, some respondents reported that they would be willing to try CBT if it might help to relieve their symptoms. Ultimately, staff opinions regarding the acceptability of trauma processing interventions vary, perhaps because respondents have varying levels of severity of post-traumatic stress symptoms.

Frontline workers' recommendations

Formal downtime

When participants were prompted to offer suggestions for ways of managing their negative reactions, one of the first proposals was the provision of time off after critical incidents to ensure that staff have adequate time to rest so that they will perform better when they return to work. Participants noted that they would be more productive and less stressed if they were given brief breaks during the day after dealing with a critical case. Past research supports this view – that is, the benefits of giving personnel sufficient time to recover (Gouweloos-Trines *et al.*, 2017). Gouweloos-Trines *et al.* (2017) found that perceived management support, perceived colleague support, and sufficient recovery time following exposure to traumatic events were all essential factors in creating an environment conducive to positive mental health outcomes.

However, Halpern *et al.* (2014) did not find a significant correlation between receiving time off and diminished symptoms of PTSD. This may be attributable to the fact that the effectiveness of time-out-of service depends on how an individual uses this resource. In other words, some individuals might use avoidance strategies during their downtime to cope with the trauma, while others may use the time to process their traumatic reactions. The authors argue that the optimal duration of downtime is less than a day; this helps individuals to process their feelings and thoughts instead of avoiding them (Halpern *et al*., 2014).

Professional mental health counselling

Another suggestion from participants was support from a professional with not only expertise in mental health, but also with a background in EMS work, so as to be readily accepted by EMS personnel. Several participants said that they would want to talk to a mental health expert with a similar EMS background who could relate to their experiences.

Moreover, staff suggested the availability of group therapy, which may help those in need of

affirmation from group members. Some staff highlighted the importance of having small groups with whom they could share their experiences and emotions, stating that listening to others talk would encourage them to talk as well, while also helping them feel comfortable expressing their emotions. Participants highlighted the importance of a trusted circle in which they could feel confident discussing their concerns. Thus, the work environment has an important role to play in the mental health of EMS personnel. This notion is supported by findings indicating that individuals experiencing mental health issues are more likely to achieve positive outcomes when they realise that they are not alone (Jones, Agud and McSweeney, 2019). In addition, this is linked to the positive outcomes associated with peer-to-peer support, as discussed previously, where personnel with an EMS background will be best able to empathise with the traumatic events that other EMS personnel experience on the job.

Moreover, many participants supported the idea of online counselling sessions. Because this approach facilitates anonymity, online counselling appeared to be more acceptable and convenient among respondents than face-to-face sessions. These online sessions were perceived to be more private and confidential, which appealed to many EMS personnel who did not want to risk being identified by the staff in other departments as needing therapy. This ties into the presence of a supportive workplace as well as push-back against gender stereotypes and other preconceptions that can prevent EMS personnel from seeking therapy. However, there were others, such as senior staff with work experience of more than 10 years, who preferred direct contact with counsellors who could provide support. One potential explanation for this trend is that, compared to junior staff, senior staff members may be less comfortable using digital technology. Previous research has confirmed that older individuals are less likely to use technology due to concerns related to the absence of social interaction and communication (Vaportzis, Clausen and Gow, 2017). Thus, when delivering an intervention, it is necessary to keep in mind that what works for one group of people may not work for another.

Online self-help applications

Another of the participants' suggestions was the use of an online self-help application to assist them in identifying whether they are experiencing post-traumatic reactions, to educate them about useful coping mechanisms, and to provide them with important contact numbers and links for further psychological help if needed. Participants believed that providing coping tools and useful information regarding what they might face after distressing incidents through the self-help application may save time for those seeking assistance. During a clinical experiment examining a self-help app, Van der Meer *et al*. (2020) found that, although the app showed no efficacy in

terms of reducing symptoms of PTSD, the results showed that it significantly reduced trauma-related negative cognition. According to the authors, lack of monitoring of actual application usage may have contributed to this result.

Raising awareness

Furthermore, participants noted the need to raise awareness about post-traumatic stress in EMS settings. Participants stressed the necessity of developing knowledge among personnel in the organisation overall regarding the challenging task of being an ambulance worker, as well as how exposure to critical incidents increases the risk of developing post-traumatic stress symptoms. As a first step toward the goal of raising awareness and developing such knowledge, participants reported that supervisors should lead by example. When supervisors do so, they encourage staff to have a positive attitude towards seeking psychological assistance. Leading by example includes a willingness to engage in group therapy and discuss emotions and feelings associated with traumatic incidents. Because participants believe that supervisors are their main link to senior management, participants also highlighted the necessity of having supportive supervisors who can educate other staff in other departments about the effects of exposure to critical incidents. The influence of supportive supervisors will, in turn, make others aware that frontline employees need help, that experiencing post-traumatic reactions is something to be expected due to the nature of the work, and that seeking support is normal – all of which can eliminate the stigma that staff members who seek mental health help are weak.

Creating a culture of recognition

Research participants agreed that, for interventions to be acceptable within the organisation, it is important to show gratitude to frontline personnel and let them engage in the decision-making process. They want their voices heard and their opinions considered. Previous research has found that involving ambulance workers in making important decisions and keeping them informed of important workplace matters can improve their well-being (Van der Ploeg and Kleber, 2003). This was corroborated by the participants in this study, who opined that frontline employees should be given a say in choices and important workplace issues that directly affect them. Ndikumana *et al.*'s (2019) study found a positive correlation between involving healthcare staff in decision-making processes in the hospital and their intention to remain in their job. This supported a prior study by Barr and Steinberg (1983), who demonstrated that engaging doctors in organisational decision-making processes resulted in favourable organisational outcomes and increased doctors' job satisfaction.

7.4 Strengths

One strength of this study was my familiarity with the EMS field. This familiarity was key in helping participants feel that they could trust me and liberally share their personal traumatic experiences and perceptions, as well as the adverse psychological effects of dealing with traumatic incidents, the need for mental health support, and how they relied on peers for help when the organisation failed to offer this support. Even international participants from India and the Philippines answered the questions unreservedly, perhaps because they trusted me as someone with the background and experience of being a paramedic. Additionally, participants may have felt more comfortable being open about their views and experiences because interviews were primarily conducted virtually due to the ongoing COVID-19 pandemic. Participants were interviewed from a location of their choice, which enhanced their privacy and freedom.

Although familiarity with the respondents could increase the research bias, this influence was controlled through specific strategies, including the use of an interview guide. Each participant was asked all questions in an order, and respondents had an equal opportunity to address each question. However, bias would have occurred if I assumed that I knew any of the respondent's answers. Occasionally, respondents inadvertently answered more than one question in a single response. When this occurred, I made notes on the guide, acknowledged that the interviewee had already responded to the question, and asked whether they had anything else to add when that question was reached. My PhD supervisors were asked to provide their input and feedback on the interview guide before participants were interviewed. Furthermore, they reviewed each transcript after conducting each batch of interviews to further help me reduce bias.

To avoid leading participants' responses, I used only objective follow-up questions and prompts. For example, some participants were unaware of trauma-processing interventions such as CBT. In these cases, I consistently provided factual information about these therapies, enabling all participants to answer the question and express their views without bias. Furthermore, I avoided using suggestive phrases and terms that could lead to confusion. For example, 'post-traumatic stress' was described as 'stress resulting from encountering critical cases or traumatic incidents' so that it would not be confused with ordinary or chronic work-related stress.

The use of purposive sampling is another major strength of this study, of which the primary goal was to explore potential strategies for modifying and adapting current interventions to manage post-traumatic stress in EMS personnel in the UAE. Rather than using random sampling and selecting subjects who might not be available to participate in the study, purposive sampling

enabled me to choose EMS workers with sufficient experience, interest and ability to communicate their views and experiences to provide valuable data. The participants were compatible with the study objectives because they had all experienced a critical incident. The interview data compiled their first-hand experiences to inform strategies for managing post-traumatic stress.

7.5 Limitations

The main shortcoming of purposive sampling is that it disregards the views of those who were not selected or did not respond to the researcher's email. I targeted two organisations and sent emails to EMS workers at both; the study recruited only those EMS workers who expressed interest and provided informed consent. Therefore, the study may have excluded EMS workers who would have expressed views different from those of the current sample. For instance, it is possible that purposive sampling favoured participants who could express their thoughts more effectively and excluded those who could not fully articulate their traumatic experiences. Additionally, although all participants agreed that mental health support was necessary, the study might have excluded eligible EMS workers unaffected by traumatic events who did not require mental health help. These possible exclusions constitute a crucial weakness inherent to purposive sampling. Consequently, the study results should be interpreted cautiously when generalising conclusions to populations or settings beyond the two studied organisations.

Another limitation was that the sample was heterogeneous based on age, nationality, educational background and years of service, resulting in reduced generalisability. Although such dissimilarity reflects the characteristics of the overall EMS workforce in the UAE, a larger sample would have generated insights more representative of EMS workers across the entire industry. For example, including more participants from varied nationalities, levels of training and age groups would have further enriched the qualitative data. If circumstances and time had permitted, I would have integrated more female and non-Arab participants.

Language barriers may have resulted in additional heterogeneity in terms of nationality. Because English was the formal language adopted in both organisations (for staff in the field), the study may have excluded otherwise eligible participants with limited English proficiency.

7.6 Reflection

Some interviewees were peers with whom I had previously interacted. As explained in the study's strengths and weaknesses, this familiarity was a significant advantage in that the participants

trusted me as a peer and freely shared their experiences and opinions, knowing that I was a paramedic with a similar background. Respondents expressed their genuine need for mental health support to address the adverse effects of traumatic incidents. In retrospect, this familiarity might also have constituted a disadvantage by inhibiting some respondents from exposing their weaknesses to someone they viewed as a potential future senior supervisor.

Deliberate strategies were implemented to minimise research bias that might arise from subconscious perceptions and assumptions I may have formed about my peers. For example, based on personal experience and previous interactions with colleagues, I believe that all EMS workers should have access to professional mental health support. This personal opinion could have interfered with the study if, for instance, I failed to ask related questions based on the assumption that I already knew respondents' beliefs. The interview guide and the assistance of my PhD supervisors helped to systematise the interview process, granting all respondents an equal opportunity to answer the questions regardless of personal beliefs. To further minimise bias, interviews were first conducted with unfamiliar participants to build my confidence and ability to engage later with familiar peers without the data being affected by personal relationships. Additionally, interviews began with simple questions, which served as 'icebreakers' to establish rapport. Furthermore, regular consultations with my PhD supervisors were helpful in maintaining objectivity and integrity.

Furthermore, the interview guide deliberately excluded personal factors such as alcohol or substance use. This strategy was necessary because participants would likely feel uncomfortable sharing personal information that could negatively affect their reputation and working relationships. For example, if asked whether they used alcohol to cope with post-traumatic stress, participants might answer untruthfully to save face. In addition, because alcohol is considered socially unacceptable in the UAE, participants would not want to reveal behaviours that go against prevailing cultural values. Therefore, excluding such questions was not only in the participants' best interests, but also enabled the collection of more accurate data from them.

Several aspects of this study were especially interesting. I deliberately suppressed my assumptions about the need for professional mental health support in order to avoid unduly influencing respondents. Furthermore, all respondents were asked the same questions to ensure that conclusions would be drawn based on verifiable data. Nevertheless, it came as a surprise that all frontline staff who were interviewed agreed that mental health support is critical. Another interesting finding was that debriefings helped some participants deal with negative emotions, even though most agreed that these sessions emphasised technical and procedural issues rather

than the mental and emotional well-being of EMS workers in the aftermath of traumatic incidents. However, it was unclear whether the benefits of such debriefings extended to the long term (for example, debriefings could be helpful in avoiding thinking about the critical incident in the short term but might induce more negative reactions later).

Gender constituted another surprising outcome. Due to the UAE's fundamentally patriarchal culture (Solati, 2017), participants were expected to have gender preferences regarding the mental health professional supporting them. However, the consensus was that the professional's gender did not matter; participants were concerned only about receiving sufficiently high-quality mental health services.

7.7 Conclusion

EMS workers need additional support – beyond personal coping mechanisms – to manage adverse reactions from critical incidents. Participants in this study recommended formal support by mental health professionals, provided that the format of any such therapy will safeguard their privacy and confidentiality. Debriefing practices currently focus excessively on procedural aspects of critical incidents without helping workers address their post-traumatic stress reactions. Fear of misjudgement and mental health stigma blunt workers' willingness and ability to seek informal support from supervisors. Notably, non-national workers were found to rely more heavily on peer-to-peer support than national workers, perhaps because they formed peer relationships more purposefully to fill the void of being away from their loved ones in their home countries.

Interventions recommended by this research include time off following critical incidents, professional counselling, self-help mobile apps to increase awareness and access to essential information on post-traumatic stress management techniques, raising awareness about post-traumatic stress, and creating a culture of recognition. Frontline staff members' views differed with regard to existing interventions for trauma processing. Some participants prefer interventions that promote healing by reliving traumatic incidents, while others opt for avoidant coping mechanisms and dislike revisiting traumatic events. All participants, however, agree that professional mental health support should be available to all EMS staff, regardless of whether they have suffered post-traumatic stress reactions. Still, opinions differ as to how soon such services should be made available following critical incidents – e.g. immediately, one day, or one week afterward.

CHAPTER 8: DATA ANALYSIS (SUPERVISORS AND MANAGERS)

8.1 Introduction

This chapter outlines the results of ten interviews conducted with two EMS managers and eight supervisors. The purpose of the interviews was to collect data about the effectiveness of current interventions and strategies to mitigate the effects of post-traumatic stress on the mental health of EMS personnel. Interviews were conducted on the basis of a defined protocol and recorded, after which they were transcribed verbatim. The data were analysed using the NVivo program.

This chapter discusses current strategies to manage post-traumatic stress of EMS personnel and the impediments that supervisors face when supporting their mental well-being. This chapter then delineates the recommendations proposed by supervisors and managers and concludes with reference to the limitations and strengths of the study.

Data from interviews with supervisors and managers was pooled for combined analysis due to the similarity of the interview questions asked. All participants were interviewed online via the Microsoft Teams application during the workday, as was their preference. Each interview was conducted for 45 to 50 minutes. The chapter presents the collective results of the interviews with a critical analysis of emergent themes.

Table 5: Summary of characteristics of participants (n = 10)

Participant	Position	Organisation	Gender	Age	Years of experience	Nationality
M_M_0.1	Department manager	DCAS	M	44 y/o	8 years	Emirati
M_M_0.2	Department manager	DCAS	F	46 y/o	4 years	Emirati
Sup_M_0.1	Shift supervisor	DCAS	M	35 y/o	4 years	Jordanian
Sup_M_0.2	Shift supervisor	NA	M	38 y/o	5 years	Emirati
Sup_M_0.3	Shift supervisor	DCAS	M	46 y/o	7 years	Emirati
Sup_M_0.4	Shift supervisor	NA	M	28 y/o	2 years	Jordanian
Sup_M_0.5	Shift supervisor	NA	M	47 y/o	7 years	Jordanian
Sup_F_0.6	Shift supervisor	DCAS	F	29 y/o	4 years	Emirati
Sup_M_0.7	Shift supervisor	NA	M	38 y/o	4 years	Jordanian
Sup_F_0.8	Shift supervisor	DCAS	F	31 y/o	3 years	Emirati

8.2 Emergent themes

Five primary themes emerged from the analysis of the qualitative data, namely: the impact of critical incidents on frontline staff, strategies to support frontline staff, barriers to providing mental health support to frontline staff, the views of supervisors and managers regarding existing interventions to relieve post-traumatic stress, and suggested interventions and strategies. Various subthemes substantiated the main themes (see Table 6 below).

Table 6: Themes and subthemes

Themes	**Subthemes**
Theme 1: Impact of critical incidents on frontline staff	*Subtheme 1.1: Well-being and performance of frontline staff*
Theme 2: Strategies to support frontline staff	Subtheme 2.1: Providing a listening ear Subtheme 2.2: Allowing time out of service Subtheme 2.3: Shifting medics to less busy units Subtheme 2.4: Debriefings
Theme 3: Barriers to providing mental health support to frontline staff	Subtheme 3.1: Shortage of staff Subtheme 3.2: Difficulty identifying critical cases Subtheme 3.3: Workload Subtheme 3.4: Stigma associated with mental health issues Subtheme 3.5: Privacy and confidentiality concerns Subtheme 3.6: Lack of awareness and skills
Theme 4: The views of supervisors and managers regarding existing interventions for traumatic stress	Subtheme 4.1: Trauma processing interventions Subtheme 4.2: Self-help applications

Themes	Subthemes
worldwide	Subtheme 4.3: Access to a professional mental health specialist
Theme 5: Suggested strategies to support the mental health and well-being of frontline staff	Subtheme 5.1: The use of suitable terminologies Subtheme 5.2: Integrating various resources adapted to the different needs of frontline staff Subtheme 5.3: Collective responsibility at all levels Subtheme 5.4: Activities emphasising relationships and belonging

Each of the main themes are discussed below.

8.2.1 Theme 1: Views of supervisors and managers regarding the impact of critical incidents on frontline staff

The first theme describes supervisors' and managers' perspectives on the impact of critical incidents on frontline staff.

Subtheme 1.1: The well-being and performance of frontline staff

Supervisors and managers agreed that critical incidents could make frontline staff feel emotionally distressed, which could negatively affect their performance. One supervisor stated that staff performance is most strongly affected by critical incidents ending in a patient's death and where staff witness the distress caused to the patient's loved ones.

> *The MICA team could not save the patient, and he died. I mean…like, everyone should know that time is priceless in such situations…and there was nothing the crew could do to save that person. His mother was desperate – she lost her only son…so it was a great loss for her…the case was very distressing for the team…the issue is that, sometimes, such difficult cases could negatively affect the medics' performance, you know…when you're exhausted and emotionally drained, you will not be able to bring out the best in you.* (Sup_F_0.8)

Another supervisor indicated that performance deteriorates when workers become fixated on a critical incident, questioning whether they could have done something more or differently for a better outcome.

> *Even if this effect is minor, it still matter* [sic] *in my belief… it matters because it affects the next patient in a way…uh, in a way that medics keep thinking about that patient, for example, who died an hour ago, or think about his family, or think about whether you did not do their* [sic] *best – you know, negative uh, thoughts, like, would come to affected medics and make them doubt themselves for a moment.* (Sup_M_0.1)

Another supervisor reported that frontline staff can become preoccupied with constant thoughts and reflections about distressing cases, which could lead to poor performance in their subsequent cases.

> *Because, think about it – if you're emotionally drained from one serious call, you won't be able to give your best in the next subsequent call…imagine if the following call is another red serious case – what would you do?…could affect the care provided to patients.* (Sup_F_0.8)

Some supervisors agreed that critical incidents affect frontline workers differently, depending primarily on their training and length of work experience. Work experience, in particular, refines workers' skills and resilience to withstand the emotional turmoil associated with traumatic events. According to supervisors, senior staff are better able to effectively cope with their post-traumatic stress reactions. Consequently, respondents believe that older, more experienced staff members suffer less intense physical and emotional consequences from critical incidents.

> *We as supervisors, we notice that older medics, with several years of experience in the field, have more resiliency than the newly joined medics…so, it's a matter of what you learn during your time in the field, in terms of how you handle the effect of traumatic calls on your physical and emotional well-being.* (Sup_M_0.5)

One supervisor commented that the negative consequences of critical incidents on frontline workers have caused many individuals to leave the profession. This has been shown in past research, which finds that exposure to critical incidents can result in a high employee turnover rate if personnel lack the appropriate training and coping mechanisms (Drewitz-Chesney, 2012).

> *This is why sometimes people don't stay in this job for a long time, because it's not easy, especially when you feel that you are in charge of either saving someone's life, saving the patient…or, like, making his or her condition worse. That's why if you don't find the right coping methods for you and the right people to help you, you might end up with health problems such as hypertension, anxiety and maybe more serious illnesses.* (Sup_M_0.7)

On the other hand, managers pointed out that, due to the nature of the EMS role, some frontline staff may not be able to handle the difficulties of the job. To a certain degree, frontline staff are expected to experience negative health impacts from critical incidents.

> *After all, no one can deny that being an emergency medical responder is not something easy – it's a tough job that requires a robust team who can handle the hardship of the job. So yeah, I guess it's anticipated that there some workers who are incapable of handing the stress and difficulties that come with being in the field of EMS, you know, responding to serious calls and treating severely injured patients…It's a tough job. (*M_M_0.2)

> *I think here comes the difference between who can handle this job and who doesn't…in other words, like, you would notice the difference between who can cope with all the trauma-related stress and who will be affected by it.* (M_M_0.1)

8.2.2 Theme 2: Strategies to support frontline staff

This theme considers the strategies and techniques that supervisors and managers use to help frontline staff cope with reactions following a critical incident. Five subthemes emerged from the data.

Subtheme 2.1: Providing a listening ear

All respondents agreed that one of the most helpful strategies to alleviate the post-traumatic reactions of frontline staff is to give them time to talk about their experiences and to listen to them. Sometimes, just listening to staff could be beneficial in relieving their post-traumatic stress reactions, according to these participants. One supervisor pointed out that this helps to make staff feel that they are not alone and that their hard work is being recognised.

> *Medics often come to talk to me, especially after difficult cases and sometimes whether they have some family problems. They might want to discuss their actions, emotions, or just talk about other things…it helps as they feel supported and that they are not alone…Sometimes all they need is someone who can hear and listen to them, you*

know…Sometimes listening to them even is part of supporting them. (Sup_F_0.8)

If any of the medics need help, for example, after a red case, then me [sic] *as a supervisor should know what I can do…although, to be honest, sometimes all what can we do is just listen to them. Like, I will listen and give some advice…But, after all, I think showing them that we are here to support them does make a difference for them. It makes them trust us and have confidence that we are here with them in the field and understand what they are going through.* (Sup_M_0.1)

I, for example, go to the unit and have, like, an informal chat with them and show them that I'm willing to provide help as needed. Sometimes all they want could be recognition of their hard job or just someone who would listen. (Sup_F_0.6)

Managers expressed that the responsibilities of a supervisor include communicating with frontline staff to listen and understand what they are going through. Managers view supervisors as the link between frontline staff and top management, and one manager suggested that supervisors should be proactive in encouraging staff to speak to them and seek mental health help if needed. Managers agreed that mental health assistance can be provided to distressed staff when supervisors listen to staff and communicate effectively.

*Besides, employees can discuss cases with their supervisors to ask for support or just to ensure they did everything right. So, it is an important part of their daily work to communicate and listen to their team. They are the tie between us and people there in the field…For example, if a supervisor had raised a concern about one of the employees in the field, I'm gonna make the necessary arrangements to communicate with other sectors, either internal or external, in order to offer the needed assistance for distressed staff. (*M_M_0.2)

We usually hand over this task to shift supervisors – they have the responsibility of listening and checking if any of the team members is in need for professional help. Professional help could be offered with the communication and coordination with other departments in the organisation…there is the health and safety section, which also has the responsibility of offering professional help if required. They have a person with a background in occupational health and mental health who can assist frontline staff with their mental health problems. So, basically, yes, we encourage supervisors to advise frontline staff to seek for [sic] *psychological assistance when needed. (*M_M_0.1)

Subtheme 2.2: Allowing time off from service

Most supervisors agreed that time off is necessary to allow workers time to deal with adverse reactions and restore their energy before proceeding to the next call. Some respondents reported that taking an hour or even a few days off from work allowed staff to 'return energised' and thus perform at their best for their patients.

> *I honestly think that taking a leave after a critical severe case is important. As I said, you need to have a break away from work…sometimes taking an hour break before heading to another call is all what medics need…Some medics might need one hour to rest while others might need a day or two to stay away from work…and then return energised and fully committed to provide the best for patients…it helps because they took the needed time to feel all the tension and tiredness from that critical case… which made them feel better when they are back to duty.* (Sup_F_0.6)

> *We understand that some time out of service could help them in distracting themselves from calls and-and things related to work and all that stress that comes with responding to difficult and major cases.* (Sup_M_0.2)

One supervisor indicated the necessity of taking a day off after dealing with a serious case, such as a mass casualty incident (MCI). According to this respondent, time off helps frontline staff to take their mind off the distressing incident and restore their energy with enjoyable activities, such as spending time with family and friends, so that they can 'let it go'.

> *it helps with changing your focus, uh, your thinking...You just want, for a day at least, to forget everything related to your duty, and do the things you love and enjoy – like, switch off your work mobile. Do not talk with – with anyone about cases or duty-related matters. Stay away from what reminds you of that stressful call…think about it as having a time to spend it with friends and family…and this all helps you to let it go, I believe.* (Sup_M_0.1)

Moreover, two supervisors indicated that having some time off following a stressful case could be a good way to reduce staff absenteeism. They pointed out that after time off, staff return to work renewed and energised, so the quality and efficiency of care remains high.

> *I can say that it depends on the situation whether the worker needs a full day or just a short break…so, yes, someone will need some time out to refresh, recharge, and be ready*

> *to move forward…and return to work with a better dynamism, to function better. In fact, having a break could even reduce the number of sick leaves.* (Sup_M_0.7)

> *Sometimes, even a one-hour break might be enough to help a person recover and ensure they can start working again…I think by offering breaks, we can even reduce the number of sickness absence* [sic] *taken by medics.* (Sup_F_0.8)

One supervisor described how time out of service following distressing cases maximises interpersonal relationships, as it allows workers to spend time with each other.

> *In my opinion, it's a strategy that might help staff not only to rest, but also to gather and express their stress, talk about the distressing case…and share their thoughts with each other, which all could be relieving and benefit them in managing their responses to that case. After all, they trust and motivate each other.* (Sup_M_0.5)

Managers agreed that supervisors have extensive experience in the profession and are able to notice links between their employees' stress and the critical incidents they encounter daily. Respondents noted that supervisors collect useful information from assessing their employees' behaviour and receiving their feedback, so they can offer helpful solutions during debriefings and monthly shift meetings. Managers believe that supervisors continually assess workers' performance, helping them to identify declines in performance and to propose suitable interventions. As a result, according to managers, supervisors fulfil their professional mandate of facilitating high-quality and efficient care.

> *You know, whenever supervisors meet with their staff, they get to listen to them, provide them with a break if possible…all depends on the circumstances…So, overall they would support them…and also get to receive feedback and useful information from the staff during the regular monthly shift meetings and debriefings…they also – I would say they also know the medics better than us. They know their capabilities, their needs, as I mentioned, and also their limits…they are the ones who got to see their work, attend calls with them and evaluate their performance…and this* [is] *how supervisors ensure to maintain delivering a high quality of care to patients. (M_M_0.2)*

Respondents' views differed regarding the duration of time needed out of service. Some supported short breaks of 30 minutes to two hours, while others felt that one day off was appropriate if workers needed more physical distance away from work to regain their energy.

Various factors determined whether and for how long supervisors could allow time off. For instance, supervisors can arrange a short leave of a few hours if a team has just dealt with a major critical incident and needs time to rest before the next call. One supervisor indicated that arrangements for providing full days off are only possible when there are other teams on standby (and thus no shortage of staff).

> *I don't think that will be an issue if one of the staff requested some time to rest or take a break for half an hour to one or two hours.* (M_M_0.1)

> *Sometimes, I ask the medical dispatch to provide at least an hour break for the whole unit who responded to a red critical call…especially if I see that people are really exhausted. Sometimes I might talk to a person…it depends on the situation, you know.* (Sup_M_0.7*)*

> *Depends how long that time out of service* [would be]. *If for one hour, I think it's manageable, but if for more than an hour or day, it could be difficult to permit that, because if every medic wanted a time off after a red call, then probably there will be* [a] *huge shortage of staff and some units will* [be] *out of service.* (Sup_M_0.3)

> *I think it depends whether we have extra medics on the shift. Yeah, sometimes we have extra staff on the shift, making it possible to give a leave for a day or two – maximum two days, I would say. The thing* [is], *there are seasons when we know that we are facing shortage of staff, like in December, for example. So, yeah, at times it would not be feasible to give everyone a leave – maybe for an hour after the critical call, but not for several days…sometimes medics need a break before proceeding to the next call.* (Sup_M_0.5)

The frequency of time off matters to managers. Respondents expressed concern that staff members could make a habit of asking for off whenever they experience adverse reactions from critical incidents. One manager believed that time off should be considered only in extraordinary circumstances when a worker is experiencing severe reactions from a critical incident. According to this manager, the problem worsens if several workers ask for time off simultaneously and after every critical incident; part of their role as EMS workers is to be able to 'handle and deal' with critical incidents.

> *The only issue could be that if a staff* [sic] *keeps asking for a leave after each critical case, that will have some implications for the service. After all, their role – the role of the emergency responders – is to handle and deal with serious emergency cases. So, what I*

wanna say [is] *that it's somehow unreasonable to let every paramedic take a day off following each critical case.* (M_M_0.1)

To control the frequency with which staff members requested time off, some supervisors and one manager recommended that frontline staff utilise their annual leave days in batches or take one or two weeks off every few months, if possible. According to these respondents, frontline workers should use their annual days in several lots to allow sufficient breaks between critical incidents. Taking off for few days or weeks several times over the year enables workers to 'rest, recover or gather thoughts' after a critical incident.

See, I think with that role, which involves responding to many tough calls, it's like you must take a leave every three months at least...like, request a leave, take days from your annual leave. You need a break for a week at least…it's not something that should only be requested after one tough case, it's something that is necessary for everyone, as part of dealing with the job stress. (Sup_M_0.1)

In extreme cases, a person can request a formal leave from their annual leave balance…it's OK if this person wants some time to rest, recover or gather thoughts, they can take some days off or take a leave for two weeks every few months. (M_M_0.1)

Some supervisors suggested that very distressing incidents necessitate time off for the responding crew, despite understaffing. One supervisor indicated that in such cases, special arrangements would be made to ensure that work continues in the absence of released staff. Other supervisors revealed that being judicious about assessing effect of a traumatic incident on the worker – for example, by evaluating 'their mood, voice, and reactions' – helps them to decide when time off is necessary.

One medic, following the New Year Eve, he was assigned to emergency responders and responded to more than eight cases at that time, so when he approached me, I permitted him to take a leave for the next day. He mentioned that he was emotionally overwhelmed and couldn't stop thinking of the case. So I only could give him a leave for one day, due to the shortage of the medics at that time – you know how the situation [is] *with New Year. But I guess it made him feel better the following day.* (Sup_M_0.1)

During my time as a supervisor, only one has asked for that, and I was able to give him a day off the following day – for one day only, and I think that was helpful for him. He was –

like, he seemed much better the day after I gave him off…you could notice that through the way he talked and his voice tone. (Sup_M_0.2)

We work in extremely stressful conditions, you know it. No one is proof against such issues, and they might emerge constantly. For this reason, usually once a month, someone wants to talk to me and ask for a time out of service, I'll make my best to arrange for that through making some arrangements to the rota. Sometimes it might be more rarely, sometimes more frequently – it depends on cases and situations we have to manage. But usually, there is a person who needs this sort of support. I always try to respond. Especially if I see that a medic needs it badly…I mean, their mood, voice and reactions…they can show you if something is wrong and you have to respond. (Sup_F_0.8)

Subtheme 2.3: Shifting medics to less busy units

Another strategy is to transfer affected staff to less busy units. One supervisor indicated that this helps staff take a break from dealing with serious cases and thus 'sort out their emotions' and recover without needing to take time off from work.

A paramedic can ask for a leave or request to change their unit if they have been assigned to busy units, like changing to another, less busy area…if you are working on a very busy area, and you responded to many red calls, you can request to be transferred to an area which is not busy. At least the medic can explain his exhaustion and as a supervisor, I will understand that he needs time to rest and recover, and sort out their emotions. (Sup_M_0.1)

Another supervisor stated that it sometimes helps to shift medics from units that are known for assault calls or serious trauma cases to units that are more likely to be called in for mild or transfer cases, as a way to give frontline staff a break from repeatedly dealing with critical cases.

Sometimes I'll make special arrangements to shift medics from busy stations to less busier [sic] *ones where staff mostly respond to minor transfer calls…this could be helpful, especially when I notice that medics in unit X, for example, had dealt with many red calls. You know, some areas here are well known for the high number of industrial accidents and assault cases – that make*[s] *staff anxious and distressed from dealing with the high number of trauma cases.* (Sup_F_0.6)

Subtheme 2.4: Debriefings

In asking managers and supervisors about available interventions to assist staff following a critical incident, all of them mentioned debriefings. According to all respondents, debriefings provide a unique opportunity for EMS workers to discuss the procedural aspects of critical incidents. Supervisors stated that the main function of a debriefing is to discuss critical incidents and analyse workers' actions, care processes and shortcomings. All supervisors agreed that the information gathered from these debriefings enables them to identify areas for improvement and adjust procedures towards better performance in the future.

> *For us, these debriefings are more like doing a meeting and try to make staff feel that they are supported by us…but with more talking about what improvements are needed for the – the, uh, I mean, like, improvements in the skills and medical procedures, stuff like that.* (Sup_M_0.1)

> *We have* [a] *debriefing meeting, also called CISD* [Critical Incident Stress Debriefing]. *We offer that usually after in coordination with the disasters management team. It's more like we gather with the medics who attended the red case, like, hours after the case…and we provide feedback to them. They usually talk about the case and the struggle they faced and, you know, things that could be done better the next time they deal with such cases.* (Sup_M_0.2)

> *So yeah, it's like we discuss several topics, review some of the procedures and see how we could do better if we faced a similar case in the future.* (Sup_M_0.5)

Supervisors reported that debriefings are regularly conducted in the hours after major critical incidents, and after mass casualty incidents in particular.

> *We have debriefing meetings like Critical Incident Stress Debriefing, where we meet with the units who responded to a case that was critical, mostly MCIs, that are mass causality incidents. So yeah, these debriefings will happen after the call, like two hours after it, or even the next day… depends on the situation.* (Sup_M_0.5)

Furthermore, managers agreed that debriefings helped staff to share their experiences, along with identifying skills and knowledge gaps to support future improvement in quality of care.

> *I also believe that these meetings are essential in terms of addressing the staff knowledge*

> *gaps…It's like an opportunity for improvement…Sometimes I receive constructive feedback after these debriefings, as supervisors identify weaknesses, areas to improve work performance…even staff get the opportunity to offer their opinions and talk about their work experience.* (M_M_0.1)

One supervisor reported that focusing on procedural aspects could help staff manage their reactions to a critical incident by giving them methods 'to focus on the things within [their] control'.

> *But in fact, thinking about it, sometimes focusing on the problems – I mean, like what went wrong in the case and how to fix it, figuring out ideas on how to improve the work procedures…can actually be beneficial for the medics, because sometimes it's better to focus on the things within your control and try to solve them instead of dwelling over things you cannot control…like the patient who died or the child who ended up with a deformity…it eases the stress, I believe.* (Sup_M_0.5)

In addition, one supervisor pointed out that staff members feel more comfortable sharing their experiences during debriefings in the company of colleagues of similar backgrounds. When staff share their feelings with their colleagues in a small group, they feel that all of them are 'in the same boat'.

> *Because everyone gets the chance to express their feelings, by that way they will feel they are in the same boat…like they are not alone in this. You know, especially when these debriefings are carried out in a small group – like, only with their colleagues who attended the same serious case…I also think they get more comfortable when they have the chance to talk with their colleagues* [who] *share similar background, same language…perhaps they trust them more or feel more secured.* (Sup_F_0.6)

Most supervisors reported that staff are more comfortable sharing their emotions during debriefings held in small groups with colleagues from the same shift. However, sometimes employees from other departments or services attend these debriefings, which can make workers feel less willing to share their thoughts and emotions.

> *Maybe because these debriefings are taken* [sic] *place, like, in a group, so – maybe they don't share their emotions freely or whatever comes to their mind…because there are at least six medics in these debriefings, and – and sometimes police and civil defence are included in these debriefings.* (Sup_M_0.4)

> *I don't think that they would be comfortable discussing emotions in a meeting where there are more than two units and with, you know, a number of staff, like the drivers and the medical dispatchers could attend these debriefings – anyone who was involved in that case could attend the debriefing…sometimes, even people from other services.* (Sup_M_0.5)

On the other hand, managers find that formal debriefings, which supervisors conduct to support staff after critical incidents, are useful in terms of mitigating such incidents' effects on the well-being of staff. Managers believe that EMS workers acquire psychosocial support from their colleagues and line supervisors when attending these debriefings, as they get the chance to 'express themselves'.

> *Staff get opportunity to discuss how to help patients or what could be done better next time. They also get some time for discussing things, like how they felt or are feeling after the critical incident…so I would say they are helpful and could make them feel less stressed after attending a major incident.* (M_M_0.2)

Some supervisors reported the availability of a peer support group: professional support provided by the organisation to help frontline staff who are in need of mental health support following a critical incident. According to these supervisors, this group consists of five employees (paramedics and other employees with a background in psychology) whom staff can seek out via phone call when they feel distressed and need to speak with someone.

> *We also have the peer support group. I'm not quite sure whether staff communicate with the group – like, if they feel they want to talk after a complex case…it's more like a group of five, two or three paramedics and some other people from other sections, like the occupational health section, whom staff can call them* [sic] *and talk to them by phone. It's totally confidential, as far as I know.* (Sup_M_0.7)

> *It is like a group of five employees that help staff after responding to a major incident or help staff who feel emotional and want to speak to someone. So, I will definitely encourage them to seek this group if they feel they want to talk. They are based in Abu Dhabi but still can be contacted via phone. They ensure that the caller's privacy is maintained.* (Sup_M_0.5)

8.2.3 Theme 3: Barriers to providing mental health support to frontline staff

The third theme describes the barriers to providing mental health support for EMS workers.

Subtheme 3.1: Shortage of staff

This subtheme relates closely to workers' need for time out of service to recover from critical incidents. Participants agreed that taking some time out of service was important for workers to sort through their reactions, but they also reported that understaffing was a major hindrance. One manager discussed the contradiction between their professional mandate to facilitate high-quality care through timely response to critical incidents and their ability to grant workers time away from work, which can disrupt schedules and impede efficient response to incidents. Most supervisors reported that they have refused requests for time off outright due to understaffing.

> *We have many calls every day, and it is important to answer them. For this reason, we need full teams who can act fast and help patients. That is the main problem regarding such days off…Well, as I said, it's about planning and remaining effective. If we have a staff shortage, we cannot allow a person to have a day off. (M_M_0.2)*

> *If there is no shortage of staff, I don't mind to let the medic have some time off. The thing that sometimes we are facing – shortage of staff, you know – it is not always possible to give a medic some time off.* (Sup_M_0.2)

Managers and supervisors agreed that inadequate staff numbers often led supervisors to deny workers' requests for time off. Moreover, supervisors and managers indicated that the COVID-19 pandemic has exacerbated staffing shortages, as the number of calls has increased.

> *Because of COVID-19, there is shortage of staff…Therefore, this method is kind of difficult to employ.* (M_M_0.1)

One supervisor revealed that, if a worker requests a day off, but the supervisor cannot grant an entire day off due to staffing limitations, they will typically negotiate to decrease the amount of time off to one or two hours.

> *I think, as a supervisor, I would talk to that medic and see what else I can offer for him to help…I could ask the operational dispatch to make that unit out of service for a while, like for two hours…That could be done when communicating with the dispatch and sometimes they are cooperative in that matter. But this is only for a short period of time, like one or*

two hours. (Sup_M_0.2)

Human resources (HR) personnel were specifically mentioned by supervisors, with regard to securing approval for time off for distressed workers. One supervisor reported that, in most instances, HR denies time-out requests of more than one or two hours.

> *I think one or two hours are doable and could be approved by the HR the next day…but if it's more than one day, for example, I would suggest to the medic to request emergency or annual leave from the HR, because for me it would be difficult, especially if there is lack of staff. But if it's approved from the HR, then I cannot – I mean I cannot disapprove it. It's all about the capacity of the service to accommodate absences more than an hour.* (Sup_M_0.3)

Some supervisors reported that frontline staff do not ask for time out of service because they already recognise the problem of staff shortages. Some supervisors indicated that only one or two workers had ever asked them for a break or a day off after responding to a serious case, whereas others had never made such a request at all. Still, supervisors agreed that the few who took time out benefited significantly.

> *It helps to be away from thinking of the stressful case. The thing* [is] *that dealing with critical calls, like straight* [a]*way, call after call, could lead to exhaustion and fatigue. Like, staff would feel tired and could be having traumatic stress because there was no break between these red cases. So, they need a break from dealing with these stressful calls and that break will help them feel better and get their strength back…but, you know, it's not always possible to permit giving them days off due to lack of medics in the shift…and to be honest, medics are aware of that – maybe that's why they don't frequently ask for a break or leave…instead just simply take a sick leave* [chuckles]… *Two paramedics requested time off work, I remember, after responding to a child* [with] *third-degree burn*[s]*. I don't exactly remember, but I think that the child died on scene...I told them to take the rest of the shift off, so they can go home and rest. The next day was their off day, anyway. So, I think it was a good thing for them to just, just distract themselves, spend quality time with their family. I asked them later whether they felt better, like how they are feeling, and – and I felt that they were energised, I felt it. They were emotionally better, I would say, uh, from the way they spoke with me.* (Sup_M_0.5)

Subtheme 3.2: Difficulty in identifying critical cases

The majority of supervisors agreed that one of the main challenges of providing mental health support to frontline workers is identifying which cases are considered critical or traumatic. Supervisors reported that they often failed to offer mental health support because they were unable to distinguish critical cases that deserved an immediate intervention.

> *Sometimes I keep thinking, 'OK, so when do medics need urgent help…like what cases are we supposed to offer urgent help to the staff?'…because when you think about it, I might not detect the effect of every critical call on each medic.* (Sup_F_0.8)

Many supervisors revealed that different cases have different effects on frontline workers, and that not every case will be 'traumatising' to the whole ambulance crew.

> *One of the main challenges we face as supervisors is to know who need*[s] *help…like, it is quite difficult for us to recognise workers who are distressed, workers who are with symptoms, like those who are in need for support…You think it's easy, but it's not. Not every call could be traumatising to the whole crew, not every case could be affecting the whole crew in the same level or extent…It differs sometimes, from one person to another…and here it's* [sic] *the challenge in knowing who is affected and need help.* (Sup_M_0.7)

Another supervisor stated that they generally have an idea about which types of cases are typically distressing for frontline staff and carry a risk that frontline staff will experience post-traumatic stress reactions. These cases include mass casualty incidents, the death of a child, and cases that threaten the safety of the ambulance crew, such as violence and assault cases. However, frontline staff might also experience post-traumatic stress from other cases that are not recognised as critical to supervisors – for example, a case in which they treat someone who reminds them of a person close to them (or is in some other way a patient with whom they identify). This respondent emphasised that, when staff do not communicate their difficulties to their supervisors, supervisors find it hard to identify staff in need of mental health support.

> *In general, we have an idea about what type of calls could lead staff to exhibit symptoms of distress…like, for example, dealing with multiple casualties, death of a child, incidents where there is violence and when the ambulance team feel that the scene is unsafe, such as attending assault and domestic violence calls…Yet, you gotta put in mind that there are certain calls that also lead to stress…that could not be recognisable by us…for example, what about those calls where they remind you of someone close to you?*

Someone who you can relate to… it's hard, yes, and that is why we as supervisors should help staff be more comfortable in talking and communicating their feelings when they are stressed from a specific call. (Sup_F_0.6)

Subtheme 3.3: Workload

Supervisors collectively agreed that their highly demanding work responsibilities and often hectic schedules can get in the way of providing adequate mental health support to frontline workers. A supervisor's duties include managing and taking the lead in critical events; communicating with finance, HR and education departments; and reporting to various internal and external offices, such as the police. Because they must prioritise such duties, which are both imperative and time-sensitive, supervisors sometimes find themselves with little or no time to provide frontline staff with necessary mental health support, according to one supervisor.

Having to do all the communication with the CEO and the departments' directors, and carrying out a day full of scheduled internal and external meetings, sometimes I even forget to have my lunch break [chuckles]*. It gets to be demanding and stressful sometimes…Sometimes, we have to arrange meetings with the police, and we respond to big accidents,* [act as] *incident commander and take the lead…We also have to complete many tasks before the end of the shift, and sometimes it's really hard to assist staff and provide them with the necessary support, physically and mentally.* (Sup_M_0.1)

Still, supervisors recognise that supporting workers through their hardships is part of their role. One aspect of a supervisor's job description is communicating the needs of frontline staff, including their mental health needs, to top management. However, supervisors reported that their organisations pay little attention to mental health; instead, priority is given to operations and technical requirements, such as improving clinical care, patient management and ambulance response time. Supervisors emphasised the need for inclusive support from top management and other relevant departments in cases involving extremely stressed workers, in order provide optimal support for staff. When supervisors are overwhelmed by their own workloads, they may not be able to perform their own duties while simultaneously helping frontline staff maintain their mental health and well-being.

We here in the organisation, we don't really pay attention to the employees' mental well-being…we focus on the emergency response time, the quality of care and patients' level of satisfaction – like, such things which are basically related to achieving the organisation's

> *KPIs* [key performance indicators]*…We do understand that we have to support staff well-being; after all, it's part of being supervisors and leaders in the field. We must be the link between employees in the field and the top management…but the truth is that lack of support in terms of psychological assistance and self-awareness…I think support in this matter should be initiated by departments' managers and directors.* (Sup_M_0.7)

Subtheme 3.4: Stigma associated with mental health issues

Managers and supervisors revealed that stigma around mental health issues prevents EMS workers from approaching them for professional support. Stigma arises from societal beliefs that associate expressing feelings and seeking help with 'weakness'.

> *It's all about culture, I am sure, sadly, but our society thinks that if you attend a psychologist, it means you have some severe issues.* (M_M_0.2)

> *You see, our people have an idea that emotions show your weakness.* (Sup_M_0.7)

> *Some medics even will prefer – like, I noticed they will prefer not to discuss such details with their partners or supervisors. Maybe because, uh, maybe because of their childhood, their environment, some medics come from a culture that sees talking about such stuff as weakness, just like our culture. You know, just like here in this country, mental health still being seen as, uh, as…what to say…as something people avoid discussing, yeah. (Sup_M_0.1)*

Two supervisors indicated that the culture of the organisation and the EMS profession reinforce popular beliefs that associate weakness with expressing feelings. This makes it difficult for some individuals to share their traumatic experiences with their supervisors. According to these supervisors, this is a common concern within emergency services, which discourages individuals from showing such so-called 'weakness'.

> *Of course, there are medics who found it difficult to open up about their emotions and reactions after treating a serious patient. Opening up could be linked to weakness…I mean the emergency field, just like policemen and people in the civil defence…they all avoid speaking about their struggles and difficulties, because it's more like the culture of the emergency service…You cannot come and just, by one click, change that culture.* (Sup_M_0.3)

> *This is more within the context of the EMS, and also other emergency services…like, in these services, the hierarchy has an effect in a way that everyone should show strength and power, and only weak people stay in the bottom of this hierarchy.* (Sup_M_0.4)

One supervisor reported that this was more noticeable among senior staff with more than ten years of experience in the field. Participant indicated that senior staff are uncomfortable sharing their feelings because of a belief that they need to be mentors for their colleagues. Because they do not want to be seen as weak or unable to handle the pressures of work, they also avoid expressing their feelings or talking about distressing events with their supervisors, as well.

> *The culture of the organisation make you always want to be seen as the strong, tough man…and like we feel paramedics should not discuss these things because they should be mentally strong…especially senior paramedics, like those with experience in the field for ten years and more…they are the mentors, like the gurus…and whom others in the unit look* [to] *for direction…So, it's a bit, I believe, hard for them to share their emotions with anyone, even* [with] *us.* (Sup_M_0.3)

Some supervisors reported that both organisational culture and societal beliefs about mental health influence EMS staff's willingness to seek professional help. Workers tend to avoid disclosing their vulnerabilities to supervisors and senior management due to the shame associated with seeking mental health help (as is common in Arab societies) along with an organisational culture that requires each EMS worker to be the helper – 'not the one who needs help', according to one supervisor.

> *Both has* [sic] *a role in this. The culture of the service and, at the same time, the country itself. The culture of the ambulance service, where you have to be the life-saver and the strong person who actually provides help – not the one who needs help. And when you think about it, this is also related to the culture of the Arabs, the male Arabs, who must be acting strong and provide help to their family and not be the ones who ask for help or show weakness, because it's like a shame to do so…it's a very sensitive matter. Sometimes they rather hide their worries than ask for help.* (Sup_M_0.5)

Subtheme 3.5: Privacy and confidentiality concerns

One supervisor reported that frontline workers avoid asking for formal help because they are worried that supervisors might see them as being incapable of fulfilling their professional responsibilities. The participant emphasised the importance of privacy in such matters, because

showing vulnerabilities at work could threaten the worker's career.

> *Well, privacy is always important, to be honest…it's needed, you know. Staff have fear that they could be seen as not capable of doing their job. It can be viewed as a threat to your position, your role…Especially in such cases…I'm sure medics want to avoid being judged or misunderstood by others…for this reason, it is better to consider such issues and ensure that these matters stay private.* (Sup_F_0.8)

Some supervisors shared a perception that frontline staff believe their supervisors should be aware of only their positive attributes. Supervisors reported that, because they are involved in decision-making with other leaders within the organisation, including senior managers, their employees worry that reporting post-traumatic stress could negatively affect their performance evaluations with top management.

> *From my experience, when I was a paramedic in the field…it's more like, for me, that my supervisor should only know the good side of me…because after all, they are connected to the management team and maybe such issues will be later raised to them...So, I think medics in general see it this way – they see that matters like that should not be discussed with the higher authority.* (Sup_M_0.4)

> *Because I feel that they fear that we – I mean, as their supervisors – are obligated to report every single detail to people in the top management…some of them will even think that being honest about their feelings and doubts would mean not getting* [an] *'A' in their end-of-year performance evaluation…like it* [sic] *gonna affect their evaluation and then, in the long run, they think that it may affect the managers' decisions regarding promotions and other stuff.* (Sup_M_0.5)

When asking supervisors about existing opportunities to discuss feelings in debriefings conducted after traumatic incidents, most agreed that trust and privacy concerns have a chilling effect on discussions about emotions. According to the majority of respondents, EMS workers tend to share their deepest feelings only in the company of trusted colleagues who will not judge them.

> *I think because of trust and privacy issues, people are ready to talk about such matters only if they know that no one will judge or blame them. It is always difficult to share some personal information. That is why it can be very hard during such debriefings when many other individuals look at you and listen to your words.* (Sup_F_0.7)

Supervisors highlighted the lack of interpersonal bonds and trust, which inhibits workers from expressing their vulnerabilities during debriefings, especially when supervisors are obligated to include individuals from other services, such as the police. Frontline staff typically will not open up in the presence of strangers, according to one supervisor.

> *Not really, because in these debriefings, we usually do them for a group of medics…and sometimes people from other departments and shifts participate, so it's not always convenient to discuss such matters in these meetings…the last thing you wanna do is to open up or express your concerns in front of strangers.* (Sup_M_0.1)

One supervisor reported that few staff are willing to take advantage of the peer support group because of privacy concerns. Although seeking help from the group is confidential, staff still fear that their superiors will 'recognise' them.

> *Not really, you know, because of privacy reasons. You know, even if it's confidential, still staff fear that the organisation would recognise them.* (Sup_M_0.7)

Subtheme 3.6: Lack of awareness and skills

Some supervisors reported needing specialised training in conducting psychological debriefings to help frontline staff. All agreed that training and education in general are essential to equip them to support EMS workers. Supervisors understand that frontline workers' stress needs to be alleviated during debriefings, but supervisors also feel incapable of providing effective help due to a lack of relevant skills. One supervisor reported that other countries offer such training to supervisors; another proposed that mental health professionals should attend debriefings so that they can provide the necessary assistance.

> *If you think about it, we have not been trained to do these debriefings, and maybe some shift supervisors believe that it is not their role to organise them, because these debriefings need time and someone who is trained to do that – help workers express their struggles. I think in some countries, people, managers and supervisors attend courses to learn how to do these debriefings – or maybe an expert should be present and educate supervisors and assist them in carrying out the debriefing sessions.* (Sup_M_0.1)

> *Maybe also we need some special training for this – you know, like on how to boost confidence in staff and make them willing to express their needs…maybe we can collaborate with an external expert who can guide us in these debriefings – you know, until*

we become well trained to take the lead in them. (Sup_M_0.7)

Some supervisors argued that top managers' lack of commitment to frontline workers' mental health stems from insufficient organisational awareness of mental health issues. Supervisors indicated the importance of working with managers as 'one supportive system' to provide the necessary resources to assist staff following critical incidents.

> *I think awareness, especially for people holding managerial positions, is needed…with specific training for us to be able to work together and provide the needed resources for medics.* (Sup_F_0.6)

> *When people in the higher authority understand this, and how staff could be severely affected by it, they will be more committed to support them through providing the resources and services that promote their mental health…You know, services like the provision of a psychologist or trauma expert is* [sic] *something that had to be considered* [a] *long time ago…because by having the right people in the right place and knowledge, we will be able to unite, make one supportive system, encourage staff to seek help and provide the best possible support for those who are having emotional reactions.* (Sup_M_0.7)

8.2.4 Theme 4: Views of supervisors and managers regarding existing evidence-based interventions

This theme articulates participants' opinions about interventions for post-traumatic stress that have been found to be effective in other settings.

Subtheme 4.1: Trauma processing interventions

Some supervisors and managers reported that trauma processing interventions are prevalent in the field of EMS; they agreed that these interventions are important for the management of post-traumatic stress. These participants supported CBT and EMDR because prior studies have reported positive results for these approaches.

> *I think these therapies have been proved to show positive results in other settings. So, probably, we can apply them and see whether staff will be willing to seek that type of therapy.* (M_M_0.1)

> *Yeah, it could be in some way helpful. I don't know much about it, but if it showed some good results, then why not try it?* (Sup_M_0.3)

> *I think it can be good and difficult at the same time. It might be a good thing, because some staff need that thing – need to process, as you said, the whole event in order to let it go and move on.* (Sup_F_0.8)

On the other hand, some respondents opined that such interventions would be inappropriate for EMS workers; their main concern is that such interventions force workers to relive traumatic experiences, which might exacerbate symptoms. According to one respondent, the most effective method of dealing with post-traumatic stress is to distract oneself and avoid all thoughts or reminders of the traumatic incident; this notion is in direct opposition to the concept of reliving traumatic memories in order to process them. Some respondents believe that talking about negative experiences does not guarantee recovery, and that reliving traumatic events may even worsen workers' distress.

> *Actually, maybe this will not work with everyone. What if some medics get worse symptoms when remembering details of the incident, right? Sometimes people need to forget what hurt, they need to ignore it, otherwise they won't survive. They – they don't need to – to remember or bring back these memories or remember that, that – what happened exactly, do you get me? It is not something easy, I think, and not something medics will want to seek. That – that's my opinion.* (Sup_M_0.1)

> *I think it will be unacceptable for the majority of the medics in a way that people will not be comfortable to tell the trauma story, as you said, and bring the history of that story, you know. This is difficult.* (Sup_M_0.5)

One manager commented that frontline workers are likely to feel uncomfortable when introduced to unfamiliar interventions. Moreover, in addition to the challenge of persuading staff to participate in them, the development and implementation of novel intervention methods is also time-consuming, according to this manager.

> *I think it will take time to make it accepted by everyone…because it's something new and sounds a bit unusual. Unusual things make people uncomfortable…We might need additional resources and time…because it is a new method, and we should ensure we have needed finances. We should also plan it, and it demands time. We might even need the training department to first raise awareness about it and educate staff about those types of therapies and why it might help.* (M_M_0.2)

Subtheme 4.2: Self-help applications

Both managers and supervisors concurred on the practicality and usefulness of a self-help app to manage staff's reactions to distressing incidents. Participants supported the idea of a self-help app with specific characteristics to facilitate formal mental health support for frontline workers. Such an app should give frontline workers access to experienced mental health specialists by providing the contact information needed to conveniently book and attend appointments online. One supervisor suggested that a screening tool should be included to help workers to determine the severity of their post-traumatic symptoms before booking an appointment.

> *This application will be very useful, I think. As I told you previously, they will be easy to access, which is vital for workers. It will be a good step to raise awareness among workers…and I think it would be useful in identifying the severity of their stress and after case reactions…it will be a vital source of education and awareness for all staff…especially if it included online assessment, booking and more information about sources of help…It will even help staff to access mental care in a timely manner.* (Sup_M_0.7)

Both supervisors and managers supported the implementation of such an application on the basis that it would be easily accessible, convenient and practical for EMS workers. Supervisors and managers reported that most workers use smartphones; thus, equitable access to services would be achievable if all staff could easily access information and book appointments with professional counsellors. Both managers indicated that they are already considering establishing an online self-help app to provide mental health support for workers.

> *For this reason, the staff will definitely use it. It will also help to save time…During days off, medics want to spend some time with their families, meaning they might not want to go to a psychologist or something like that. That is why, if you have such an app on your smartphone, you can monitor your mental health from home, for example. You don't have to go to some place or other things.* (Sup_M_0.7)

> *Yes, it will really help, especially in the age of smartphones. I mean…today, we almost never leave our phones, so such apps might be helpful. They will save you time.* (Sup_F_0.8)

> *Sounds easy to use and easy to access and could be available for everyone.* (Sup_F_0.6)

> *I think it's needed, you know, online and everyone can use it. Plus, I think it will be beneficial in that whenever you're free – for example, at work or home, you can actually educate yourself or try some relaxation exercises. So, yeah, I think staff will use it and probably will encourage each other to use it.* (Sup_M_0.5)

> *Yes, we were thinking of implementing an online app. That is kind of similar to that app you described just now…I believe that online tools are helpful and useful because first you get to know that every person can easily access it, and second you can ensure that it's available for everyone. If a person needs support or needs to book for therapy, they can easily do that.* (M_M_0.1)

> *Yes, we also thought about using this app. Online tools are really effective now, and everyone can use them. So, I think it will be useful.* (M_M_0.2)

Some supervisors believe that such apps would be helpful for those who might otherwise avoid seeking professional help because of concerns about exposing their vulnerabilities. The app would allow workers to feel more 'secure' in their privacy.

> *I think nowadays and with the shift work, we need something that is easy to access and fast-working. Also, I think staff would be more willing to do things online instead of attending, like, physically. Maybe this will provide more privacy for them and let them feel more secure.* (Sup_M_0.3)

Managers suggested incorporating professional counselling into a self-help app; this would further enhance worker privacy and confidentiality, because personnel could book and attend therapy sessions anonymously.

> *We all have smartphones now; sometimes we even spend there the whole days* [sic] [laughs]*. So, tools available on your phone will be convenient and effective, meaning that medics will use them at home or work. It would help a lot, I am sure. Easy access, combined with anonymity, will make people less nervous…Staff can, for example, access online counselling as needed…It's like combining counselling with* [a] *self-help app to make it an integrated, handy tool for them. (M_M_0.2)*

Subtheme 4.3: Professional counselling

Supervisors' and managers' opinions varied regarding the merits of access to professional

counselling. Some reported that having access to either internal or external mental health professionals is useful. These participants believed that both have advantages and disadvantages for frontline staff: Whereas an internal mental health professional would be available around the clock for affected workers, external counselling guarantees more privacy and confidentiality.

> *Both internal or external can work. The one within an organisation will be easier to introduce, while another approach can help medics to feel safer, which is better if we speak about issues like these.* (Sup_F_0.6)

The majority of supervisors indicated that external mental health professionals would be more beneficial in terms of protecting staff's privacy and the confidentiality of their personal information. Supervisors highlighted the importance of privacy, stating that many workers fear that sensitive information could be exposed to other employees in other departments who might 'misjudge' them.

> *Interactions with a mental health specialist imply sharing personal info and talking about sensitive issues – issues related to personal life, family, childhood memories could be discussed in these meetings. You – you want to know no one will judge you or think about you in an undesirable manner. So…I believe that it is easier to organise such support outside our organisation.* (Sup_F_0.8)

> *Because thinking about the medics' privacy – and these things are sensitive, you know – so having an external person is better. More privacy will be provided for the medics. By ensuring privacy for them, more staff will seek that support…because they do not want to be seen as vulnerable and weak, of course. Maybe some people from other departments will misjudge them as being not capable of doing their work. So, yes, privacy is something important when providing that help for them.* (Sup_M_0.2)

> *Because for them, it would be better to talk to someone outside the corporation and not someone they see at work. This feels more private for them. More privacy will let medics* [feel] *more willing to seek that support. After all, medics do not want to be viewed as the people who are weak and need help…I think inside the organisation is difficult if you want to protect their privacy, especially* [because] *there are many departments in the organisation and many workers in these departments don't understand the work of the field. So, I think outside could be more, uh, like, better for them. They will feel more comfortable, I guess. (*Sup_M_0.3)

In addition, one supervisor pointed out that professional counselling should not replace peer-to-peer support. They noted that peer-to-peer support is vital because EMS workers are generally connected with one another, describing them as a 'supportive unit'.

> *I think staff need both – they need to speak with their colleagues and they also need to speak with a professional person…I think both help – speaking to your colleague at work is helpful because it makes you see that you are not the only person in the field who is distressed or showing signs and symptoms…you know, medics are connected, they are like a supportive unit…and thinking about it, speaking with a professional person will help you to know what methods you could apply to ease the traumatic stress – like, he is the expert in the field and knows what could help.* (Sup_F_0.6)

One supervisor mentioned the vital role that could be played by mental health professionals with whom supervisors can cooperate to identify individuals experiencing post-traumatic stress. They argued that having access to mental health professionals is fundamental for addressing workers' traumatic experiences.

> *Yeah, someone like that would help in knowing what kind of help and support is needed for each individual, you know…someone who actually has the profession in mental health. I mean, after all, we don't have the sufficient knowledge in such things – it all comes only from our experience…What I believe is that talking to a professional is different than talking to your friends and colleagues, or even your supervisors...When you discuss things like this with your friends and colleagues, for example, it's more like asking for suggestions, or just* [g]*etting things* o[ff] *your chest…You know, when you want someone to listen to you, and even if there was no response but it makes you feel relieved? It's more like that, I would say. But when you discuss these things with a professional, you are actually trusting them to give you solutions and guide you towards – towards finding ways to help you with that. (Sup_M_0.5)*

The majority of respondents did not consider the gender of the individual offering mental health support to be important.

> *For me, it is not important.* (Sup_F_0.8)

8.2.5 Theme 5: Suggested strategies to support the mental health and well-being of frontline staff

The fifth theme incorporates respondents' suggestions of potential strategies to address the

psychological needs of EMS workers.

Subtheme 5.1: The use of suitable terminologies

All supervisors and managers agreed that stigma is a barrier to seeking mental health support among EMS workers. Accordingly, supervisors proposed using neutral or even so-called *'*buoyant' terminologies that do not presume weakness or neediness. For example, terms such as 'mental illness', 'help' and 'therapy' could be replaced with more positive terms, such as 'support' and 'mental well-being', which do not connote helplessness, sickness or neediness.

> *I believe it's the way we use words describing a service for treating traumatic-kinda stress in medics…even if it's unintentionally, it does affect, I believe, the way they view themselves and the services provided…saying something like 'mentally ill' or 'mental' kind of health problems…do you get me? It's the words we choose. Let's use buoyant words instead – it might make a difference to paramedics' and other employees' views about the shame linked to mental problems and, you know, with the culture of emergency care.* (Sup_M_0.5)

> *Why don't we begin with changing some words that represent weakness and use other words, such as 'support'? Instead of saying 'psychological needs' or 'help', for example, we can say something like 'a support for staff's health and well-being'…saying 'mental well-being' instead of 'mental illness' or 'mental disease'…you know, no medic wants to say or admit the need for some help, but everyone here needs support.* (Sup_M_0.7)

> *I would say one of the factors is the language we use…you know, we can alter the way we approach medics and talk about sensitive matters with them…for example, it would be better for us and others in managerial positions to explain for the medics the different types of therapies that could be available for – in the near future – for them…but the way you want to explain it for them should be acceptable…We better avoid saying 'therapies', 'mental therapies for mental people'…we better say 'a support service', or 'a system to support us'.* (Sup_F_0.8)

Subtheme 5.2: Integrating an adaptable set of resources

Some supervisors agreed that different approaches could be combined and integrated to implement an adaptable mental health support system. These supervisors explained that it is difficult to choose just one or two mental health support approaches that cater to the needs of all

EMS workers, whose needs and preferences differ and who experience varying levels and severity of post-traumatic stress symptoms.

> *I think we can combine them, maybe, and see what would be useful, and what would be easy to be implemented and see how would staff* [sic] *approach these different interventions. After all, as I mentioned before, that* [sic] *people are different. What works for me might not work for others.* (Sup_M_0.5)

> *I can't decide which one would be the best or most suitable – but I think if we can, we could have different tools or services and maybe let employees have the option of choosing what could be convenient and most appropriate for them.* (Sup_F_0.6)

One supervisor outlined the importance of a system with various approaches for delivering mental health assistance to frontline staff – especially non-national staff, such as those from India and the Philippines – who might need specific types of support from the organisation to be more comfortable seeking help. Participant pointed out that one way to develop such a system would be to employ mental health experts who not only share similar cultural backgrounds with the frontline workers they treat, but who can also articulate and provide tailored support for EMS personnel.

> *One method that can be successful is having experts from different nationalities…What we can do, especially for medics from* [the] *Philippines and India, is make them feel more comfortable when discussing subjects related to trauma, the stress that comes from traumatic accidents, and the challenges they face at work…Having someone from the same background, speaking the same language, could truly facilitate these conversations and help stressed medics access the required type of assistance for their emotional reactions…You know, it could even let* [sic] *them more willing to seek mental health services.* (Sup_M_0.2)

Participants emphasised that there are various indicators of success in mental health support. Managers typically determine therapeutic success through workers' feedback, whereas supervisors observe workers' behaviour and demeanour. A significant proportion of supervisors attribute successful individual and team performance to therapeutic treatment.

> *If staff showed a positive attitude towards it, then it means that they are trusting that therapy, and – and that there is positive feedback from their peers.* (M_M_0.1)

That is simple. If you see that people feel better after it and recommend such strategies or – or therapies to others, you know it is a good idea. So, positive feedback for colleagues can help. (M_M_0.2)

Well, this can be examined by seeing the medics' productivity…and maybe their level of satisfaction before and after the implementation of a service. (Sup_M_0.3)

I think the feedback from the staff here is so important. Also, I think looking at their performance – you know, evaluating their performance – we do that as supervisors and, of course, we would notice if there's an improvement or a decline in such things. (Sup_M_0.1)

Managers and supervisors had different opinions about the most appropriate time to offer mental health support. Some supervisors argued that mental health support should be available 24/7, with additional formal support available according to workers' needs and experiences. Such respondents asserted, for example, that workers exhibiting severe reactions after critical incidents deserve immediate personalised support.

Well, I am sure it should be a continuous process. I mean…it is impossible to say an exact time… like, you know…it should be on a regular basis, like every month, or soon after the difficult cases which can be stressful for staff…Only if such interventions are regular [can they] *be effective, you know.* (Sup_M_0.7)

I think it depends on various factors…Sometimes, it is vital to deliver support just after a major incident. However, there should also be support services which are available 24/7. Well, I – I also think that we should focus on increasing resiliency and awareness. (Sup_M_0.4)

I cannot tell you a specific time, as all cases are different. However, I am sure that medics should be helped immediately after MCIs...But it does not mean that such support is unnecessary in other periods. So, it should be regular, I think. (Sup_F_0.8)

Others reported that support should be offered on an 'as-needed' basis. That is, supervisors should assess workers' needs to determine when formal support should be delivered.

I think, as the need arises. For example, if a paramedic approaches his supervisor, asking for help, then the supervisor can assess the situation, offers [sic] *a suitable intervention,*

or communicates [sic] *with us if additional resources are needed.* (M_M_0.1)

Subtheme 5.3: Collective responsibility at all levels

All supervisors agreed that senior management and colleagues from other departments should take a more active role in providing psychological support to frontline staff. These supervisors argued that their own efforts, combined with those of senior management and colleagues from other departments, would collectively improve workers' mental health.

> *We need to raise awareness about the importance of mental health of those who work as frontline. Managers and other departments need to recognise that, yes, they need first to recognise that…and I think this is important because once they understand it, probably the frontline staff will feel more appreciated. Sometimes staff – I mean, frontline staff – need recognition of their hard role and need to feel that those who are in the management and other sections understand – understand their difficult job. I think this is what needs to be done first. It all starts with them. Everyone should understand that it's not only the responsibility of supervisors…it's an integrative responsibility that each of us as employees here must take part in it* [sic] *to support frontline staff.* (Sup_M_0.5)

> *It's about the management team. I mean, they have the biggest role in this. If they started doing – I mean, viewing that mental health support or therapy is something that doesn't only concern shift supervisors and medics, then I believe everyone in the organisation would get it, will get that they are accountable in this, accountable in improving the mental health of frontline staff…That thing should come from those who are in the upper positions, you know. They should be the ones who communicate with other personnel from other departments, such as the HR section, and make them be aware of the importance of being committed to – to do what's needed to help staff.* (Sup_M_0.4)

Subtheme 5.4: Activities emphasising relationships and belonging

Most supervisors agreed that interpersonal relationships should be strengthened through activities that enhance workers' sense of belonging. Supervisors described the paramedics in their unit as having a unique bond; members share close ties and are influenced by one another's attitudes and views. Some supervisors posited that frontline workers benefit from the sense of belonging and count on peer-to-peer support to cope with the emotional sequalae of traumatic events. They agreed that older and more experienced peers offer fundamental psychosocial support to younger, less experienced staff members.

It could be as simple as commencing social activities and motivate [sic] *medics to participate…I can tell that medics in my shift have a close bond with each other. Their behaviours and views influence each other because they listen* [to] *and trust each other…so, believe me, having these activities could be helpful, as medics will be more connected to each other, and – and, in a way, it could help them to have better ways of coping with difficult cases.* (Sup_M_0.2)

Well, in my opinion, the more you enhance their relationship with each other, the more you are helping them, because you are decreasing their chances of having severe reactions…The staff in the field listen to each other, trust each other, feel they need to support and help each other…You know, it's more like there is a special bond between them. (Sup_M_0.4)

First, we shall have social events – let the medics realise that [the] *workplace is also a place where you can enjoy and have a good time with your co-workers…remember, they listen to each other…See, for example, if a paramedic starts doing meditation and reported positive feedback, then there is a chance that other paramedics will follow his step and start doing meditation. It's like a chain, you know. You will see that senior medics help junior ones…they guide them, and junior medics trust them when it comes to getting advice for their stressful reactions. (*Sup_M_0.5)

Another supervisor highlighted the importance of engaging staff in outdoor activities. When staff feel more connected to one another, according to this supervisor, they also tend to feel more supported, which might prevent 'the build-up of negative emotions' associated with traumatic cases.

I personally like to do some outdoor activities with my staff...You know, it's vital to distract [sic] *after every complex case, even if this is considered helpful for a short time. You should stop thinking about it, focus on other things, and understand that there are still good feelings and aspects that always help you…It* [is] *also a way of enhancing teamwork and relationships between medics because this makes them feel more supported and, of course, enhances their well-being. It could, you know, prevents* [sic] *'the build-up of negative emotions'. As they receive support from their peers, they get to develop a sense of closeness and understanding.* (Sup_F_0.8)

Managers reported that they often encourage supervisors to gather with their staff and engage

them in friendly contests, such as sports competitions, as a way to facilitate peer-to-peer psychosocial support.

> *We usually encourage supervisors to gather with their team members and encourage them to join the sports competitions, which run every three to six months, you know. It's fun, and medics get the chance to chill, get more connected…and this could be a way to support each other after a stressful event.* (M_M_0.1)

8.3 Discussion

8.3.1 Main findings

Overall, there are no significant differences in the management styles and approaches of the two EMS organisations whose employees were interviewed for this study. Across organisations, EMS personnel report facing similar challenges and barriers when trying to access mental health support, but their managers and supervisors demonstrate more varied ways of thinking about frontline workers' mental health needs – with supervisors generally exhibiting more understanding and empathy regarding the experiences of the EMS personnel than senior managers. This may be because supervisors had previously served as EMS personnel and therefore retained a more immediate understanding of the frontline employees' day-to-day struggles.

Supervisors recognise that dealing with critical incidents may trigger post-traumatic stress reactions, with mental health support being necessary to support staff as they recover. Moreover, both supervisors and frontline staff recognise the need to promote awareness among all employees in the organisation regarding the challenging role of EMS personnel. Furthermore, data suggested that the organisation should employ specific techniques and actions to assist frontline staff during challenging times.

The view of supervisors is markedly different from that of managers, who tend to have a more bureaucratic – or even military – mindset. Managers typically expect EMS personnel to develop resilience independently and adjust to the difficult working conditions of the career they have chosen. This mindset may stem from the close link between emergency care operations and military-type functions, where toughness and deference to hierarchy are assumed to be essential traits (Temby and Gucciardi, 2010). Managers themselves may have previously worked as police or military personnel in ambulance services before establishing an independent EMS service, given that ambulance services were formerly provided by police (Oafi *et al*., 2022). Thus, there is

a marked difference between the respective perceptions of supervisors and managers.

Supervisors provide informal psychological support to their employees. They consider such support to be informal because it is not part of their official roles and responsibilities; rather, they see it as a matter of personal diligence – an extra task that they must perform to support staff. This might be due to the fact that supervisors are aware of the experiences of frontline staff and their challenging role, because they all worked as EMS personnel in the past. Frontline staff, on the other hand, tend to believe that such support is – or should be – provided by supervisors on a formal basis in the workplace. Thus, there appears to be a 'grey area' in that some frontline staff receive mental health support from their supervisors whereas others do not. This discrepancy may create a gap between frontline staff perceptions and expectations of support from their supervisors, on the one hand, and their supervisors' approaches to – and perceptions of – providing such support on the other. This 'grey area' may account for the diversity of supervisors' approaches to providing support (e.g. time off, debriefings, listening). Due to the lack of consistency in delivering interventions (e.g. no formal structure), access to psychological support can become complicated and unequally distributed, rendering employees' ability to receive mental health support dependent on the discretion of individual supervisors. This potential for variation in frontline staff's experiences of supervisory support is a challenge that EMS organisations must work to acknowledge and resolve.

Perspectives of supervisors and managers regarding the impact of critical incidents on EMS personnel

Respondents shared insights into what they perceive to be the effects of critical incidents on EMS personnel. One supervisor believed that exposure to a critical incident would increase the risk of post-traumatic stress in EMS personnel, especially if the incident involved death of a patient. When EMS personnel are affected by such a death, their performance can deteriorate, worsening the quality of care they can provide. Supervisors also noted that EMS personnel would often ruminate about the traumatic event, constantly revisiting how they might have performed better. Past research has identified the negative impacts of post-traumatic stress on EMS personnel's performance (Adriaenssens, de Gucht and Maes, 2012; Al Enazi and AlEnzie, 2018).

According to supervisors, more experienced personnel have better outcomes (less reactions) with regard to their reactions to critical incidents. Supervisors also reported that more experienced EMS personnel, compared to their less experienced colleagues, are more likely to have a pragmatic outlook and are better able to manage emotional turmoil. Although managers

recognised the impact of post-traumatic stress on workers' performance, they generally hold the belief that because EMS is a challenging profession, EMS staff should be capable of enduring difficult situations and coping with post-traumatic stress.

Current strategies to support EMS staff following a critical incident

Providing a listening ear

Almost all supervisors stated that one strategy they employ to support staff is providing a listening ear for personnel who have experienced a critical incident. These supervisors perceived a high utility in engaging with supervisory and peer support to assist distressed EMS personnel. Supervisors noted that, when they listen to the feelings and thoughts of affected EMS personnel, these personnel tend to feel appreciated and validated for the hard work they accomplish daily, which helps them to better cope with their post-traumatic reactions. Previous research has demonstrated that EMS workers consider supervisors to be supportive when they acknowledge the impact of a distressing case and show concern and appreciation of the paramedics' hard work, especially when accompanied by a willingness to listen to the affected worker (Halpern *et al.,* 2009a; Auth *et al.,* 2022). Past research has also demonstrated the beneficial effect of social support provided by supervisors on the alleviation of post-traumatic stress symptoms, particularly avoidance and intrusion, among a group of emergency responders (Ogińska-Bulik, 2015). A compassionate supervisor and manager can facilitate good mental well-being in EMS staff by providing a safe setting for staff to expose their vulnerabilities (Auth *et al.,* 2022).

Moreover, findings revealed that managers view supervisors as the link between staff in the field and the top management. Managers expect supervisors to report matters related to the mental well-being of staff in order to make arrangements to accommodate them in coordination with other sections in the organisation.

Downtime strategy

Supervisors agreed that there is a need to allow time off for EMS personnel who have dealt with a critical incident, to enable personnel to recharge their energy and try to forget about the distressing case. Managers do not mind if their employees take time off, as long as the circumstances permit it. Many frontline staff pointed to this strategy, demonstrating its potential effectiveness in reducing their adverse emotional and cognitive reactions. Supervisors understand that allowing for time off enables the organisation to reduce the rate of sick leave

while allowing frontline staff to spend quality time with their peers, friends or family. Several studies have noted the benefit of time off; providing this resource to EMS personnel following a critical incident has been shown to reduce the intensity of depressive symptoms (Halpern *et al.,* 2014; Alden *et al*., 2021). Although having downtime was not significantly correlated with symptoms of PTSD, EMS staff indicated that having time out of service helped them connect with their peers while giving them time to explore their emotions and thoughts about traumatic cases (Halpern *et al*., 2014). Managers have stated that identification of EMS personnel who require time off should be left to the discretion of the shift supervisor, who has the necessary information about their team's resources and the needs of the staff.

However, this strategy can be challenging. Supervisors sometimes fail to recognise the incidents that staff deem critical, especially taking into consideration the fact that not everyone can communicate their adverse reactions to supervisors. Additionally, managers and supervisors highlighted that providing time off as a one-size-fits-all strategy is not appropriate, because it has the potential to be abused by staff, who may begin asking for time off after every critical incident. This can become a challenge by increasing the risk of staff shortages. For this reason, some participants believe that time off should be provided only after extraordinary circumstances, such as after dealing with a mass casualty incident (cases involve multiple injuries). However, past research indicated that EMS personnel experiencing distress rarely ask for downtime (Auth *et al.,* 2022), a finding in line with these results of interviewing frontline staff.

Respondents disagreed on the amount of time that constitutes sufficient time off; some participants indicated that one to two hours is enough, whereas others stated that at least a day is needed to recover. This difference of opinion is linked to staffing limitations, wherein any time off will disrupt staff scheduling. According to Halpern *et al*. (2014), a downtime that extends from 30 minutes to one full day is considered effective in reducing depressive symptoms among ambulance workers. In contrast, longer time-out durations (more than 24 hours) did not correlate with a lower depression score. Gouweloos-Trines *et al.* (2017) also noted the importance of having sufficient time to recover; they found that not having time off following a traumatic event, combined with a lack of support from peers and senior managers, was associated with elevated levels of occupational stress. Past evidence indicates that downtime and peer support, as well as workplace culture, are key factors contributing to the mental well-being of EMS staff (Auth *et al*., 2022).

Shifting EMS staff to less busy units

Some supervisors revealed an informal strategy they use to assist staff, namely shifting them to less busy units instead of offering time off. Supervisors acknowledge that, because of staffing limitations, they often cannot offer time out even if they want to. Thus, the next best alternative is moving the affected worker to a less busy unit. They believe that this allows frontline workers time to distance themselves from critical cases and deal with their emotions. Supervisors reported having a deep understanding of their staff's needs, revealing that they themselves took the transfer initiative if they were aware that EMS personnel had witnessed several distressing cases in their shift. Supervisors will usually transfer EMS personnel to quieter units dealing with patient transfers and mild cases rather than critical trauma and assault cases. Supervisors perceive this to be a viable and beneficial strategy, enabling staff to take a break from critical cases and process their emotions. It is worth noting that the aforementioned strategies are largely informal and undertaken at supervisors' discretion.

Debriefing

Managers and supervisors agreed on the usefulness of conducting debriefing sessions following a traumatic incident. Debriefings conducted in these organisations are seen as platforms to express feelings, but only in the context of discussing what went wrong in terms of the staff's medical and technical procedures. Moreover, the majority of supervisors noted that EMS personnel may be discouraged from sharing their feelings and thoughts if outsiders are present in the debriefing setting; staff may only be able to share their feelings and thoughts in a small group with peers from the same shift. However, although many supervisors noted that debriefing sessions were not helpful in getting staff to express their emotions, managers held the opposite view. That is, managers perceive debriefing sessions as directly supporting the mental health of staff, with some stating that EMS personnel can express their emotions and seek psychosocial support from peers and supervisors during debriefing sessions.

Past research indicates that paramedics feel comfortable sharing their experiences and feelings with whom they can trust (Drewitz-Chesney, 2019). Familiarity and trust encourage information sharing between ambulance workers (Drewitz-Chesney, 2019).

Almost all supervisors acknowledged that there are limitations to the support they can offer to their team. They affirm that they are not trained mental health professionals and therefore cannot fully engage with the distress of affected personnel. This may be why supervisors use debriefings to focus on the technical and procedural aspects of critical incidents, rather than allowing staff to

let out their emotions and thoughts. This may be an attempt to avoid bringing out emotions (due to cultural stigma), or perhaps supervisors feel insufficiently equipped to deal with such matters.

In general, psychological debriefing has been shown to have mixed results. Research also indicates that some EMS personnel exhibit worse symptoms after debriefings, while others seem to benefit from the intervention (e.g. Warren, 1995; Macnab *et al*., 1999; Wee *et al*., 1999; Woods, 2007; Wesemann *et al*., 2020).

Supervisors at NA also identified a type of formal psychological support provided by the peer support group, which was implemented to support frontline workers after traumatic incidents. This form of support is similar to psychological debriefing, in which staff can seek support via phone or in person. The peer support group consists of a few paramedics and other employees with a background in psychology. Respondents indicated that few frontline staff are willing to use this support system because of privacy concerns. Lawn *et al*. (2020) explained that, despite most EMS organisations offering formal peer support programmes, staff generally consider informal stress management strategies provided outside the organisation to be more helpful and approachable. According to Gouweloos-Trines *et al.* (2017), formal peer support methods may be useful because they help ambulance workers feel encouraged and supported by peers after traumatic situations. Although EMS personnel may not feel emboldened to speak up and share their feelings, conducting formal peer sessions could raise awareness of the event among distressed EMS personnel. However, frontline staff may be unwilling to seek help from the peer support group if they do not know the five employees in the group, being reluctant to discuss sensitive issues with strangers. In addition, results of frontline staff interviews showed that many respondents were not aware that such support was available. This could also be due to the fact that this strategy was newly deployed at the time of the interviews with frontline staff.

Perspectives of supervisors and managers regarding current interventions for managing post-traumatic stress

Trauma processing interventions

Some participants were in favour of trauma processing interventions, which have been shown to produce positive results, although this view was not common. Despite past research reinforcing the effectiveness of trauma-focused CBT and EMDR in treating PTSD (Alshahrani *et al.,* 2022), most participants (including managers, supervisors and frontline staff) believed that recounting and reliving the traumatic event might cause more distress to staff and thus worsen their post-

traumatic stress symptoms. One manager reported that such interventions might not be accepted at all, because EMS staff are unfamiliar with them; new interventions take time to become accepted by staff.

Self-help applications

Managers and supervisors agreed that use of the self-help apps, such as the SUPPORT Coach application (van der Meer *et. al*, 2020), would be effective in reducing the impact of critical incidents. Respondents generally agreed on the utility of online self-help apps to enable respondents to manage their adverse reactions in their own time. Being able to identify the type and severity of their symptoms would allow workers to seek appropriate and timely help. Therefore, supervisors suggest that self-help apps should feature helpful information on effective mechanisms to cope with post-traumatic stress. According to these supervisors, such an app would help employees to determine whether they need to seek immediate professional support. It could also help raise awareness among affected personnel of the potential need for professional mental health intervention. Supervisors added that the practicality, ease of use and privacy offered by a self-help app would be the key factors influencing its success.

Evidence suggests that utilising self-help apps may help alleviate some mental health problems in the general population. For example, self-help apps may assist in reducing anxiety (Firth *et al*., 2017), depressive symptoms and absenteeism (Birney *et al*., 2016). However, van der Meer *et. al* (2020) demonstrated that there was no significant difference in the level of PTSD symptoms following the use of the self-help app (although it significantly reduced trauma-related negative cognition).

Supervisors further indicated that using the app could mitigate fears associated with seeking out mental health support, counter stigma and address post-traumatic stress by raising staff's awareness of post-traumatic stress symptoms, potentially enabling more EMS personnel to seek help when they need it. Furthermore, participants believed that such an app would require features that allow EMS personnel to easily book appointments, access information related to post-traumatic stress and assess the severity of their symptoms in order for this type of intervention to be successful. These features would alert staff of the need to access help in a timely manner.

In addition to convenience, the assurance of privacy and confidentiality (compared to seeking support from direct face-to-face encounters) generated overwhelming support for a self-help app

among managers and supervisors. EMS workers would be able to book appointments anonymously and connect to external mental health specialists, thereby circumventing common barriers to mental health support, such as the fear of being labelled ‘weak’, as frontline staff affirmed.

Professional counselling

Managers and supervisors highlighted the benefits of professional mental health specialists being available for frontline staff. Three avenues of access to professional counselling were identified: internal providers, external consultants and mental health professionals embedded within self-help software on mobile devices. Supervisors recommended that all professional mental health assistance methods maintain anonymity and confidentiality. Some supervisors reported that internal service providers may involve the risk of divulging confidential information. These findings are in line with Ntatamala and Adams’ (2022) research, which found that many EMS personnel fear losing their privacy and being disadvantaged in their careers if they seek help from organisation-based mental health services. Findings from frontline staff also identified privacy as a major concern for internal mental health services. On the other hand, easy access to mental health professionals and 24/7 support make online counselling an appealing option. Apart from fears around privacy, some supervisors believed that external counsellors are a more appropriate option because they are not affected or influenced by the organisational politics that could undermine employee confidence in an internal mental health provider. One of the managers mentioned the advantage of using a self-help app along with access to mental health professionals as a combined strategy. Mental health professionals possess the skills and knowledge that supervisors lack to identify distressed workers in need of psychological support.

Barriers to providing mental health support

Lack of awareness and skills

Supervisors agreed that they should be provided with better training to find ways to assist staff experiencing post-traumatic stress symptoms and avoid unintentionally dismissing the feelings of EMS personnel during debriefings.

Several supervisors expressed the need for a collective structure in which managers help supervisors by offering them the resources they require to provide adequate emotional and psychological support to their frontline staff. The absence of effective support mechanisms may be a consequence of managers believing that frontline workers should develop their own coping

strategies and adjust on their own to their stressful working environment. This lack of mental health support and understanding has been identified in past research; Lawn *et al.* (2020) found similar results, suggesting that managers typically fail to understand and empathise with the challenges that EMS staff face daily. Rice *et al*. (2014) confirmed these results in their study, which was conducted among a group of healthcare workers (including EMS personnel).

Gaining support from senior managers can be the core concept of improving work conditions by strengthening the social workplace environment and enhancing recognition of staff by including them in decision-making (van der Ploeg, 2003). Many frontline staff stressed the importance of taking part in decision-making processes within their organisation. This is not only relevant for employees' mental well-being, but it also improves the organisation's procedural and technical aspects (van der Ploeg, 2003).

Ultimately, managers' lack of understanding about the role of EMS personnel can be addressed by developing an awareness of mental health support and recognising the effect of staff's mental well-being on their performance and the quality of care they provide (supporting the organisation's main goals). Petrie *et. al* (2018b) found that managers' level of commitment to the mental well-being of EMS staff influences the working environment because it fundamentally shapes the organisation's guidelines, policies and practices. Organisational support is crucial, because the perception of a supportive workplace has a significant and inverse relationship with the stress experienced in the aftermath of critical incidents (Gouweloos-Trines *et al*., 2017).

Staffing limitations often prevent supervisors from offering time off to distressed personnel. This is because supervisors need to ensure that an appropriate staffing level is maintained in order to provide timely emergency care to patients. Supervisors noted that many EMS personnel are aware of staffing shortages; they generally do not ask for time off because they expect that it will be refused. Alternatively, staff members are advised to take annual leave in a formal process that is accountable to their organisation's HR department.

Difficulty identifying staff who need support

Supervisors revealed the challenges involved in identifying staff who are in need of mental health help; it is often difficult to see the signs, especially when some staff are disinclined to seek help, according to these supervisors. Supervisors argued that it is not possible to identify the cases that are distressing for particular EMS personnel, because the effect of an incident is highly subjective and individual responses vary. Although certain events, such as the death of a child, a mass

casualty incident or an assault are widely perceived to be critical, EMS personnel may react differently to the same incident. Indeed, according to Donnelly and Bennett (2014), EMS personnel may be more affected by frequent commonplace cases than by major incidents. Researchers argue that EMS organisations should pay attention to the danger of accumulated stress from repeated commonplace incidents. If supervisors cannot identify which cases are critical for whom, they cannot offer mental health support to those affected. Some supervisors indicated that this challenge is the most difficult when EMS personnel do not reveal that they are experiencing severe reactions from a critical incident.

On the other hand, managers pointed out that supervisors should be able to recognise their employees' struggles and aid them, even if the employees do not ask for it. However, the impact of stigma has been identified as a significant barrier by past research (Auth *et al.,* 2022). As noted previously, male-dominated professions such as EMS are shown to have a culture that discourages people from disclosing psychological problems; this leads to an under-recognition of concerns and a decreased propensity to seek professional support. Clompus and Albarran (2016) found that EMS workers were generally embarrassed to express their traumatic experiences because of the 'masculine' culture.

Heavy workload on supervisors

A further barrier to the provision of adequate support to frontline staff was supervisors' heavy workloads. Almost all supervisors noted the busy, demanding and stressful nature of their jobs, admitting that frontline employees are often provided with inadequate mental health support as a result. For example, supervisors' responsibilities involve coordinating the work of numerous departments and reporting to a variety of external agencies. This places supervisors under significant time pressure, preventing them from devoting their attention to the mental well-being of their employees. some supervisors indicated that administrative and technical concerns, such as enhancing clinical treatment and patient management, are commonly given priority over the mental health of frontline workers in the organisation.

Mental health stigma

The stigma (both societal and organisational) attached to seeking mental health support prevents many EMS personnel from voicing their concerns to supervisors. Managers and supervisors agreed that the stigma associated with seeking mental health help prevents many employees from doing so.

Privacy concerns

Several supervisors noted that EMS personnel may be reluctant to approach them, primarily out of fear of being negatively judged. Supervisors feel that EMS personnel working on the frontline want their supervisors to view them in the most positive light; admitting to having psychosocial struggles risks negative judgement. Supervisors also pointed out that senior EMS personnel tend to hide their emotions because they themselves are mentors wanting to be viewed as strong team leaders who do not need help.

Managers' and supervisors' recommendations

The use of appropriate terminologies

According to supervisors, one of the strategies that should be implemented to support the mental well-being of EMS personnel is the use of appropriate terminology when discussing mental health related matters. These participants indicate how language and words can be altered to reduce mental health stigma and provide EMS workers with a more encouraging environment within which to obtain professional help. Many EMS personnel are afraid to seek help because they fear being stigmatised and considered weak. The use of positive terminologies, such as 'support' instead of 'help', may lead to reframing the utility of seeking professional support, according to supervisors. This change in terminology can diminish the stigma surrounding mental health. According to Volkow, Gordon and Koob (2021), therapists and researchers should be cautious with their language when describing psychological illnesses and individuals who are experiencing these illnesses. The authors emphasised that language affects individuals' interpretations and beliefs. A careful approach can help reduce the stigma associated with seeking mental health support, particularly in male-dominated fields.

Taking a 'one-size-does-not-fit-all' approach

Another recommended strategy was discarding the one-size-fits-all approach, instead personalising interventions based on individual need; such a mental health support system for employees could be implemented using a variety of techniques. Supervisors indicated that it would be a challenge to try to benefit all EMS workers with a single intervention. Because EMS professionals come from different backgrounds, a single strategy may not be effective. Moreover, because critical incidents might affect EMS staff in different ways (not everyone will exhibit the same level of post-traumatic stress), having alternative sets of interventions would better address a variety of staff needs.

Collective responsibility at all levels

Supervisors indicated that all levels within the organisation needed to share collective responsibility for promoting the mental health of EMS personnel. The mental health of employees is a responsibility shared by frontline employees, shift supervisors, senior managers and managers in other departments, such as HR. When it comes to providing frontline workers with psychological support, supervisors emphasised the need for assistance from upper managers and colleagues from different departments. Participants emphasised that providing mental health support to frontline staff requires a holistic effort across the organisation, with the cooperation of senior managers and other departments within the organisation being identified as particularly important. For instance, HR departments should accommodate supervisors who contact them to validate time off for distressed employees. In addition, some respondents argued that greater peer-to-peer communication should be encouraged. Many supervisors believe that only when collective action is taken at all levels of the organisation can the mental well-being of frontline employees be effectively supported. Such collective action is necessary because, according to past research, an organisation's response to the mental health needs of EMS personnel is a key predictor of psychological distress in these individuals (e.g. Lawn *et al*., 2020; Wagner *et al*., 2020).

Fostering a sense of relationships and belonging

The final strategy identified was the provision of interventions to promote personal relationships and a sense of belonging among frontline staff. According to supervisors, paramedics require peer-to-peer help to manage stress following critical incidents. Rather than strangers, frontline employees are more likely to disclose feelings of distress to trusted friends and co-workers. Supervisors characterised the paramedics in their shift as a close-knit family whose members influence one another's attitudes and behaviours. Some supervisors suggested that frontline employees benefit from a feeling of community and may rely on peer-to-peer support to manage the emotional consequences of their work. This was partially attributed to the widespread feeling of unity among EMS professionals. Numerous EMS supervisors highlighted the significance of interpersonal relationships, describing trust and privacy as essential components for communicating feelings and thoughts. This finding is supported by past research, which has found that most EMS workers enjoy supportive social ties that may serve as a protection against workplace trauma (Geuzinge *et al*., 2020). A study conducted among EMS workers in Australia found that promoting a sense of workplace belonging and supportive connections following a critical incident had a positive effect on the workers' mental health. The study revealed that

fostering a feeling of belonging among staff is an effective strategy that can be implemented to reduce the negative effects of critical incidents on their mental well-being (Shakespeare-Finch and Daley, 2017).

8.4 Limitations of the study

The main limitation of this study is the small sample size, which is a common challenge in qualitative research. Another limitation is the presence of selection bias; only those supervisors and managers who replied to my email and agreed to take part in the study were interviewed. Ultimately, only two managers from DCAS replied; none of the managers from NA participated in the study. Perhaps these two respondents were interested in participating in this study because they felt the need to intervene to support their staff's well-being. This could result in skewed data, with participants indicating support for taking steps to manage the psychological well-being of the EMS staff that may not represent the majority view or practice among these organisations. Another limitation of the study is that the findings of the study are not generalisable to other populations, given its qualitative nature.

8.5 Strengths

A core strength of this research is the analysis, which includes multiple perspectives on the topic and comprises ambulance personnel, shift supervisors and department managers as participants. Historically, the perspectives of supervisors and managers have not often been sought in research, which has tended to place its primary focus on EMS personnel. Thus, one strength of this study is that it takes a holistic view and identifies the intentions and perspectives of both supervisors and managers; their input is vital in implementing interventions because these individuals are responsible for service operations and managing organisational resources. Moreover, having different perspectives from different levels of the hierarchy helps address the gaps in the intentions and perceptions of these three groups (frontline staff, supervisors and managers).

8.6 Reflection

Because I am also a paramedic, one challenge associated with interviewing managers was workplace hierarchy. Compared to managers, supervisors appeared more willing to participate in the interviews – and with greater enthusiasm. It was not possible to interview more than two managers, perhaps because most did not have sufficient time to be interviewed.

8.7 Conclusion

The study finds that supervisors tend to provide as much support as possible to frontline staff by granting time off, shifting staff to less busy units, conducting debriefings and providing a listening ear. However, supervisors face substantial barriers to offering support, such as their high workload, that can prevent them from providing the support they believe the EMS staff require. Another barrier that supervisors face is the challenge of identifying incidents that may be distressing to particular staff members, because EMS personnel often decline to communicate with their supervisors about the challenges they face following a traumatic incident. In addition to the heavy workload and staff reluctance to seek mental health assistance, staff shortages constitute another barrier that prevents managers and supervisors from providing adequate support to their employees in the form of time off. Accordingly, managers and supervisors have suggested several steps that can be adopted: the use of positive terminology when discussing mental health; the implementation of varied interventions to cater to diverse EMS personnel needs; the establishment of collective responsibility at all levels of the organisation, particularly senior levels; and the implementation of interventions that emphasise personal relationships and belonging among EMS staff.

CHAPTER 9: SYNTHESIS OF FINDINGS

9.1 Introduction

This chapter begins by reviewing the steps used to create the ToC for this thesis and providing details to specify how they achieve the study's purpose. This chapter also discusses the development of the logic model (as it is linked to step 8 of creating the ToC), which first summarises findings from the systematic review and interviews and then illustrates how changes within the organisation could lead to desirable outcomes and achieve the long-term goal.

The primary aim of this study was to identify factors to consider when tailoring post-traumatic stress interventions for effective implementation in the UAE EMS context. This objective was achieved through a systematic review of worldwide interventions and qualitative research. The theory of change (ToC; Weiss, 1995) underpinned the process of building the study's logic model. Semi-structured interviews with frontline staff, supervisors, and managers were used to elucidate and understand potential pathways to effective intervention.

As discussed in chapter 4, a modified ToC method was used to formulate a series of hypotheses about desired outcomes. Using a modified ToC framework for the development and evaluation of potential changes within the service entailed several phases. In this research, the creation of the ToC framework followed the method outlined by Noble (2019) and comprised the following steps:

1. Analyse the situation.
2. Identify the targeted population.
3. Formulate a long-term goal.
4. Identify outcomes.
5. Identify actions.
6. Outline change mechanisms.
7. Describe sequences.
8. Create a logic model.
9. Address stakeholders and the facilitating factors.
10. Generate assumptions.

The first three steps were discussed in chapter 4. Accordingly, this chapter focuses on the

subsequent steps (4–10).

9.2 Steps involved in creating a theory of change and developing the logic model

Findings from qualitative research showed that all EMS personnel were exposed to the effects of critical incidents on their mental well-being. These incidents had varying degrees of effect. At the milder end of the spectrum of post-traumatic stress, self-help or peer support (and, perhaps, a downtime period) is often sufficient to minimise their reactions after critical incidents. However, there are some individuals who may need more specialized support due to problems that are more severe or enduring, and that is where more advanced types of help-seeking become important (e.g. CBT).

It is also worth noting that most individuals may benefit from a change in the organisational approach toward viewing post-traumatic stress and seeking mental health help. In other words, there is a need for a workplace environment that makes it acceptable to discuss this post-traumatic stress and encourages staff to seek support.

9.2.1 Identifying outcomes

Outcomes are desired results that occur before the long-term impact (Noble, 2019). As mentioned in chapter 4, this stage focuses on establishing the advantages to be gained by individuals or organizations upon implementation of the change. Outcomes are the same as ‘outputs’ in the logic model (discussed later). The outcomes identified in the current study to make a sustainable change within the service include:

- Building trust between EMS workers and superiors
- Creating a culture of recognition
- Experiencing less stigma around mental health and seeking psychological support
- Demonstrating reduced and shorter absences due to post-traumatic stress

These objectives were included as outcomes because they are considered (as shown in the interview findings) to yield short-term benefits (outcomes that occur before long-term impact), which may improve effectiveness when adapting interventions to the EMS context, ultimately leading to the desired long-term outcomes (long-term impact), which is to minimise the effects of traumatic situations on EMS workers.

9.2.2 Identifying required actions

This phase focuses on what should be done and what type of activities will boost the outcomes listed in section 9.2.1. This phase determines the inputs (resources) that form the necessary context for effective interventions and the activities (the interventions) shown to be effective in reducing post-traumatic stress in EMS personnel worldwide, along with any interventions suggested by participants.

A list of inputs and activities is outlined in the logic model presented in section 9.2.5. The logic model shows how combining these elements might lead to the desired outcomes (discussed later).

9.2.3 Outlining the change mechanisms

Identifying change mechanisms offers a deeper understanding of how the study is intended to inform change. As discussed in chapter 4, this step helps to understand the ways in which intended actions can lead to desired outcomes and long-term goals. It consists in describing how I would want individuals to participate in or experience the change that leads to the desired outcomes.

Data collected by interviewing frontline staff have revealed that certain change mechanisms (if applied) can contribute to the desired outcomes (as outlined in section 9.2.1) and long-term goals. These change mechanisms are important because they explain how frontline staff should engage with the activities, as well as the type of connection needed between them and their superiors (supervisors and managers) to achieve the desired outcomes.

Data from the interviews demonstrated what types of changes must occur to achieve the desired outcomes. These changes include the following:

- Being willing to discuss psychological issues related to facing a traumatic experience
- Feeling confident in seeking psychological help (whether formal or informal)
- Engaging in psychological debriefings (that are conducted appropriately)
- Feeling valued and appreciated for the challenging role of being an EMS worker
- Having a trusting relationship with supervisors and top management
- Feeling supported and encouraged to ask for help
- Having a non-judgemental approach when providing help

- Feeling secure about a future career
- Having a sense of belonging in the workplace
- Feeling trustworthy and included in the process of decision-making
- Being aware of the available sources of support and formal services

The above mechanisms of change are important because data from interviews with frontline staff and supervisors demonstrated that, in order to obtain the desired outcomes and impacts, these change mechanisms need to occur among frontline staff. These change mechanisms may all be equally important, except for the last one, which was outlined by some supervisors (not by frontline staff). The next section describes the sequencing of the changes and explains why these mechanisms of change are necessary for achieving the desired outcomes.

9.2.4 Describing the sequencing of the changes

Because post-traumatic stress exists on a continuum, not everyone has the same needs regarding mental health support. Symptoms of post-traumatic stress can be conceptualised as being normally distributed; many people may be experiencing only mild symptoms, some may exhibit moderate symptoms, and a few may go on to develop PTSD. This is one way to conceptualise the problem and thereby summarize the study's aims (the changes proposed might flatten this curve and/or shift it to the left).

Moreover, since the ToC is based on mechanisms, the effects of what is proposed will have different effects on different parts of the post-traumatic stress distribution. So, for those with mild and moderate symptoms, workplace-based changes (inputs in the logic model) may have the direct effect of making individuals feel better. Alternatively, this effect could be indirect, for example, enabling people to talk to colleagues or enabling people who are most affected to ask for and access mental health help.

Findings from the interviews revealed a potential process for achieving the desired outcomes and impact. Supervisors and EMS personnel alike agreed that EMS staff were reluctant to ask for help for fear of being judged as mentally ill or weak, which could negatively impact their job prospects. This result was more common among international workers than Emirati workers, making privacy an essential consideration when developing suitable interventions for some people. The interviews suggested that EMS personnel fear that their careers will suffer if they appear weak; therefore, they avoid displaying vulnerability whenever possible. Furthermore, the interviewees' responses indicated that the stigma associated with both the context of the organisation and

societal norms towards mental health acted as barriers to seeking professional support. Therefore, fostering a workplace that supports mental health help-seeking and encourages staff to discuss their traumatic experiences and emotions is foundational for building trust between frontline staff and their superiors. Such an environment also helps eliminate the stigma associated with seeking mental health support.

In addition, EMS personnel who develop trust with another person are more able to express their vulnerabilities. This proclivity was demonstrated by participants in the interviews, where some participants stated that they would be willing to express their feelings and thoughts in small groups with people whom they trusted. According to interviewed supervisors, when seeking mental health therapy, EMS workers must be free to do so without fear of repercussions. The lack of trust also manifested in frontline staff's beliefs that they would not be provided with all the necessary resources, reflecting a distrust in the organisation's ability to address their needs. Accordingly, organisational strategies should concentrate on fostering congenial, trustworthy connections between EMS professionals and their superiors.

Furthermore, data from the interviews suggest that promoting awareness in employees can change the EMS staff's beliefs regarding stigma and negative attitudes relating to mental health, which in turn could lead to positive attitudes towards seeking support. Notably, these data align with a recent systematic review finding that altering cognition related to weakness or incompetence is an effective tool in the management of PTSD (Kangaslampi and Peltone, 2022) and can increase the utilisation of mental health services. Increased awareness and utilisation of mental health services will lead to more social acceptance and positive attitudes towards seeking mental health assistance, as well as shorter or fewer days off due to mental illness (as stated in the outcomes in the logic model presented in section 9.2.5.).

Increasing the availability of support could help individuals who express delayed reactions to stress, making it difficult to identify them as being in serious need of support (as some supervisors mentioned). Making support available for everyone could reduce the risk of developing more severe reactions. In addition, some findings revealed that EMS personnel were more likely to accept mental health support if the problem was approached from a support perspective rather than a 'mental health illness' view. The support approach lends itself to preventing staff from feeling weak or incompetent, leading to the creation of a context with less stigma about seeking mental health help.

Therefore, understanding the sequencing facilitates understanding the stages by which a change occurs. The sequence can be summarised (if-then pattern) as follows.

- If managers are more aware of the effects of trauma, then frontline staff will experience the workplace as psychologically safe; if the workplace is experienced as psychologically safe, frontline staff are more likely to seek help.
- If frontline staff trust their colleagues, then they will have the confidence to express their vulnerabilities, as they will not feel threatened. If staff feel safe to express their vulnerabilities, they can seek support from their supervisors. Conversely, if managers are asked for support, they can offer assistance to employees and identify staff who need immediate help.
- If the level of awareness increases among managers about the effect of traumatic cases on the mental well-being of the frontline staff, the former might understand the type of reactions that the latter could experience and then normalise seeking help. If leaders normalise asking for assistance, less stigma will surround seeking help. If managers start showing positive attitudes (encouraging staff to seek help), then staff will feel supported when seeking help.
- If staff improve their effective coping strategies, then they can apply these strategies to cope with their reactions following a critical incident. If staff learn these strategies, they can become more aware of when to seek additional help.
- If supervisors have the time to provide support to staff, then they can listen to staff by engaging with them following a critical incident. If supervisors engage with their staff, then staff can feel that they have an approachable supervisor with whom they can discuss their traumatic experiences. If staff feel that they can discuss their traumatic experiences with their supervisors, then supervisors will be better able to identify whether a staff member is experiencing post-traumatic stress symptoms. If supervisors can identify affected staff, then early help can be provided to the latter.
- If the organisation can demonstrate a supportive approach (through having supportive peers and supervisors along with the availability of mental health services) to the mental well-being of frontline staff, then staffers might be more inclined to use available professional services and seek early treatment for their post-traumatic stress symptoms. This outreach will lower the risk of ASD and PTSD.

– If staff are trained to cope effectively with critical incidents and encouraged to become aware of the available sources of formal support offered in the organisation, they may be more willing to use these support services and encourage their colleagues to also seek support, if needed. This cycle will then lead to accessing support promptly and reducing the stigma surrounding seeking mental health help.

9.2.5 Developing a logic model

A logic model summarises connections between interventions and their expected results to clarify how an intervention might work (Baxter *et al.,* 2014). This process is aided by explicitly describing the ToC that underlies pathways from an intervention to its desired outcomes (Weiss, 1995). According to Rogers *et al.* (2000), logic models are generally built by combining the empirical results drawn from interviews with a review conducted by an evaluation team or key partners. In this study, a modified ToC approach was selected for handling the multifaceted nature of post-traumatic stress, which helped in the exploration of various elements that could minimise the effect of traumatic case on EMS personnel. The use of a modified ToC facilitated in the development of a logic model, which helped to identify factors that could contribute to the potential effectiveness of these interventions (activities in the logic model) in the context of EMS organisations in the UAE.

The logic model in the next section identifies the types of inputs, activities and outcomes anticipated to potentially increase the effectiveness of current interventions for EMS personnel. The use of a modified ToC allowed for gaps to be filled in the findings from the systematic review.

Figure 6 (below) illustrates how various data collection methods contributed to the components of the logic model.

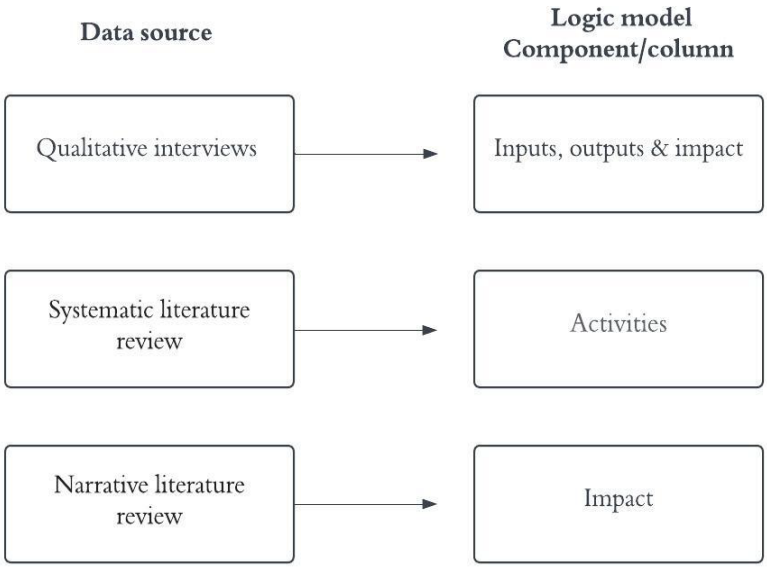


Figure 6: Data sources employed for the components of the logic model

An ongoing process of reflection on the components included in the logic model was made with supervisors until the development of a final version. Model development followed a process of explaining the chain of reasoning (mechanisms of change) behind how interventions lead to desired outcomes from left to right in an if-then pattern (as demonstrated by Baxter *et al*., 2014).

Figure 7 shows the logic model. The first column of the model shows the 'Inputs', which are resources that form the necessary context for the effective delivery of interventions, including factors that support the delivery of effective interventions for workers who experience post-traumatic stress symptoms (including ASD and PTSD). In other words, these factors facilitate an environment in which trauma-focused interventions can be offered.

The second column lists activities, which are the interventions that have been shown to be effective in reducing post-traumatic stress in EMS personnel worldwide along with interventions that have been suggested by participants. The third column represents the early/short-term effects arising from the combination of inputs and activities (these are the outcomes represented in step 4 in the development of the ToC). Finally, the last column shows the impact, which corresponds to the study's main goal (representing step 3 in the development of the ToC). Figure 7 below represents the logic model for minimising the impact of traumatic situations on EMS workers.

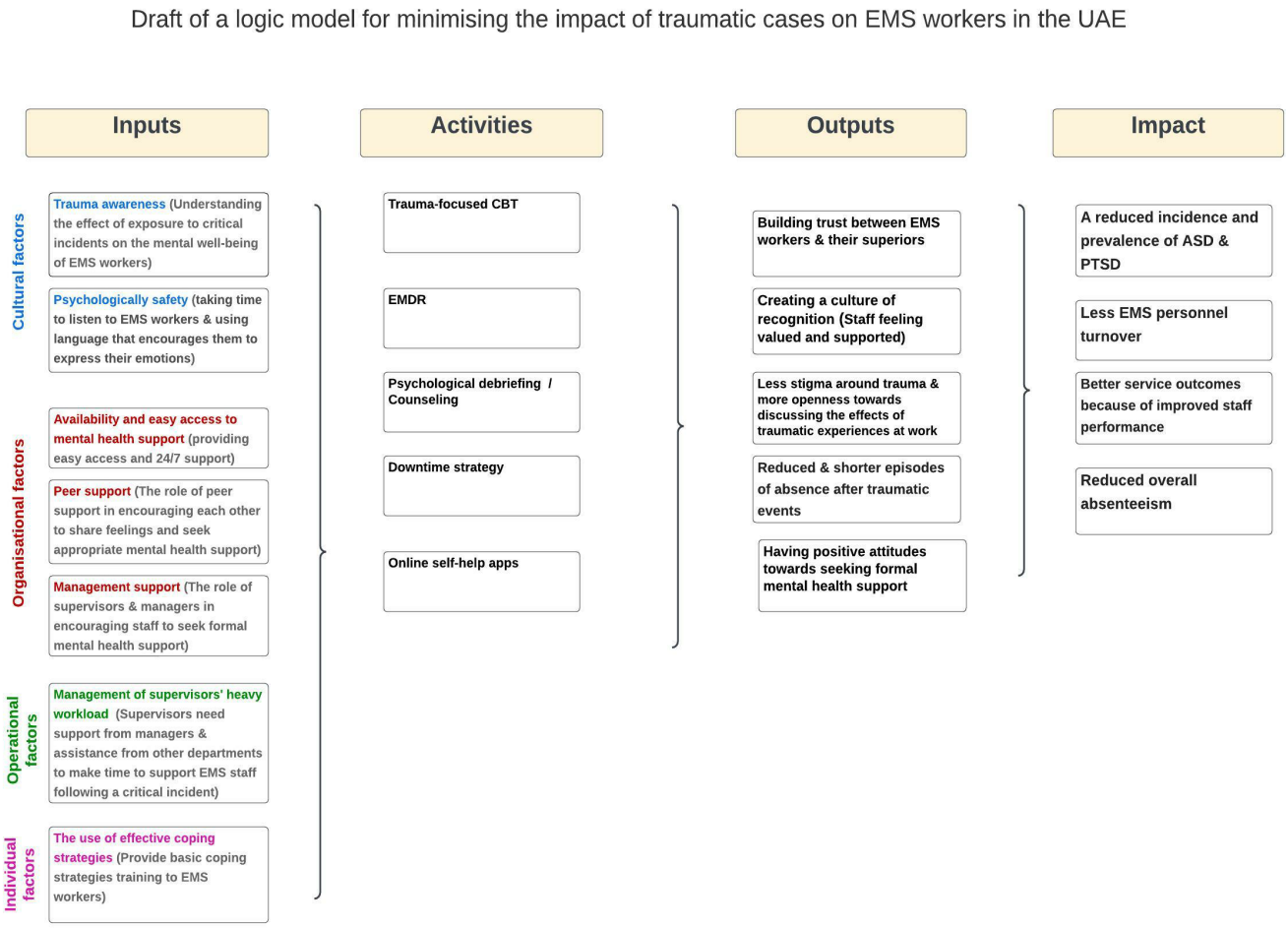


Figure 7: the logic model for minimising the impact of traumatic cases on EMS workers in the UAE.

Inputs

The model begins with the inputs, which are factors that support the delivery of effective interventions, as stated earlier. The reason for starting with these factors is that data from interviewing frontline staff and their supervisors revealed that certain conditions must be established when introducing any intervention to frontline employees. In particular, the data identified four relevant factors: cultural, organisational, operational and individual factors, which are explained below.

Cultural factors

Cultural factors included psychological safety and the level of awareness about post-traumatic stress, which are both fundamental in reducing the stigma associated with mental health trauma

and increasing the likelihood of EMS staff seeking psychological support. In a psychologically safe workplace, staff feel comfortable engaging in discussions and constructive arguments and taking risks without fear of being rejected by co-workers (Edmondson, 1999). In addition, workers can participate in open conversations in a psychologically safe workplace, voicing their concerns and asking for feedback from others (Pearsall and Ellis, 2011).

Along with protecting the staff's privacy comes another significant factor that was underscored by the participants: trust. Creating a psychologically safe environment involves making staff feel they can trust the person who is providing help (whether a supervisor or professional mental health specialist).

Concerning the level of organisational awareness, data from the interviews suggested the need for trained supervisors who are knowledgeable in identifying and assisting EMS workers experiencing post-traumatic stress reactions. Furthermore, some responses from interviewing frontline staff and supervisors revealed the need for employees from other departments (such as the HR department) to recognise the difficulty of dealing with traumatic events. Promoting awareness in other departments about the effect of such events on the mental well-being of EMS workers, as well as emphasising the need for support, is essential. Therefore, it is anticipated that the employer's future commitment to train supervisors should bring a change because supervisors will be able to provide early psychological support to staff if needed.

The management's expectation that individuals in male-dominated vocations should handle major crises without seeking psychological help is indicative of another cultural barrier. For instance, even when formal interventions are accessible within an organisation, this barrier may discourage EMS workers from seeking professional mental health support. Therefore, the organisation's level of awareness and knowledge about post-traumatic stress represents a cultural factor that contributes to the effectiveness of interventions. The logic model builds upon the probability that educating staff, especially managers, about post-traumatic stress and its signs and symptoms would help to normalise the behaviour of EMS workers exposed to traumatic incidents. Furthermore, educational content can foster greater understanding and awareness regarding the challenging role that EMS workers must play. This development would be a step towards overcoming the stigma surrounding seeking help after encountering a critical incident, tacitly encouraging staff to seek support. Thus, the initiative can be anticipated to eventually lead to fewer absences from work due to mental health problems.

Organisational factors

In creating a suitable setting in which interventions can be effectively delivered to staff, organisational factors come into play. These factors include the availability and accessibility of mental health support alongside support provided by peers, managers and supervisors. Many participants highlighted the need for the provision of easy-access mental health support with 24-hour availability that staff can access from any location and in any situation. Some participants asserted that those who have undergone traumatic events should have the opportunity to seek professional support within the first 24 hours. Having the option to seek support following a traumatic event would seem to assure staff that mental health support will be available to them should they require it, according to the interviews' data. Immediate access to mental health support would benefit those who felt the need to seek support immediately as well as those who might want some time to process the situation, assuring them that support is available when they need it.

Regarding peer support, interviewees' responses indicated that EMS workers particularly foreign workers, need support from their colleagues to cope with emotionally trying situations. The EMS workers in this study indicated that they would be more likely to confide in their peers (working in the same shift) than in other personnel. In addition, participants noted the benefit of having supportive management and its contribution to a psychologically safe culture. Analysis of the interviewees' responses suggested that management's acknowledgement of the team's hard work and recognition of the difficulty of the job may serve as a kind of managerial support towards the mental well-being of EMS workers. This practice allows for a space to safely have a conversation about traumatic situations at work without fear of being labelled or jeopardising one's career.

Additionally, the study results revealed that it is essential for supervisors to gather with their staff and take their input and opinions regarding potential actions to support their mental well-being, and then communicate feedback to the top management. As part of proposing a ToC here, it is assumed that this approach could make staff feel appreciated and that their views and thoughts are considered. In the medium term, managers and supervisors should evaluate whether EMS workers value the mental health services currently offered and consider how the former may be helping the latter to better cope with post-traumatic stress.

Operational factors

Supervisors stated that they need additional support from upper management to assist distressed staff following a critical incident. Most supervisors pointed to their heavy workload (including a

high level of administrative duties), which they described as a barrier to providing mental health support to their staff. The mental health of the EMS staff is a collective responsibility, and assistance from other departments added to that from top management is crucial, according to supervisors. Therefore, managers should review and evaluate the responsibilities included in the role of supervisors and ensure that staff from other departments are tasked to assist supervisors in fulfilling the required administrative tasks. In turn, such support can liberate time for supervisors to provide the necessary mental health support to their staff members following a traumatic incident.

Individual factors

EMS personnel should increase their knowledge of effective coping strategies and the available sources of support offered by their employer. Being informed about the types of support available and access methods might facilitate the process of seeking formal help, especially for those who are experiencing symptoms. In addition, their learning basic coping mechanisms in facing traumatic situations could help reduce the risk of ASD or PTSD.

In this regard, frontline staff and supervisors expressed widespread consensus about the value of employing an online self-help app to help them manage post-traumatic stress reactions and enable them to connect with professional mental health care. According to various participants, using an online self-help app could make individuals more cognisant of effective coping strategies and the possibility that they might require professional mental health assistance. Nevertheless, studies in the systematic literature review did not indicate that using an online self-help application reduced symptoms of PTSD.

Activities

The second column in the model lists interventions, consisting of treatment methods (CBT and EMDR) whose effectiveness has been demonstrated in the treatment of PTSD symptoms (as discussed in Chapter 3). Other interventions in the list were: debriefing, providing downtime, and using a self-help app. Although these interventions did not show a significant effect on reducing post-traumatic stress (in fact, debriefing possibly worsens symptoms), they can be tailored to be more effective when implemented.

For instance, psychological debriefings should be conducted by trained supervisors within a small group of EMS personnel who have a sense of unity. Supervisors could encourage staff to speak up by taking the lead and discussing distressing cases (especially major cases with their units).

This concept is supported by Wu *et al.* (2012), who found that incorporating cohesion training with CISD allowed soldiers to experience feelings of belonging and enhanced the shared sense of social support, which ultimately helped reduce their PTSD symptoms. According to the authors, the sense of unity between employees plays a vital role in their mental well-being because it elevates their trust in each other.

Downtime was the first intervention suggested by most frontline staff. However, downtime did not show significant effectiveness in reducing PTSD symptoms. It could be tailored in a way that helps affected staff to connect with their peers or supervisors (as an opportunity for peer support) or seek external online counselling provided by the organisation (if an employee felt the need to speak with a specialist). Staff might benefit from downtime to recognise their thoughts and feelings, which helps in processing them. Halpern *et al.* (2009) established the benefit of having time to recover after a critical incident by allowing EMS workers to explore and identify their own feelings and thoughts about the incident. According to the authors, although expressing emotions had no effect on the level of PTSD symptoms, identifying emotions was correlated with a reduction in PTSD symptoms. A significant challenge of this intervention is that providing downtime is highly dependent on staff availability and staff shortages. But a short period of downtime (roughly one hour) could help without having a significant effect on staff availability. Halpern *et al*. (2014) argued that the optimal duration of downtime is less than a day because it helps individuals to process their feelings and thoughts instead of avoiding them.

When it comes to using a self-help app (such as the SUPPORT Coach app), research conducted among EMS dispatchers demonstrated its effectiveness in reducing PTSD symptoms. Findings indicated that using it for a period of one month could significantly reduce the severity and symptoms of PTSD. Authors pointed out that elements included in the app (e.g. psychoeducation and information about sources of support) helped dispatchers self-manage indicators, which prevented them from developing more severe symptoms. Implementing an app intervention needs consistency of use. Results should be assessed after a month to check whether it is beneficial to the users and see if anything could be done to better tailor it to the needs of the EMS workers.

For this reason, these interventions were included because they represent activities that should be provided to participants as a potential method of reducing post-traumatic stress reactions and preventing individuals from experiencing the acute onset of more severe reactions

Moreover, it is worth noting that although the findings from the systematic review indicate that both debriefings and the self-help app did not correlate positively with reduction if symptoms of post-traumatic stress (while debriefing could lead to worse symptoms), these interventions were nonetheless included in the activities section because results from frontline staff interviews revealed that these interventions could be effective if certain, enabling considerations (inputs) related to treatment setting, as mentioned above, were considered (e.g. psychological safety, management support to allow time away from work to attend sessions). Therefore, it is essential for these activities to entail the enabling considerations that would potentially make them to be acceptable by frontline staff. For instance, the organisation should ensure that, upon debriefing by supervisors, a space is provided for staff to discuss the psychological aspects of dealing with critical incidents. Additionally, as recommended by frontline staff and some supervisors, this should not include personnel from other departments or services, such as police officers, as a more closed environment would make staff feel more open and comfortable discussing their post-traumatic stress reactions, thereby avoiding fear of misjudgement.

Regarding counselling, the organisation should provide resources in the form of professional counsellors and funds. The provision of counsellors could be accomplished through bond contracts with other private mental health services. This could be a step towards adequately supporting staff, as many frontline staff have emphasised the need for a knowledgeable professional who can help them with their needs following traumatic cases. Also, as supervisors noted, the provision of mental health professionals could help to identify those who need immediate help.

The provision of the different activities is related to the evidence that individuals experience post-traumatic stress differently, as not everyone shows the same symptoms or severity. The different proposed activities (interventions) correspond to the distribution of types of post-traumatic stress among this study's sample. In brief, EMS staff experiencing severe symptoms and those meeting the criteria for ASD or PTS could benefit from TF-CBT and EMDR therapies. Those with mild to moderate symptoms may benefit from proper debriefing or counselling. Self-help apps could also be useful for those with mild symptoms, as they could act as a preventive tool (due to their psychoeducational components).

Outputs

The third column of the logic model presents outputs that might be achieved when combining the aforementioned inputs with existing interventions that have been implemented in other settings. These outputs include:

- Establishing a culture within the organisation characterised by less stigma around discussing the effect of post-traumatic stress and more openness about the effects of traumatic experiences at work
- Generating a trusting relationship between frontline staff and superiors
- Developing a culture of recognition wherein EMS staff feel valued and supported and their mental well-being is considered fundamental to organisational success
- Having fewer and shorter absences from work

It should be noted that this section contains the same elements that are considered to be 'outcomes' in section 9.2.1.

9.2.5.4 Impact

Finally, the model illustrates the impacts, which are the objective and measurable long-term changes that can be expected if the relevant factors are considered when adapting existing interventions.

- *Reduced incidence and prevalence of ASD and PTSD*. This objective assumes that the staff can access mental health support as soon as needed (earlier intervention) and exhibit a positive attitude towards discussing traumatic experiences and seeking formal mental health (acceptable intervention). This goal could be initially assessed by examining the prevalence of post-traumatic stress symptoms among frontline staff at two or three different time points (for example, before an intervention, three months later, and then six months post-intervention).
- *Reduced and* shorter episodes of absence after traumatic events. EMS workers can be anticipated to have the confidence to ask supervisors for a downtime period or attend a debriefing session following a critical incident, as well as utilise the available services when needed. The organisation could measure this objective by evaluating the number of sick leaves taken due to mental health problems. Furthermore, management could assess the staff's level of engagement in debriefings and request supervisors to provide constructive feedback. The organisation should also consider the level of mental health

service utilisation, which is likely to reflect whether there is less stigma concerning mental health help and provide a proxy for levels of confidence in the formal sources of support.

- *Better service outcomes through improved staff performance*. This impact could be measured throughout the intervention by examining the number of returns of spontaneous circulation (ROSC) cases along with evaluating the patients' service experiences (feedback from patients/users).
- *Less turnover of EMS personnel.* This impact could be determined by measuring the number of non-national staff renewing their contract within the organisation along with the number of EMS personnel quitting their jobs.

9.3 Identifying stakeholders and facilitating factors

As discussed in chapter 4, I did not identify or consult with stakeholders because the research participants were, in effect, stakeholders. The interviews were conducted with frontline staff who directly handled critical incidents, supervisors who were directly charged with supporting frontline staff, and managers who were responsible for ensuring the implementation of policies and managing resources to achieve organisational goals.

Facilitating factors that must be in place are outlined in the inputs section of the logic model. These factors support the above-mentioned ToC. Specifically, these elements act as enablers towards achieving the desired outcomes. Notably, certain external factors are beyond control, which could influence the ToC. These factors could include the organisation's policies, employees' economic status and perceived level of support from relatives or friends.

9.4 Proposing assumptions

Data from the study extended beyond listing the barriers and facilitators in suggesting changes that should happen in UAE EMS organisations and mechanisms that might explain how overcoming these barriers can improve specific kinds of outcomes. Findings from the systematic review and qualitative interviews were assembled in the logic model to explicate the interactions between the inputs, activities and outputs. Assumptions were then developed based on this analysis regarding how these factors might contribute to the purpose of the study.

As discussed in chapter 4, the final step of creating a ToC includes proposing assumptions. These proposed assumptions carry some uncertainty; thus, they require further evidence of how they could be plausible. The assumptions that have been proposed in this endeavour are described below and compared to insights drawn from external evidence.

Assumption 1: *Training supervisors to efficiently conduct psychological debriefings can make staff feel open towards expressing their experiences about a critical incident.*

Findings from the interviews suggested that debriefings conducted in the organisation did not involve a discussion of the psychological aspects of a critical incident. Despite the role of culture and the fear of negative effects on the career prospects acting as barriers towards seeking mental health support, frontline staff emphasised the necessity of having trusted peers and supervisors with whom they might openly discuss such matters. Therefore, an assumption has been made that having skilled supervisors who can carry out debriefings following critical incidents in small groups could be beneficial in lowering the risk of developing post-traumatic stress reactions. This assumption is arguable, as the systematic literature review revealed inconsistent findings regarding the use of debriefings, with one study reporting the worsening of symptoms following debriefings.

Assumption 2: *Having a psychologically safe environment and supportive management can make staff more willing to seek CBT and EMDR.*

Findings from the systematic literature review confirmed that TF-CBT and EMDR were the most effective interventions for treating PTSD symptoms. However, data from some interviews showed some concern regarding the acceptability of interventions involving trauma processing. Despite evidence confirming the effectiveness of these therapies for the treatment of PTSD symptoms, data from the interviews showed that about half of the participants rejected the concept of trauma processing therapies. It is unclear whether this response was due to the participants not meeting the criteria for ASD or PTSD, in which case such therapies would not represent the most appropriate option.

Assumption 3: Offering downtime for staff following a critical incident (even for 30 minutes) could reduce the negative reactions experienced by staff.

Many participants emphasised the need for a time out of service following a critical case, allowing them to process their thoughts and emotions. Although evidence from the literature review did not show a significant correlation between being offered downtime and levels of post-traumatic stress, the application of this strategy could lessen the negative reactions associated with critical incidents, as various participants proposed.

Assumption 4: The application of the changes implied by the findings could lead to one group of personnel (for instance, Arab staff) having more privilege than other groups (non-Arab staff) in accessing support.

Although the logic model proposed interactions and pathways that could potentially lead to a reduced impact of critical incidents on EMS personnel, it should be noted that the intersections between the elements might create a group of EMS staff who are disadvantaged, leading to health inequality. For example, non-nationals, such as staff from the Philippines and India, might hesitate to seek help following critical incidents due to the idea that all of the supervisors represent Arab nationalities. Some frontline participants indicated that they would be more willing to discuss sensitive matters with someone from the same cultural background as they would consider the person more trustworthy.

9.5 Conclusion

Using a modified ToC approach affords a better understanding of how changes can be made to the organisation to improve the mental well-being of frontline staff. The approach helped outline the mechanisms of change that are likely to lead to the desired outcomes. The process included developing a logic model to summarise the key elements that must be considered to achieve the study's objectives. Furthermore, by achieving the intended impact, the organisations' missions to provide a higher quality of emergency care could be achieved, as well as minimising the impact of critical incidents on EMS workers. Achieving these goals would result in a healthier, more productive workforce that delivers better outcomes for patients.

CHAPTER 10: CONCLUSION AND RECOMMENDATIONS

10.1 Introduction

The work within this thesis aimed to identify the key principles that EMS organisations should consider when tailoring existing interventions for reducing or preventing post-traumatic stress of EMS personnel working in the UAE. Ideally, the identification of these principles will demonstrate how interventions could be more feasible, deliverable, and acceptable within the UAE.

The research began with a narrative literature review to highlight the main concepts surrounding post-traumatic stress as well as the outcomes associated to exposure to critical incidents among EMS personnel. Findings demonstrated the issues that contribute to post-traumatic stress and the effect of exposure to critical incidents on the EMS and other healthcare professionals. The research then followed with a systematic literature review evaluating the effectiveness of worldwide interventions to reduce post-traumatic stress in EMS personnel. Findings from the systematic review revealed that TF-CBT and EMDR were the most effective interventions to treat PTSD in EMS personnel.

A qualitative research design was then carried out among EMS workers, supervisors, and managers in the UAE with the purpose of understanding the underlying elements that should be taken into consideration when tailoring interventions aimed at mitigating and preventing post-traumatic stress among EMS workers. The interviews' data showed that all EMS workers need additional support to manage adverse reactions resulting from critical incidents, and that post-traumatic stress exists on a continuum; not everyone has the same level of mental health vulnerability. Therefore, a set of interventions should be provided to frontline staff that could ease or prevent reactions following a critical incident.

Moreover, debriefings conducted by supervisors was mainly focused on the procedural aspects of critical incidents, neglecting the psychological effect of these incidents on EMS workers. Although the two organisations do not differ in their respective managerial approaches, there is a marked difference between the respective perceptions of supervisors and managers regarding mental health support for frontline staff. Supervisors recognise that dealing with critical incidents may trigger post-traumatic stress reactions, with mental health intervention potentially being necessary to support staff as they recover. On the other hand, managers expected EMS personnel to develop resilience independently and adjust to their difficult working conditions.

The use of the ToC approach provided a deeper understanding of how the study is intended to

minimise the impact of critical incidents on the mental well-being of EMS staff. This approach also helped outline the mechanisms of change that are likely to lead to the desired outcomes. The integrated ToC and the logic model aided in understanding the key elements that should be considered when tailoring interventions, along with the barriers and facilitators that affect staff attitudes towards seeking and accessing mental health support.

ToC was a useful tool to understand the mechanisms and stages by which change occurs within the organisation, in order to achieve better mental health outcomes for frontline staff following exposure to traumatic cases. This will, in turn, help to mitigate the risk of staff members developing adverse mental health conditions and support them in remaining employed.

The thesis contributed new understandings about EMS perspectives and experiences on the implementation and effectiveness of interventions, which were previously undocumented and unrecognised. It also provided recommendations regarding potential strategies for providing mental health assistance to support staff after critical incidents. Furthermore, in triangulating the views of frontline staff, supervisors, and managers, the thesis provides a cohesive overview of the issue of psychological support following critical incidents and the effect of these incidents on the mental well-being of EMS in the UAE.

This concluding chapter begins with an overview of the study's strengths and limitations and ends with the recommendations for future researchers and policy makers.

10.2 The study's strengths and limitations

Employing a modified ToC approach and the production of a logic model is one of the study's main strengths. This is because of the complex dimensional nature of post-traumatic stress effect, in which findings revealed that everyone is affected to varying degrees (along a spectrum), and over time. Therefore, the use of the ToC and the logic model fits well with the factors that shape peoples' willingness to seek mental health support and the types of changes that could improve the effectiveness of tailored interventions.

While the small sample size and selection bias were study limitations, another important limitation was the small amount of evidence in the literature review (Chapter 3) regarding interventions for EMS personnel dealing with post-traumatic stress. Findings supported the treatment for PTSD using TF-CBT and EMDR, however the evidence did not extend to explaining the types of interventions that may benefit people with mild symptoms or ASD, nor the mechanisms of these interventions.

10.3 Recommendations

10.3.1 Recommendations for future research

- Test the hypotheses that have been made (in chapter 9) regarding the changes that need to happen in the service to minimise the effect of traumatic events on EMS personnel.
- Obtain information on the advantages of different methods of research and how to combine them within a study.
- Conduct the study in other parts of the world to understand a diversity of viewpoints and maximise the evidence base.
- Include EMS workers with more severe and profound symptoms of post-traumatic stress or other mental health problems to better understand what sources of help may benefit them most and identify the challenges they face when seeking help.
- Include more female and non-Arab EMS staff in different geographical contexts within the UAE to establish whether there are any gender differences or inequalities in seeking or accessing support.
- Gather the viewpoints of other healthcare professionals, such as mental health clinicians or occupational therapists from different parts of the world in order to strengthen the evidence base.
- Gather the input of families and spouses of EMS workers on health care utilization and barriers and whether they require support to help EMS workers with their mental health.
- Gather epidemiological data on post-traumatic stress among EMS personnel in the UAE, as there is a scarcity of information this issue.
- Gather data on the prevalence and occurrence of different types of mental illnesses among EMS workers in the UAE. Such information would help to more accurately represent this group's mental health needs in the quest to formulate acceptable and suitable services for workers.
- Address ideas for overcoming barriers to mental health services using the logic model represented in chapter 9. The logic model could serve as a basis for EMS organisations when planning and implementing an intervention for frontline staff.

- Conduct empirical research to identify the benefits of different existing interventions or management approaches and assess which interventions are best suited to reduce the impacts of critical incidents on EMS personnel.

10.3.2 Recommendations for clinical care and policy

- Managers should initiate a significant cultural shift in their organisations to reduce the stigma associated with seeking mental health support. An environment of psychological safety is necessary to eliminate the stigma attached to seeking assistance. Such a culture shift can help workers recognise that stress in the EMS workplace is common and can appear even after incidents that might not appear overtly traumatic.
- Greater efforts are needed to improve mental health awareness and education to prepare current and future EMS leaders to provide the needed care for frontline workers, especially foreign workers. Policies shall aim at reducing inequality in accessing mental health support following a critical incident. Moreover, increasing awareness influences the attitudes and behaviors of the organisation's leaders and employees towards the concept of mental health and seeking help.
- Supervisors need to gain competence in identifying and communicating with affected EMS personnel following a critical incident in order to provide early psychological support. Early support could reduce worsening of post-traumatic stress symptoms, thus reducing the risk of severe psychological problems such as PTSD.
- There is a need for mental health policies for emergency services workers in the UAE to protect the career prospects for those who seek mental health services. Such policies should aim at improving the mental wellbeing of the workers along with safeguarding them in case advanced mental health services are needed.
- Organizations should aim to enhance the sense of belonging among EMS personnel, because they rely on one another for support in times of need.

BIBLIOGRAPHY

Abbaspour, S. *et al*. (2020) 'Prevalence and correlates of mental health status among pre-hospital healthcare staff', *Clinical Practice and Epidemiology in Mental Health*, 16, p. 17.

Abu-Baker, K. (2005) 'The impact of social values on the psychology of gender among Arab couples: A view from psychotherapy', *Israel Journal of Psychiatry and Related Sciences*, 42(2), p. 106.

Adler, A. (1927) 'Individual psychology', *Journal of Abnormal and Social Psychology*, 22(2), pp. 116–122. https://doi.org/10.1037/h0072190

Adriaenssens, J., de Gucht, V. and Maes, S. (2012) 'The impact of traumatic events on emergency room nurses: findings from a questionnaire survey', *International Journal of Nursing Studies*, 49(11), pp. 1411–1422. https://doi.org/10.1016/j.ijnurstu.2012.07.003

Aggarwal, S. *et al.* (2021) 'Psychosocial interventions for self-harm in low-income and middle-income countries: systematic review and theory of change', *Social Psychiatry and Psychiatric Epidemiology*, 56(10), pp. 1729–1750.

Aiken, L. H. *et al.* (2002) 'Hospital nurse staffing and patient mortality, nurse burnout, and job dissatisfaction', *JAMA,* 288(16), pp. 1987–1993. https://doi.org/10.1001/jama.288.16.1987

Ajzen, I. (1991) 'The theory of planned behavior', *Organizational Behavior and Human Decision Processes*, 50(2), pp. 179–211.

Alaqeel, M. K. *et al.* (2019) 'Post-traumatic stress disorder among emergency medical services personnel: a cross-sectional study', *Asian Journal of Medical Sciences*, 10(4), pp. 28–31.

Al Enazi, S. K. and Al Enzie, A. N. (2018) 'Stress and burnout among red crescent paramedic ambulance workers in Riyadh', *Integrative Trauma and Emergency Medicine*, 6, pp. 2–10.

Al-Darmaki, F. R. (2003) 'Attitudes towards seeking professional psychological help: What really counts for United Arab Emirates university students?', *Social Behavior and Personality*, 31(5), pp. 497–508. https://doi.org/10.2224/sbp.2003.31.5.497

Al-Darmaki, F. R. (2011) 'Needs, attitudes toward seeking professional help, and preferred sources of help among Emirati college students', *Journal for International Counselor Education*, 3, pp. 39–57.

Alden, L. E. *et al.* (2021) 'Systematic literature review of psychological interventions for first responders', *Work and Stress*, 35(2), pp. 193–215. https://doi.org/10.1080/02678373.2020.1758833

Alexander, D. A. and Klein, S. (2001) 'Ambulance personnel and critical incidents impact of accident and emergency work on mental health and emotional well-being', *British Journal of Psychiatry*, 178, pp. 76–81.

Alshahrani, K. M. *et al.* (2022) 'The effectiveness of psychological interventions for reducing PTSD and

psychological distress in first responders: A systematic review and meta-analysis', *PLoS One*, *17*(8), e0272732.

American Psychiatric Association (2013) *The diagnostic and statistical manual of mental disorders.* 5th edn. Washington: American Psychiatric Association.

Amos, T., Stein, D. J. and Ipser, J. C. (2014) 'Pharmacological interventions for preventing post-traumatic stress disorder (PTSD),' *Cochrane Database of Systematic Reviews*, 7, pp. 1–51. https://doi.org/10.1002/14651858.CD006239.pub2

Anderson, A. A. (2020) *The Community Builder's Approach to ToC, a practical guide to theory development.* London: Aspen Institute.

Anderson, R. (2008) 'New MRC guidance on evaluating complex interventions', *British Medical Journal,* 337, pp. a1937–a1937. https://doi.org/10.1136/bmj.a1937

Anderson, G. S. *et al*. (2022) 'Self-reported coping strategies for managing work-related stress among public safety personnel', *International Journal of Environmental Research and Public Health*, 19(4), p. 2355.

Antony, J. *et al.* (2020) 'Interventions for the prevention and management of occupational stress injury in first responders: a rapid overview of reviews', *Systematic Reviews*, 9(1), pp. 1–20.

Arab Academy (2017) *Arabic customs and traditions*. Available at: https://www.arabacademy.com/arabic-customs-traditions/ (Accessed: 29 April 2022).

Arnold, D. *et al.* (2005) 'Vicarious posttraumatic growth in psychotherapy', *Journal of Humanistic Psychology*, 45(2), pp. 239–263.

Aromatario, O. *et al.* (2019) 'Using theory of change to develop an intervention theory for designing and evaluating behavior change SDApps for healthy eating and physical exercise: the OCAPREV theory', *BMC Public Health*, 19(1), pp. 1–12.

Asenahabi, B. (2019) 'Basics of research design: a guide to selecting appropriate research design', *International Journal of Contemporary Applied Researches,* 6(5), pp. 76–89.

Auth, N. M. *et al.* (2022) 'Mental health and help seeking among trauma-exposed emergency service staff: a qualitative evidence synthesis', *BMJ Open*, 12(2), e047814.

Austin, C. L., Pathak, M. and Thompson, S. (2018) 'Secondary traumatic stress and resilience among EMS', *Journal of Paramedic Practice,* 10(6), pp. 240–247.

Avraham, N., Goldblatt, H. and Yafe, E. (2014) 'Paramedics' experiences and coping strategies when encountering critical incidents', *Qualitative Health Research*, 24(2), pp. 194–208. https://doi.org/10.1177/104973231351986

Badrī, M. (1979) *The dilemma of Muslim psychologists*. Kuala Lumpur: Islamic Book Trust.

Baker, S. E., Edwards, R. and Doidge, M. (2012) 'How many qualitative interviews is enough? Expert

voices and early career reflections on sampling and cases in qualitative research', *Review Paper, National Centre for Research Methods*. Available at: http://eprints.brighton.ac.uk/11632/1/how_many_interviews.pdf (Accessed: 7 November 2022).

Baker, T. B., McFall, R. M. and Shoham, V. (2008) 'Current status and future prospects of clinical psychology: Toward a scientifically principled approach to mental and behavioral health care', *Psychological Science in the Public Interest*, 9(2), pp. 67–103.

Barr, J. K. and Steinberg, M.K. (1983) 'Professional participation in organizational decision making: Physicians in HMOs', *Journal of Community Health*, 8(3), pp. 160–173.

Barrera Jr, M. *et al.* (2013) 'Cultural adaptations of behavioral health interventions: a progress report', *Journal of Consulting and Clinical Psychology*, 81(2), p. 196.

Basson, H. A. and Roets, L. (2013) 'Workplace wellness for HIV/AIDS-affected nurses in South Africa', *British Journal of Nursing*, 22(1), pp. 38–44. https://doi.org/10.12968/bjon.2013.22.1.38

Baumann, A. A. *et al.* (2015) 'Cultural adaptation and implementation of evidence-based parent-training: A systematic review and critique of guiding evidence', *Children and Youth Services Review*, 53, pp.113–120.

Bauwens, J. and Tosone, C. (2010) 'Professional posttraumatic growth after a shared traumatic experience: Manhattan clinicians' perspectives on post-9/11 practice', *Journal of Loss and Trauma*, 15(6), pp. 498–517. https://doi.org/10.1080/15325024.2010.519267

Baxter, S. K. *et al.* (2014) 'Using logic model methods in systematic review synthesis: describing complex pathways in referral management interventions', *BMC Medical Research Methodology*, 14(1), pp. 1–9.

Bennett, P. *et al.* (2004) 'Levels of mental health problems among UK emergency ambulance workers', *Emergency Medicine Journal*, 21(2), pp. 235–236. https://doi.org/10.1136/emj.2003.005645

Bennett, P. *et al.* (2005) 'Associations between organizational and incident factors and emotional distress in emergency ambulance personnel', *The British Journal of Clinical Psychology*, 44(Pt 2), pp. 215–226. https://doi.org/10.1348/014466505X29639

Berger, W. *et al.* (2007) 'Partial and full PTSD in Brazilian ambulance workers: prevalence and impact on health and on quality of life', *Journal of Traumatic Stress*, 20(4), pp. 637–642.

Berger, W. *et al.* (2012) 'Rescuers at risk: a systematic review and meta-regression analysis of the worldwide current prevalence and correlates of PTSD in rescue workers', *Social Psychiatry and Psychiatric Epidemiology*, 47(6), pp. 1001–1011. https://doi.org/10.1007/s00127-011-0408-2

Berkhof, H. (1920) *Christian faith: an introduction to the study of the faith*. Michigan: Wm. B. Eerdmans Publishing.

Bernal, G. and Scharrón-del-Río, M. R. (2001) 'Are empirically supported treatments valid for ethnic

minorities? Toward an alternative approach for treatment research,' *Cultural Diversity and Ethnic Minority Psychology*, 7, pp. 328–342.

Bernard, H. R. (2002) *Research methods in anthropology: Qualitative and quantitative approaches*. 3rd edn. New York: Alta Mira Press.

Betancourt, H. and López, S. R. (1995) 'The study of culture, ethnicity, and race in American psychology', in Goldberger, N. R. and Veroff, J. B. (eds.) *The culture and psychology reader*. New York: New York University Press, pp. 87–107.

Birney, A. J. *et al.* (2016) 'MoodHacker mobile web app with email for adults to self-manage mild-to-moderate depression: randomized controlled trial', *JMIR Mhealth and Uhealth*, 4(1), e4231. https://doi.org/10.2196/mhealth.4231

Bledsoe, B. E. (2003) 'A critical incident stress management (CISM): Benefit or risk for emergency services?', *Prehospital Emergency Care,* 7(2), pp. 272–279.

Boddy, C. R. (2016) 'Sample size for qualitative research', *Qualitative Market Research: An International Journal,* 19(4), pp. 426–432. https://doi.org/10.1108/QMR-06-2016-0053

Boland, L. L. *et al.* (2018) 'Burnout and exposure to critical incidents in a cohort of emergency medical services workers from Minnesota', *The Western Journal of Emergency Medicine*, 19(6), pp. 987–995. https://doi.org/10.5811/westjem.8.39034

Boland, L. L. *et al.* (2019) 'Social support outside the workplace, coping styles, and burnout in a cohort of EMS providers from Minnesota', *Workplace Health and Safety*, 67(8), pp. 414–422. https://doi.org/10.1177/2165079919829154

Boudreaux, E. and C. Mandry (1996) 'The effects of stressors on emergency medical technicians (Part II): A critical review of the literature, and a call for further research', *Prehospital and Disaster Medicine,* 11(4), pp. 302–307.

Bowen, D. J. *et al.* (2009) 'How we design feasibility studies', *American Journal of Preventive Medicine*, 36(5), pp. 452–457. https://doi.org/10.1016/j.amepre.2009.02.002

Boyle, M. *et al.* (2007) 'A pilot study of workplace violence towards paramedics', *Emergency Medicine Journal*, 24(11), pp. 760–763. https://doi.org/10.1136/emj.2007.046789

Braun, V. and Clarke, V. (2006) 'Using thematic analysis in psychology', *Qualitative Research in Psychology*, 3(2), pp. 77–101. https://doi.org/10.1191/1478088706qp063oa

Breslau, N., Lucia, V. C. and Davis, G.C. (2004) 'Partial PTSD versus full PTSD: an empirical examination of associated impairment', *Psychological Medicine*, 34(7), pp. 1205–1214.

Breuer, E. *et al.* (2014) 'Using workshops to develop theories of change in five low and middle income countries: lessons from the programme for improving mental health care (PRIME)', *International Journal of Mental Health Systems*, 8(1), pp. 1–13.

Breuer, E. *et al.* (2016) 'Planning and evaluating mental health services in low-and middle-income countries using theory of change', *The British Journal of Psychiatry*, 208(s56), pp. s55–s62.

Breuer, E., Silva, D. and Lund, C. (2018) 'Theory of change for complex mental health interventions: 10 lessons from the programme for improving mental healthcare', *Global Mental Health*, 5(24), pp. 1–10.

Brewin, C. R., Andrews, B. and Valentine, J. D. (2000) 'Meta-analysis of risk factors for posttraumatic stress disorder in trauma-exposed adults', *Journal of Consulting and Clinical Psychology,* 68(5), pp. 748–766. https://doi.org/10.1037//0022-006X.68.5.748

Britt, T. W. and McFadden, A. C. (2012) 'Understanding mental health treatment seeking in high stress occupations', *Contemporary Occupational Health Psychology: Global Perspectives on Research and Practice*, 2, pp. 57–73.

Brown, W. J. *et al.* (2018) 'A critical review of negative affect and the application of CBT for PTSD', *Trauma, Violence, and Abuse*, 19(2), pp. 176–194.

Bryant, R. A. (2017) 'Acute stress disorder', *Current Opinion in Psychology*, 14, pp. 127–131. https://doi.org/10.1016/j.copsyc.2017.01.005

Bryant, R. A. *et al.* (2019) 'Efficacy of exposure-based cognitive behaviour therapy for post-traumatic stress disorder in emergency service personnel: a randomised clinical trial', *Psychological Medicine*, 49(9), pp. 1565–1573.

Bryant-Davis, T. (2019) 'The cultural context of trauma recovery: considering the posttraumatic stress disorder practice guideline and intersectionality', *Psychotherapy*, 56(3), pp. 400–408. https://doi.org/10.1037/pst0000241

Bryman, A. (2004) *Social research methods, 2nd edition*. Oxford: Oxford University Press.

Bryman, A. (2016) *Social research methods, 5th edition*. Oxford: Oxford University Press.

Buljan, N. (2015) *Burden of posttraumatic stress disorder (PTSD) – health, social, and economic impacts of exposure to the London bombings*. PhD thesis. The London School of Economics and Political Science. Available at: http://etheses.lse.ac.uk/3274/ (Accessed: 7 November 2022).

Burrow-Sánchez, J. J., Minami, T. and Hops, H. (2015) 'Cultural accommodation of group substance abuse treatment for Latino adolescents: Results of an RCT', *Cultural Diversity and Ethnic Minority Psychology*, 21(4), p. 571.

Busetto, L., Wick, W. and Gumbinger, C. (2020) 'How to use and assess qualitative research methods', *Neurological Research and Practice*, 2(1), pp. 1–10.

Cahill, S. P. and Pontoski, K. (2005) 'Post-traumatic stress disorder and acute stress disorder I: their nature and assessment considerations', *Psychiatry,* 2(4), pp. 14–25.

Caine, R. and Ter-Bagdasarian, L. (2003) 'Early identification and management of critical incident stress',

Critical Care Nurse, 23(1), pp. 59–65.

Calhoun, L. *et al.* (2010) 'Positive outcomes following bereavement: Paths to posttraumatic growth', *Psychologica Belgica*, 50(1–2), pp. 125–143. https://doi.org/10.5334/pb-50-1-2-125

Caldwell, D. M. and Welton, N. J. (2016) 'Approaches for synthesising complex mental health interventions in meta-analysis', *Evidence-Based Mental Health*, 19(1), p. 16. https://doi.org/10.1136/eb2015102275

Campbell, M. *et al.* (2020a) 'ADAPT study: adaptation of evidence-informed complex population health interventions for implementation and/or re-evaluation in new contexts: protocol for a Delphi consensus exercise to develop guidance', *BMJ Open*, 10(7), e038965. https://doi.org/10.1136/bmjopen-2020-038965

Campbell, M. *et al.* (2000b) 'Framework for design and evaluation of complex interventions to improve health', *BMJ*, *321*(7262), pp. 694–696. https://doi.org/10.1136/bmj.321.7262.694

Campfield, K. M. and Hills, A. M. (2001) 'Effect of timing of critical incident stress debriefing (CISD) on posttraumatic symptoms', *Journal of Traumatic Stress,* 14(2), pp. 327–340.

Carleton, R. N. *et al.* (2018) 'Mental disorder symptoms among public safety personnel in Canada,' *The Canadian Journal of Psychiatry*, 63(1), pp. 54–64.

Caruso, J. and Spirrison, C. (1994) 'Early memories, normal personality variation, and coping', *Journal of Personality Assessment*, 63(3), pp. 517–533.

Castro, F. G., Barrera, M. and Holleran Steiker, L. K. (2010) 'Issues and challenges in the design of culturally adapted evidence-based interventions', *Annual Review of Clinical Psychology*, 6(1), pp. 213–239. https://doi.org/10.1146/annurev-clinpsy-033109-132032

Chao, G. T. and Moon, H. (2005) 'The cultural mosaic: A metatheory for understanding the complexity of culture', *Journal of Applied Psychology*, 90(6), pp. 1128–1140. https://doi.org/10.1037/0021-9010.90.6.1128

Charmaz, K. (2001). 'Grounded theory'. In R. M. Emerson (Ed.), Contemporary field research: Perspectives and formulations (2nd ed., pp. 335–352). Waveland Press.

Cheng, H. L. *et al.* (2018) 'Self-stigma, mental health literacy, and attitudes toward seeking psychological help', *Journal of Counseling and Development*, 96(1), pp. 64–74.

Chowdhary, N. *et al.* (2014) 'The methods and outcomes of cultural adaptations of psychological treatments for depressive disorders: a systematic review', *Psychological Medicine*, 44(6), pp. 1131–1146.

Cieslak, R. *et al.* (2013) 'Secondary traumatic stress among mental health providers working with the military: Prevalence and its work-and exposure-related correlates', *The Journal of Nervous and Mental Disease*, 201(11), p. 917.

Cieslak, R. *et al.* (2014) 'A meta-analysis of the relationship between job burnout and secondary traumatic stress among workers with indirect exposure to trauma', *Psychological Services*, 11(1), p. 75.

Clohessy, S. and Ehlers, A. (1999) 'PTSD symptoms, response to intrusive memories and coping in ambulance service workers', *British Journal of Clinical Psychology*, 38(3), pp. 251–265.

Clompus, S. R. and Albarran, J. W. (2016) 'Exploring the nature of resilience in paramedic practice: A psycho-social study', *International Emergency Nursing*, 28, pp. 1–7. https://doi.org/10.1016/j.ienj.2015.11.006

Cobb, S. (1979) 'Social support as a moderator of life stress', *Psychosomatic Medicine,* 38, pp. 300–314.

Cohen, S. and Wills, T. (1985) 'Stress, social support, and the buffering hypothesis', *Psychological Bulletin*, 98(2), pp. 310–357.

Connell, J. P. and Kubisch, A. C. (1998) 'Applying a ToC approach to the evaluation of comprehensive community initiatives: progress, prospects, and problems', in *New Approaches to Evaluating Community Initiatives*, *2*(1544), pp. 1–16.

Copeland, L. *et al.* (2021). 'The what, why and when of adapting interventions for new contexts: A qualitative study of researchers, funders, journal editors and practitioners' understandings', *PLoS One*, 16(7), e0254020.

Coryn, C. L. *et al.* (2011) 'A systematic review of theory-driven evaluation practice from 1990 to 2009', *American Journal of Evaluation*, 32(2), pp. 199–226.

Craig, P. *et al.* (2013) 'Developing and evaluating complex interventions: the new Medical Research Council guidance', *International Journal of Nursing Studies*, 50(5), pp. 587–592. https://doi.org/10.1016/j.ijnurstu.2012.09.010

Creswell, J. W. (2009) *Research design: Qualitative, quantitative, and mixed methods approaches*. 3rd edn. Thousand Oaks: Sage Publications.

Creswell, J. (2014) *Research design Qualitative, Quantitative, and Mixed Methods Approach*. 4th ed. London: Sage Publications.

Creswell, J. W. and Plano Clark, V. L. (2011) *Designing and conducting mixed methods research.* 2nd edn. Thousand Oaks: Sage.

Crowe, R. P. *et al.* (2018) 'Association of burnout with workforce-reducing factors among EMS professionals', *Prehospital Emergency Care*, 22(2), pp. 229–236.

Cukor, J. *et al.* (2009) 'Emerging treatments for PTSD', *Clinical Psychology Review*, 29(8), pp. 715–726.

Cushman, J. T. *et al.* (2010) 'Ambulance personnel perceptions of near misses and adverse events in pediatric patients', *Prehospital Emergency Care*, 14(4), pp. 477–484.

Davis C. G., Nolen-Hoeksema, S. and Larson. J. (1998) 'Making sense of loss and benefiting from the experience', *Journal of Personality and Social Psychology*, 75(2), pp. 561–574.

Davis, E. (2017) *Trauma in emergency services: a systematic review of posttraumatic growth in firefighters and an investigation into post-traumatic stress symptoms in ambulance clinicians: severity and associations with self compassion, psychological inflexibility and wellbeing*. PhD thesis. University of Edinburgh.

Davis, K. *et al.* (2019) 'Posttraumatic stress symptom severity, prevalence and impact in ambulance clinicians: The hidden extent of distress in the emergency services', *Traumatology*, 25(4), p. 282.

De Boer, J. C. *et al.* (2011) 'Work-related critical incidents in hospital-based health care providers and the risk of post-traumatic stress symptoms, anxiety, and depression: a meta-analysis', *Social Science and Medicine*, 73(2), pp. 316–326.

Declercq, F. *et al.* (2011) 'Frequency of and subjective response to critical incidents in the prediction of PTSD in emergency personnel', *Journal of Traumatic Stress*, 24(1), pp. 133–136.

Degnan, A. *et al.* (2018) 'The nature and efficacy of culturally-adapted psychosocial interventions for schizophrenia: a systematic review and meta-analysis'. *Psychological Medicine*, 48(5), pp. 714–727.

Del Ben, K. S. *et al.* (2006) 'Prevalence of posttraumatic stress disorder symptoms in firefighters', *Work and Stress*, 20(1), pp. 37–48.

DeLucia, J. A. *et al.* (2019) 'Prevalence of post-traumatic stress disorder in emergency physicians in the United States', *Western Journal of Emergency Medicine*, 20(5), p. 740.

Denzin, N. K. and Lincoln, Y. S. (2005) 'Introduction: The discipline and practice of qualitative research', in Denzin, N. K. and Lincoln, Y. S. (eds.) *The Sage handbook of qualitative research* (3rd edn). Thousand Oaks: Sage, pp. 1–32.

De Silva, M. J. *et al.* (2014) 'Theory of change: a theory-driven approach to enhance the Medical Research Council's framework for complex interventions', *Trials*, 15. https://doi.org/10.1186/1745-6215-15-267

Di Nota, P. M. *et al.* (2021) 'Coping among public safety personnel: A systematic review and meta–analysis', *Stress and Health*, 37(4), pp. 613–630.

Donnelly, E. (2012) 'Work-related stress and posttraumatic stress in emergency medical services', *Prehospital Emergency Care*, 16(1), pp. 76–85. https://doi.org/10.3109/10903127.2011.621044

Donnelly, E. and Siebert, D. (2009) 'Occupational risk factors in the emergency medical services', *Prehospital and Disaster Medicine*, 24(5), pp. 422–429. https://doi.org/10.1017/S1049023X00007251

Donnelly, E. A. (2010) *Occupationally related stress exposures and stress reactions in the emergency medical services.* PhD thesis. The Florida State University.

Donnelly, E. A. and Bennett, M. (2014) 'Development of a critical incident stress inventory for the

emergency medical services', *Traumatology: An International Journal*, 20(1), p. 1.

Donnelly, E. A. *et al*. (2016) 'Predictors of posttraumatic stress and preferred sources of social support among Canadian paramedics', *Canadian Journal of Emergency Medicine*, 18(3), pp. 205–212.

Doyle, L. *et al.* (2020) 'An overview of the qualitative descriptive design within nursing research', *Journal of Research in Nursing*, 25(5), pp. 443–455.

Drewitz-Chesney, C. (2012) 'Posttraumatic stress disorder among paramedics: Exploring a new solution with occupational health nurses using the Ottawa Charter as a framework', *Workplace Health and Safety,* 60(6), pp. 257–263. https://doi.org/10.1177/216507991206000605

Drewitz-Chesney, C. (2019) 'Exploring paramedic communication and emotional expression in the workplace after responding to emergency calls', *Australasian Journal of Paramedicine*, 16. https://doi.org/10.33151/ajp.16.714

Drissi, N. *et al.* (2022) 'A conceptual framework to design connected mental health solutions in the United Arab Emirates: Questionnaire study', *JMIR Formative Research*, 6(2), e27675.

Dubai Corporation for Ambulance Services (2023a) *History of DCAS*. Available at: https://www.ambulance.gov.ae/en-us/Pages/HistoryDCAS.aspx. (Accessed: 7 July 2020).

Dubai Corporation for Ambulance Services (2023b) *Specialized Services*. Available at: https://www.ambulance.gov.ae/en-us/Pages/specializedservices.aspx (Accessed: 19 February 2020).

Duram, L. A. (2012) 'Pragmatic study', in Salkind, N. J. (eds.) *Encyclopedia of Research Design*. Thousand Oaks: SAGE Publications, pp. 1073–1075.

Dyer, J. G. and McGuinness, T. M. (1996) 'Resilience: Analysis of the concept', *Archives of Psychiatric Nursing*, 10(5), pp. 276–282. https://doi.org/10.1016/S0883-9417(96)80036-7

Eaton, G. (2019) "Paramedic. noun," *British Paramedic Journal*, 4(2), pp. 1–3. Available at: https://doi.org/10.29045/14784726.2019.09.4.2.1.

Edmondson, A. C. (1999) 'Psychological safety and learning behavior in work teams', *Administrative Science Quarterly,* 44, pp. 350–383.

Ehlers, A. and Clark, D. M. (2000) 'A cognitive model of posttraumatic stress disorder', *Behaviour Research and Therapy*, 38(4), pp. 319–345. https://doi.org/10.1016/S0005-7967(99)00123-0

Elbarazi, I. *et al.* (2017) 'Prevalence of and factors associated with burnout among health care professionals in Arab countries: a systematic review', *BMC Health Services Research*, 17(1), pp. 1–10.

Elhai, J. D., North, T. C. and Frueh, B. C. (2005) 'Health service use predictors among trauma survivors: A critical review', *Psychological Services*, 2(1), pp. 3–19. https://doi.org/10.1037/1541-1559.2.1.3

Elhart, M. A., Dotson, J. and Smart, D. (2019) 'Psychological debriefing of hospital emergency personnel:

review of critical incident stress debriefing', *International Journal of Nursing Student Scholarship*, 6. Available at: https://jmss.org/index.php/ijnss/article/view/68395

Elyamani, R. and Hammoud, H. (2020) 'Mental health literacy of healthcare providers in Arab Gulf countries: A systematic review', *Journal of Primary Care and Community Health,* 11, 2150132720972271. https://doi.org/10.1177/2150132720972271

Engelhard, I. M. and Van Den Hout, M. A. (2007) 'Preexisting neuroticism, subjective stressor severity, and posttraumatic stress in soldiers deployed to Iraq', *The Canadian Journal of Psychiatry*, 52(8), pp. 505–509.

Eriksson, C. B., Foy, D. W. and Larson, L. C. (2004) 'When helpers need help', *Early Intervention for Trauma and Traumatic Loss*, pp. 241–256.

Evans, R. E. *et al.* (2019) 'When and how do 'effective' interventions need to be adapted and/or re-evaluated in new contexts? The need for guidance', *Journal of Epidemiology and Community Health*, 73(6), pp. 481–482.

Everly, G. S., Flannery, R. B. and Eyler, V.A. (2002) 'Critical incident stress management (CISM): A statistical review of the literature', *Psychiatric Quarterly*, 73(3), pp. 171–182.

Everly, G. S. and Mitchell, J. T. (1999) *Critical incident stress management (CISM): A new era and standard of care in crisis intervention*. 2nd edn. Ellicot: Chevron.

Fares, S. *et al.* (2014) 'Emergency medicine in the United Arab Emirates', *International Journal of Emergency Medicine*, 7(1), 4. https://doi.org/10.1186/1865-1380-7-4

Fenn, K. and M. Byrne (2013) 'The key principles of cognitive behavioural therapy', *InnovAiT,* 6(9), pp. 579–585.

Fineberg, N. A. *et al.* (2013) 'The size, burden and cost of disorders of the brain in the UK', *Journal of Psychopharmacology*, 27(9), pp. 761–770.

Firth, J. *et al.* (2017) 'Can smartphone mental health interventions reduce symptoms of anxiety? A meta-analysis of randomized controlled trials', *Journal of Affective Disorders*, 218, pp. 15–22.

Fjeldheim, C. B. *et al.* (2014) 'Trauma exposure, posttraumatic stress disorder and the effect of explanatory variables in paramedic trainees', *BMC Emergency Medicine*, 14, 11. https://doi.org/10.1186/1471-227X-14-11

Foa, E. B., Zinbarg, R. and Rothbaum, B. O. (1992) 'Uncontrollability and unpredictability in post-traumatic stress disorder: An animal model', *Psychological Bulletin*, 112(2), pp. 218–238.

Foa, E. B. et al. (1997) 'The validation of a self-report measure of posttraumatic stress disorder: the Posttraumatic Diagnostic Scale', *Psychological Assessment*, 9(4), p. 445.

Fragoso, Z. L. *et al.* (2016) 'Burnout and engagement: Relative importance of predictors and outcomes in two health care worker samples', *Workplace Health and Safety*, 64(10), pp. 479–487.

Frazier, P. *et al.* (2009) 'Does self-reported posttraumatic growth reflect genuine positive change?' *Psychological Science*, 20(7), pp. 912–919.

Fridgen, G. J. *et al.* (2013) 'Help-seeking and pathways to care in the early stages of psychosis', *Social Psychiatry and Psychiatric Epidemiology*, 48(7), pp. 1033–1043.

Froutan, R. *et al.* (2018) 'Relationship between resilience and personality traits in paramedics', *International Journal of Emergency Services*, 7(1), pp. 4–12. https://doi.org/10.1108/IJES-12-2016-0028

Fulbright-Anderson, K., Connell, J. P. and Kubisch, A. C. (eds.) (1995) *New Approaches to Evaluating Community Initiatives*, Vol. 2, London: Aspen Institute.

Fullerton, C. S., Ursano, R. J. and Wang, L. (2004) 'Acute stress disorder, posttraumatic stress disorder, and depression in disaster or rescue workers', *American Journal of Psychiatry*, 161(8), pp. 1370–1376.

Funnell, S. C. and Rogers, P. J. (2011) *Purposeful program theory: effective use of theories of change and logic models*. New Jersey: Wiley.

Gallagher, S. and McGilloway, S. (2008) 'Living in critical times: The impact of critical incidents on frontline ambulance personnel: A qualitative perspective', *International Journal of Emergency Mental Health*, 9(3), pp. 215–224.

Geuzinge, R. *et al.* (2020) 'Social embeddedness of firefighters, paramedics, specialized nurses, police officers, and military personnel: Systematic review in relation to the risk of traumatization', *Frontiers in Psychiatry*, 11, 496663.

Gioia, D. A., Corley, K. G. and Hamilton, A. L. (2013) 'Seeking qualitative rigor in inductive research: Notes on the Gioia methodology', *Organizational Research Methods*, 16(1), pp. 15–31.

Goldkuhl, G. (2012) 'Pragmatism vs interpretivism in qualitative information systems research', *European Journal of Information Systems*, 21(2), pp. 135–146.

Gómez-Gutiérrez, M. M. *et al.* (2016) 'Posttraumatic stress symptomatology in pre-hospital emergency care professionals assaulted by patients and/or relatives: Importance of severity and experience of the aggression', *Journal of Interpersonal Violence*, 31(2), pp. 339–354. https://doi.org/10.1177/0886260514555370

Gouweloos-Trines, J. *et al.* (2017) 'Perceived support at work after critical incidents and its relation to psychological distress: a survey among prehospital providers', *Emergency Medicine Journal*, 34(12), pp. 816–822. https://doi.org/10.1136/emermed-2017-206584

Gramlich, M. A. and S. M. Neer (2018) 'Firefighter-paramedic with posttraumatic stress disorder, horrific images, and depression: A clinical case study', *Clinical Case Studies,* 17(3), pp. 150–165.

Green, J. and Thorogood, N. (2009) *Qualitative methods for health research*. 2nd ed. Thousand Oaks:

Sage.

Griffin C. and Bengry-Howell, A. (2017) 'Ethnography', in: Willig, C. and Stainton Rogers, W. (eds.) *The SAGE handbook of qualitative research in psychology* (2nd edn). London: Sage Publications Ltd, pp. 38–54.

Griner, D. and Smith, T. B. (2006) 'Culturally adapted mental health intervention: A meta-analytic review,' *Psychotherapy: Theory, Research, Practice, Training*, 43(4), p. 531.

Guise, J. M. *et al.* (2017) 'Emergency medical services responders' perceptions of the effect of stress and anxiety on patient safety in the out-of-hospital emergency care of children: a qualitative study', *BMJ Open*, 7(2), e014057. https://doi.org/10.1136/bmjopen-2016-014057

Gupta, M., Shaheen, M. and Reddy, K. P. (eds.) (2018) *Qualitative techniques for workplace data analysis*. IGI Global. pp. 25–51.

Hall, L. H. *et al.* (2016) Healthcare staff wellbeing, burnout, and patient safety: A systematic review', *PloS One*, 11(7), e0159015. https://doi.org/10.1371/journal.pone.0159015

Halpern, J. *et al.* (2009a) 'Interventions for critical incident stress in emergency medical services: a qualitative study', *Stress and Health: Journal of the International Society for the Investigation of Stress*, 25(2), pp.139–149.

Halpern, J. et al. (2009b) 'What makes an incident critical for ambulance workers? Emotional outcomes and implications for intervention', Work and Stress, 23(2), pp. 173–189. https://doi.org/10.1080/02678370903057317

Halpern, J. *et al.* (2011) 'Attachment insecurity, responses to critical incident distress, and current emotional symptoms in ambulance workers', *Stress and Health*, 28(1), pp. 51–60.

Halpern, J. *et al.* (2014) 'Downtime after critical incidents in emergency medical technicians/paramedics', *BioMed Research International*, 2014, 483140. https://doi.org/10.1155/2014/483140

Hamdan, M. and Hamra, A. A. (2017) 'Burnout among workers in emergency departments in Palestinian hospitals: Prevalence and associated factors', *BMC Health Services Research*, 17(1), pp. 3–9. https://doi.org/10.1186/s12913-017-2356-3

Hammersley, M. and Traianou, A. (2012). *Ethics in qualitative research: Controversies and contexts*. Sage Publications Ltd. https://dx.doi.org/10.4135/9781473957619

Hansen, M. et al. (2010) 'PTSD-8: a short PTSD inventory', *Clinical Practice and Epidemiology in Mental Health*, 6, p. 101.

Harary, S. (2012) *CISD and crisis intervention: A qualitative study.* Doctoral dissertation. John F. Kennedy University. Available at: https://www.icisf.org/wp-content/uploads/2013/04/Crisis-Intervention-and-CISM-A-Research-Summary.pdf (Accessed: 9 November 2022).

Haugen, P. T., Evces, M. and Weiss, D. S. (2012) 'Treating posttraumatic stress disorder in first

responders: A systematic review', *Clinical Psychology Review*, 32(5), pp. 370–380.

Hazell, C. M. *et al.* (2021) 'Enhancing mental health awareness in emergency services (the ENHANcE I project): cross-sectional survey on mental health stigma among emergency services staff', *BJPsych Open*. Cambridge University Press, 7(3), e77. https://doi.org/10.1192/bjo.2021.37

Heath, P. J., Vogel, D. L. and Al-Darmaki, F. R. (2016) 'Help-seeking attitudes of United Arab Emirates students', *Counseling Psychologist*, 44(3), pp. 331–352. https://doi.org/10.1177/0011000015621149

Hennink, M. M., Hutter, I. and Bailey, A. (2011) *Qualitative research methods*. London: Sage Publications.

Herman-Stabl, M. A., Stemmler, M. and Petersen, A. C. (1995) 'Approach and avoidant coping: Implications for adolescent mental health', *Journal of Youth and Adolescence*, 24(6), pp. 649–665.

Hernandez, M. and Hodges, S. (2006) 'Applying a ToC approach to interagency planning in child mental health', *American Journal of Community Psychology*, 38(3), pp. 165–173. https://doi.org/10.1007/s1046400690797

Higgins, J. P. *et al.* (2011) 'The Cochrane Collaboration's tool for assessing risk of bias in randomised trials', *BMJ*, 343, d5928. https://doi.org/10.1136/bmj.d5928

Hiles, D., Čermák, I. and Chrz, V. (2017) 'Narrative inquiry', in Willig, C. and Rogers, W. S. (eds.) *The SAGE handbook of qualitative research in psychology*, 2nd edn. London: Sage Publications, Ltd., pp. 157–175.

Hoddinott, P. (2015) 'A new era for intervention development studies', *Pilot and Feasibility Studies,* 1(1), pp. 1–4.

Hojat, M. *et al.* (2015) 'Underlying construct of empathy, optimism, and burnout in medical students', *International Journal of Medical Education*, 6, p. 12.

Holen, A., Sund, A. and Weiseath, L. (1993) *The Alexander L Kielland disaster*. Oslo: University of Oslo.

Hood, C. and Carruthers, C. (2002) 'Coping skills theory as an underlying framework for therapeutic recreation services', *Therapeutic Recreation Journal*, 34(2), pp. 137–153.

Houghton, C. *et al.* (2017). 'From screening to synthesis: using NVivo to enhance transparency in qualitative evidence synthesis', *Journal of Clinical Nursing*, 26(5-6), pp. 873–881.

Howitt, D. (2019) *Introduction to qualitative research methods in psychology*. New York: Pearson.

In, J. (2017) 'Introduction of a pilot study', *Korean Journal of Anesthesiology*, 70(6), pp. 601–605. https://doi.org/10.4097/kjae.2017.70.6.601

Jackson, J. *et al.* (2007) 'Post-traumatic stress disorder and post-traumatic stress symptoms following critical illness in medical intensive care unit patients: assessing the magnitude of the problem', *Critical Care (London, England)*, 11(1), R27. https://doi.org/10.1186/cc5707

James, A. (1988) ‘Perceptions of stress in British ambulance personnel’, *Work and Stress*, 2/4(1), pp. 319–326.

Jarero, I. *et al.* (2013) ‘EMDR individual protocol for paraprofessional use: A randomized controlled trial with first responders’, *Journal of EMDR Practice and Research*, 7(2), pp. 55–64.

Jarero, I., Schnaider, S. and Givaudan, M. (2019) ‘Randomized controlled trial: provision of EMDR protocol for recent critical incidents and ongoing traumatic stress to first responders’, *Journal of EMDR Practice and Research*, 13(2), pp. 100–110.

Jonsson, A. and Segesten, K. (2004) ‘Guilt, shame and need for a container: a study of post-traumatic stress among ambulance personnel’, *Accident and Emergency Nursing*, 12(4), pp. 215–223.

Jones, S. (2017) ‘Describing the mental health profile of first responders: A systematic review’, *Journal of the American Psychiatric Nurses Association*, 23(3), pp. 200–214. https://doi.org/10.1177/1078390317695266

Jones, S. *et al.* (2018) ‘Prevalence and correlates of psychiatric symptoms among first responders in a Southern State’, *Archives of Psychiatric Nursing*, 32(6), pp. 828–835.

Jones, S., Agud, K. and McSweeney, J. (2019) ‘Barriers and facilitators to seeking mental health care among first responders: “Removing the Darkness”’, *Journal of the American Psychiatric Nurses Association*, 107839031987199. https://doi.org/10.1177/1078390319871997

Jonker, J. and Pennink, B. (2010) *The essence of research methodology: A concise guide for master and PhD students in management science*. Heidelberg: Springer.

Jonsson, A. and Segesten, K. (2004) ‘Daily stress and concept of self in Swedish ambulance personnel’, *Prehospital and Disaster Medicine*, 19(3), pp. 226–234.

Jonsson, A., Segesten, K. and Mattsson, B. (2003) ‘Post-traumatic stress among Swedish ambulance personnel’, *Emergency Medicine Journal*, 20(1), pp. 79–84.

Joyce, S. *et al.* (2018) ‘Mindfulness-based resilience training in the workplace: pilot study of the internet-based Resilience @ Work (RAW) mindfulness program’, *Journal of Medical Internet Research*, 20(9), e10326.

Kamena, M. and Galvez, H. (2020) ‘Intensive residential treatment program: Efficacy for emergency responders’ critical incident stress’, *Journal of Police and Criminal Psychology*, 35(1), pp. 75–81.

Kang, X. *et al.* (2018) ‘The benefits of indirect exposure to trauma: the relationships among vicarious posttraumatic growth, social support, and resilience in ambulance personnel in China’, *Psychiatry Investigation*, 15(5), p. 452.

Kangaslampi, S. and Peltonen, K. (2022) ‘Mechanisms of change in psychological interventions for posttraumatic stress symptoms: a systematic review with recommendations’, *Current Psychology*, 41(1), pp. 258–275.

Karaffa, K. M. and Koch, J. M. (2015) 'Stigma, pluralistic ignorance, and attitudes toward seeking mental health services among police officers', *Criminal Justice and Behavior,* 43(6), pp. 759–777. https://doi.org/10.1177/0093854815613103.

Kashdan, T. B. and Rottenberg, J. (2010) 'Psychological flexibility as a fundamental aspect of health', *Clinical Psychology Review*, 30(4), pp. 865–878. https://doi.org/10.1016/j.cpr.2010.03.001

Kaushik, V. and Walsh, C. (2019) 'Pragmatism as a research paradigm and its implications for social work research', *Social Sciences,* 8(9), pp. 1–17.

Kearns, M. C. *et al.* (2012) 'Early interventions for PTSD: a review', *Depression and Anxiety*, 29(10), pp. 833–842.

Kerai, S. M. *et al.* (2017) 'Post-traumatic stress disorder and its predictors in emergency medical service personnel: a cross-sectional study from Karachi, Pakistan', *BMC Emergency Medicine*, 17(1), pp. 1–7.

Kessler, R. C. (2000) 'Posttraumatic stress disorder: The burden to the individual and to society', *Journal of Clinical Psychiatry*, 61(5), pp. 412.

Khan, W. A. A. *et al.* (2020) 'Sleep and mental health among paramedics from Australia and Saudi Arabia: a comparison study', *Clocks and Sleep*, 2(2), pp. 246–257.

Khan, S. (2013) *Developing a culturally adapted cognitive behavioural therapy based intervention for British Pakistani mothers with persistent postnatal depression*. United Kingdom: The University of Manchester.

Kivunja, C. and Kuyini, A. (2017) 'Understanding and applying research paradigms in educational contexts', *International Journal of Higher Education*, 6(5), pp. 26–41.

Kroeber, A. L. and Kluckhohn, C. (1952) 'Culture: A critical review of concepts and definitions,' *Peabody Museum of Archaeology and Ethnology, Harvard University*, 47(1), p. 223.

Kubany, E. S. (1994) 'A cognitive model of guilt typology in combat related PTSD', *Journal of Traumatic Stress, 7*, pp. 3–19.

Kubany, E. S. and Manke, F. M. (1995) 'Cognitive therapy for trauma related guilt: conceptual bases and treatment outlines', *Cognitive and Behavioural Practice* 2, pp. 27–61.

Kucmin, T. *et al.* (2018). '*Style radzenia sobie ze stresem i dyspozycyjny optymizm jako predyktory nasilenia objawów PTSD w grupie ratowników medycznych'*. ['Coping styles and dispositional optimism as predictors of post-traumatic stress disorder (PTSD) symptoms intensity in paramedics'], *Psychiatria Polska*, 52(3), pp. 557–571. https://doi.org/10.12740/PP/68514

Kuhn, T. S. (1962) *The structure of scientific revolutions*. Chicago: University of Chicago Press.

Kumpfer, K. L. *et al.* (2002) 'Cultural sensitivity and adaptation in family-based prevention interventions', *Prevention Science: the Official Journal of the Society for Prevention*

Research, 3(3), pp. 241–246. https://doi.org/10.1023/a:1019902902119

Lambert, M. J. and Barley, D. E. (2001) 'Research summary on the therapeutic relationship and psychotherapy outcome', *Psychotherapy: Theory, Research, Practice, Training,* 38(4), p. 357.

Lanza, A., Roysircar, G. and Rodgers, S. (2018) 'First responder mental healthcare: Evidence-based prevention, postvention, and treatment', *Professional Psychology: Research and Practice*, 49(3), p. 193.

Lawn, S. *et al.* (2020) 'The effects of emergency medical service work on the psychological, physical, and social well-being of ambulance personnel: a systematic review of qualitative research', *BMC Psychiatry*, 20(1), pp. 1–16.

Lazarus, R. S. and Folkman, S. (1984) *Stress, appraisal, and coping*. New York: Springer Publishing Company.

Leblanc, V. R. (2009) 'The effects of acute stress on performance: implications for health professions education', *Academic Medicine*, 84(10), pp. 25–33. https://doi.org/10.1097/ACM.0b013e3181b37b8f

Leiter, M. P. and Maslach, C. (2009) 'Nurse turnover: The mediating role of burnout', *Journal of Nursing Management*, 17(3), pp. 331–339. https://doi.org/10.1111/j.1365-2834.2009.01004.x

Leiter, M. P., Harvie, P. and Frizzell, C. (1998) 'The correspondence of patient satisfaction and nurse burnout', *Social Science and Medicine,* 47(10), pp. 1611–1617.

Lester, J., Cho, Y. and Lochmiller, C. (2020) 'Learning to do a qualitative data analysis: A starting point', *Human Resource Development Review,* 19(1), pp. 94–106.

Lincoln, Y. S. and Guba, E. G. (1985) *Naturalistic inquiry*. Beverly Hills: Sage Publications.

Loudoun, R. *et al.* (2020). 'The role of peer-to-peer voice in severe work environments: organisational facilitators and barriers', *Industrial Relations Journal*, 51(6), pp. 556–571.

Lubin, G. *et al.* (2007) 'Acute stress disorder and post-traumatic stress disorder among medical personnel in Judea and Samaria areas in the years 2000–2003', *Military Medicine*, 172(4), pp. 376–378.

Luftman, K. *et al.* (2017) 'PTSD in those who care for the injured', *Injury*, *48*(2), pp. 293–296.

Macnab, A. J. *et al.* (1999) 'Critical incident stress intervention after loss of an air ambulance: Two-year follow up', *Prehospital and Disaster Medicine*, 14(1), pp. 15–19.

Maguen, S. *et al.* (2009) 'Routine work environment stress and PTSD symptoms in police officers', *The Journal of Nervous and Mental Disease*, 197(10), p. 754.

Magyar, J. and T. Theophilos (2010) 'Debriefing critical incidents in the emergency department', *Emergency Medicine Australasia*, 22(6), pp. 499–506.

Maini, R., Mounier-Jack, S. and Borghi, J. (2018) 'How to and how not to develop a ToC to evaluate a complex intervention: reflections on an experience in the Democratic Republic of Congo', *BMJ*

Global Health, *3*(1), 000617. https://doi.org/10.1136/bmjgh2017000617

Malmqvist, J. *et al.* (2019) 'Conducting the pilot study: A neglected part of the research process? Methodological findings supporting the importance of piloting in qualitative research studies', *International Journal of Qualitative Methods*, 18, https://doi.org/10.1177/1609406919878341

Marciniak, M. *et al.* (2004) 'Medical and productivity costs of anxiety disorders: case control study', *Depression and Anxiety*, 19(2), pp. 112–120.

Marmar, C. R. *et al.* (2006) 'Predictors of posttraumatic stress in police and other first responders', *Annals of the New York Academy of Sciences*, 1071(1), pp. 1–18.

Marmar, C. R. *et al.* (1996) 'Stress responses of emergency services personnel to the Loma Prieta earthquake Interstate 880 freeway collapse and control traumatic incidents', *Journal of Traumatic Stress*, 9(1), pp. 63–85.

Marmar, C. R. *et al.* (1999) 'Longitudinal course and predictors of continuing distress following critical incident exposure in emergency services personnel', *The Journal of Nervous and Mental Disease*, 187(1), pp. 15–22.

Marshall, R. P. *et al.* (1998) 'Posttraumatic stress disorder and other predictors of health care consumption by Vietnam veterans', *Psychiatric Services*, 49(12), pp. 1609–1611.

Maslach, C. and Jackson, S. E. (1981) 'The measurement of experienced burnout', *Journal of Organizational Behavior*, 2(2), pp. 99–113. https://doi.org/10.1002/job.4030020205

Maslach, C., Schaufeli, W. B. and Leiter, M. P. (2001) 'Job burnout', *Annual Reviews*, 52(1), pp. 397–422.

Maunder, R. G. *et al.* (2012) 'Symptoms and responses to critical incidents in paramedics who have experienced childhood abuse and neglect', *Emergency Medicine Journal*, 29(3), pp. 222–227. https://doi.org/10.1136/emj.2010.099838

McCrae, R. R. and John, O. P. (1992) 'An introduction to the five-factor model and its applications', *Journal of Personality*, 60(2), pp. 175–215.

McGoldrick, M. and Giordano, J. (1996) *Ethnicity and family therapy*. 2nd edn. New York: Guilford.

McFarlane, A. C. (2010) 'The long-term costs of traumatic stress: Intertwined physical and psychological consequences', *World Psychiatry,* 9(1), pp. 3–10.

McFarlane, A. C. and Bryant, R. A. (2007) 'Post-traumatic stress disorder in occupational settings: anticipating and managing the risk', *Occupational Medicine*, 57(6), pp. 404–410. https://doi.org/10.1093/occmed/kqm070

McFarlane, A. C., Williamson, P. and Barton, C. A. (2009) 'The impact of traumatic stressors in civilian occupational settings', *Journal of Public Health Policy*, 30(3), pp. 311–327. https://doi.org/10.1057/jphp.2009.21

Merhej, R. (2019) 'Stigma on mental illness in the Arab world: Beyond the socio-cultural barriers,'

International Journal of Human Rights in Healthcare, 12(4), pp. 285–298.

Meyer, E. C. *et al.* (2012) 'Predictors of posttraumatic stress disorder and other psychological symptoms in trauma-exposed firefighters', *Psychological services*, 9(1), pp. 1–15. https://doi.org/10.1037/a0026414

Miller, S. A. and Grotkowski, K. (2020) 'Physiological Hyperarousal (PHY)', in Zeigler-Hill, V. and Shackelford, T. K. (eds.) *Encyclopedia of Personality and Individual Differences*. Cham: Springer International Publishing, pp. 3921–3925.

Minnie, L., Goodman, S. and Wallis, L. (2015) 'Exposure to daily trauma: The experiences and coping mechanism of emergency medical personnel: A cross-sectional study', *African Journal of Emergency Medicine,* 5(1), pp. 12–18. https://doi.org/10.1016/j.afjem.2014.10.010

Mishra, S. and Alok, S. (2017) *Handbook of research methodology.* Lucknow: Educreation.

Mishra, S. *et al.* (2010) 'Trauma exposure and symptoms of post-traumatic stress disorder in emergency medical services personnel in Hawaii', *Emergency Medicine Journal*, 27(9), pp. 708–711. https://doi.org/10.1136/emj.2009.080622

Misra, M. *et al.* (2009) 'Psychological impact upon London Ambulance Service of the 2005 bombings', *Occupational Medicine*, 59(6), pp. 428–433.

Mitchell, J. T. (1983) 'When disaster strikes … The critical incident stress debriefing process', *Journal of Emergency Medical Services*, 13(11), pp. 49–52.

Mitchell, J. T. and Everly, G. S. (2001) *Critical Incident Stress Debriefing: An operations manual for CISD, defusing and other group crisis intervention services*. Sussex: Chevron Publishing.

Mohajan, H. (2018) 'Qualitative research methodology in social sciences and related subjects', *Journal of Economic Development, Environment and People,* 7(1), pp. 23–48.

Moher, D. *et al.* (2009) 'Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement', *Annals of Internal Medicine*, 151(4), pp. 264–269.

Moore, G., Copeland, L. and Craig, P. (2021) 'Adaptation of interventions for implementation and/or re-evaluation in new contexts: The ADAPT guidance', *British Medical Journal,* 374, p. 1679.

Movsisyan, A. *et al.* (2019) 'Adapting evidence-informed complex population health interventions for new contexts: a systematic review of guidance', *Implementation Science*, 14(1), pp. 1–20.

Müller-Leonhardt, A. *et al.* (2014) 'Critical Incident Stress Management (CISM) in complex systems: Cultural adaptation and safety impacts in healthcare', *Accident Analysis and Prevention*, 68, pp. 172–180.

Muñoz, R. and Mendelson, T. (2005) 'Toward evidence-based interventions for diverse populations: the San Francisco General Hospital prevention and treatment manuals', *Journal of Consulting and Clinical Psychology*, 73(5), p. 790.

Murray, J., Ehlers, A. and Mayou, R. A. (2002) 'Dissociation and post-traumatic stress disorder: Two prospective studies of road traffic accident survivors', *The British Journal of Psychiatry*, 180(4), pp. 363–368.

Muscatello, M. R. A. et al. (2020) 'The wounds of childhood: Early trauma subtypes, salience and hyperarousal in a sample of adult psychiatric patients', *International Journal of Social Psychiatry*, 66(1), pp. 3–9.

Naeem, F. (2019) 'Cultural adaptations of CBT: A summary and discussion of the special issue on cultural adaptation of CBT', *The Cognitive Behaviour Therapist*, 12, p. 40.

Nakao, M., Yamanaka, G. and Kuboki, T. (2002) 'Suicidal ideation and somatic symptoms of patients with mind/body distress in a Japanese psychosomatic clinic', *Suicide and Life-Threatening Behavior*, 32(1), pp. 80–90. https://doi.org/10.1521/suli.32.1.80.22179

National Ambulance (2022a) *Clinical Education and Training*. Available at: https://nationalambulance.ae/en/page/clinical-education-and-training (Accessed: February 11, 2022).

National Ambulance UAE (2022b) *National Ambulance*. Available at: https://nationalambulance.ae/en (Accessed: September 3, 2022).

Naumann, D. N. *et al.* (2017) 'Acute stress and frontline healthcare providers', *Journal of Paramedic Practice*, 9(12), pp. 516–521.

Ndikumana, C., Tubey, R. and Kwonyike, J. (2019) 'Involvement in decision-making processes and retention of health workers: Findings from a cross-sectional study in the Rwandan Public District Hospitals', *The Pan African Medical Journal*, 34, p. 129. https://doi.org/10.11604/pamj.2019.34.129.16514

Newland, C. *et al.* (2015) 'Critical stress. Survey reveals alarming rates of EMS provider stress and thoughts of suicide', *JEMS: A Journal of Emergency Medical Services*, 40(10), pp. 30–34.

Newman, A., Donohue, R. and Eva, N. (2017) 'Psychological safety: A systematic review of the literature', *Human Resource Management Review*, 27(3), pp. 521–535.

Nierkens, V. *et al.* (2013) 'Effectiveness of cultural adaptations of interventions aimed at smoking cessation, diet, and/or physical activity in ethnic minorities. a systematic review', *PloS One*, 8(10), e73373. https://doi.org/10.1371/journal.pone.0073373

Noble, J. (2019) *Theory of change in ten steps.* London: New Philanthropy Capital.

Norenzayan, A. and Lee, A. (2010) 'It was meant to happen: Explaining cultural variations in fate attributions', *Journal of Personality and Social Psychology,* 98(5), pp. 702–720. https://doi.org/10.1037/a0019141

Ntatamala, I. and Adams, S. (2022) 'The correlates of post-traumatic stress disorder in ambulance

personnel and barriers faced in accessing care for work-related stress', *International Journal of Environmental Research and Public Health*, 19(4), p. 2046.

Oafi, M. K., Beovich, B. and Williams, B. (2022) 'Emiratization of emergency medical services in the United Arab Emirates,' *Paramedicine and Emergency Response*, 3, pp. 10–15.

O'Cathain, A. *et al.* (2019) 'Guidance on how to develop complex interventions to improve health and healthcare', *BMJ Open*, 9(8), e029954. https://doi.org/10.1136/bmjopen-2019-029954

Ogińska-Bulik, N. (2015) 'Social support and negative and positive outcomes of experienced traumatic events in a group of male emergency service workers', *International Journal of Occupational Safety and Ergonomics*, 21(2), pp. 119–127. https://doi.org/10.1080/10803548.2015.1028232

Ogińska-Bulik, N. and Kobylarczyk, M. (2015) 'Relation between resiliency and post-traumatic growth in a group of paramedics: The mediating role of coping strategies', *International Journal of Occupational Medicine and Environmental Health*, 28(4), pp. 707–719. https://doi.org/10.13075/ijomeh.1896.00323

Ozer, E. J. *et al.* (2003) 'Predictors of posttraumatic stress disorder and symptoms in adults: a meta-analysis', *Psychological Bulletin*, 129(1), p. 52.

Paintain, E. and Cassidy, S. (2018) 'First-line therapy for post-traumatic stress disorder: A systematic review of cognitive behavioural therapy and psychodynamic approaches', *Counselling and Psychotherapy Research*, 18(3), pp. 237–250.

Pajonk, F. G. *et al.* (2011) 'Personality traits of emergency physicians and paramedics', *Emergency Medicine Journal*, 28(2), pp. 141–146.

Parker, L. D. (2012) 'Qualitative management accounting research: Assessing deliverables and relevance', *Critical Perspectives on Accounting*, 23(1), pp. 54–70.

Patton, M. Q. (2002) *Qualitative research and evaluation methods*. 3rd edn. Thousand Oaks: Sage Publications.

Pearsall, M. J. and Ellis, A. P. (2011) 'Thick as thieves: the effects of ethical orientation and psychological safety on unethical team behaviour', *Journal of Applied Psychology, 96,* pp. 401–411.

Petticrew, M., McKee, M. and Marteau, T. M. (2018) 'Partnerships with the alcohol industry at the expense of public health', *Lancet (London, England)*, 392(10152), pp. 992–993.

Petrie, K. *et al.* (2018a) 'Prevalence of PTSD and common mental disorders amongst ambulance personnel: a systematic review and meta-analysis', *Social Psychiatry and Psychiatric Epidemiology*, 53(9), pp. 897–909.

Petrie, K. *et al.* (2018b) 'The importance of manager support for the mental health and well-being of ambulance personnel', *PLoS One*, 13(5), e0197802.

Picoraro, J. A. et al. (2014) 'Posttraumatic growth in parents and pediatric patients', *Journal of Palliative*

Medicine, 17(2), pp. 209–218.

Pietrantoni, L. and Prati, G. (2008) 'Resilience among first responders', *African Health Sciences*, 8(1), pp. 14–20.

Prinsen, G. and Nijhof, S. (2015) 'Between logframes and ToC: reviewing debates and a practical experience', *Development in Practice*, 25(2), pp. 234–246. https://doi.org/10.1080/09614524.2015.1003532

Poghosyan, L. *et al.* (2010) 'Nurse burnout and quality of care: Cross-national investigation in six countries', *Research in Nursing and Health*, 33(4), pp. 288–298.

Porter, S. (2013) *An exploration of the support needs of ambulance paramedics*. Doctoral Dissertation. Victoria University. Available at: http://vuir.vu.edu.au/22296/1/Sandra%20Porter.pdf (Accessed: 9 November 2020).

Purgato, M. *et al.* (2020) 'Promotion, prevention and treatment interventions for mental health in low-and middle-income countries through a task-shifting approach', *Epidemiology and Psychiatric Sciences*, 29, p. e150. https://doi.org/10.1017/S204579602000061X

Pyper, Z. and Paterson, J. L. (2019) 'Fatigue and mental health in Australian rural and regional ambulance personnel,' *Emergency Medicine Australasia,* 28(1), pp. 62–66.

QSR International, LCC (2018) *NVivo qualitative data analysis software*. Available at: https://www.qsrinternational.com/nvivo/home (Accessed: 9 November 2022).

Rathod, S. *et al.* (2018) 'The current status of culturally adapted mental health interventions: a practice-focused review of meta-analyses', *Neuropsychiatric Disease and Treatment*, 14, p. 165.

Rathod, S., Phiri, P. and Naeem, F. (2019) 'An evidence-based framework to culturally adapt cognitive behaviour therapy,' *The Cognitive Behaviour Therapist.* Cambridge University Press, 12, p. e10. https://doi.org/10.1017/S1754470X18000247

Ravenscroft, T. (1994) *Going critical: GMB/Apex and TandG Unions 1994 survey of occupational stress factors in accident and emergency staff in the London ambulance service*. London: GMB/Apex/and TandG Unions.

Reed, A. (2016) *Community-based psychological first aid for emergency medical service providers: Mental health stigma, resilience, and social support*. Doctoral Dissertation. University of South Dakota. Available at: http://search.proquest.com/docview/1842423207/ (Accessed: 9 November 2022).

Regambal, M. J. *et al.* (2015) 'Characteristics of the traumatic stressors experienced by rural first responders', *Journal of Anxiety Disorders*, 34, pp. 86–93.

Regehr, C. and Bober, T. (2005) *In the line fire: Trauma in the emergency services*. Oxford: University Press.

Regehr, C. and Leblanc, V. R. (2017) 'PTSD, acute stress, performance and decision-making in emergency service workers', *The Journal of the American Academy of Psychiatry and the Law*, 45, pp. 184–192.

Regehr, C. *et al.* (2002) 'Posttraumatic symptoms and disability in paramedics', *The Canadian Journal of Psychiatry*, 47(10), pp. 953–958.

Regehr, C. *et al.* (2003a) 'Postmortem inquiries and trauma responses in paramedics and firefighters', *Journal of Interpersonal Violence*, 18(6), pp. 607–622.

Regehr, C. *et al.* (2003b) 'Social support, self-efficacy and trauma in new recruits and experienced firefighters', *Stress and Health*, 19(4), pp. 189–193.

Regehr, C., Goldberg, G. and Hughes, J. (2002) 'Exposure to human tragedy, empathy, and trauma in ambulance paramedics', *American Journal of Orthopsychiatry*, 72(4), pp. 505–513. https://doi.org/10.1037/0002-9432.72.4.505

Regehr, C., Hill, J. and Glancy, G. (2000) 'Individual predictors of traumatic reactions in firefighters', *Journal of Nervous and Mental Disease*, 188(6), pp. 333–339.

Rice, V. *et al.* (2014) 'Exploring physical health perceptions, fatigue and stress among health care professionals', *Journal of Multidisciplinary Healthcare*, 7, pp. 155–161.

Richins, M. T. *et al.* (2020) 'Early post-trauma interventions in organizations: a scoping review', *Frontiers in Psychology*, 11, p. 1176.

Ritchie, J. and Elam, G. (2003) 'Designing and selecting samples,' in Ritchie, J. and Elam, G. (eds.) *Qualitative research practice: A guide for social science students and researchers.* Thousand Oaks: Sage, pp. 77–108.

Roberts, N. P. et al. (2019) 'Early psychological intervention following recent trauma: A systematic review and meta-analysis', *European Journal of Psychotraumatology*, 10(1), 1695486.

Robson, C. (2011) *Real world research: A resource for users of social research methods in applied settings*, 3rd edn. Chichester: Wiley.

Rodgers, L. M. (1998) 'A five-year study comparing early retirements on medical grounds in ambulance personnel with those in other groups of health service staff', *Occupational Medicine*, 48(1), pp. 7–16. https://doi.org/10.1093/occmed/48.1.7

Rogers, P.J. *et al.* (2000) 'Program theory evaluation: Practice, promise, and problems', *New Directions for Evaluation*, 2000(87), pp. 5–13.

Roller, M. and Lavrakas, P. (2015) *Applied qualitative research design: A total quality framework approach*. New York: The Guilford Press.

Rose, S., Bisson, J. and Wessely, S. (2003) 'A systematic review of single-session psychological interventions ('debriefing') following trauma', *Psychotherapy and Psychosomatics*, 72(4),

pp. 176–184. https://doi.org/10.1159/000070781

Rothman, A. and Coyle, A. (2018) 'Toward a framework for Islamic psychology and psychotherapy: An Islamic model of the soul,' *Journal of Religion and Health*, 57(5), pp. 1731–1744.

Rothbaum, B. and Davis, M. (2003) 'Applying learning principles to the treatment of post-trauma reactions', *Annals of the New York Academy of Sciences*, 1008(1), pp. 112–121. https://doi.org/10.1196/annals.1301.012

Rybojad, B. *et al.* (2016) 'Risk factors for posttraumatic stress disorder in Polish paramedics: A pilot study', *The Journal of Emergency Medicine*, *50*(2), pp. 270–276. https://doi.org/10.1016/j.jemermed.2015.06.03

Saldaña, J. (2021) *The coding manual for qualitative researchers*. London: Sage Publications.

Sandelowski, M. (1996) 'One is the liveliest number: The case orientation of qualitative research', *Research in Nursing and Health*, 19(6), pp. 525–529.

Sareen, J. (2014) 'Posttraumatic stress disorder in adults: Impact, comorbidity, risk factors, and treatment', *The Canadian Journal of Psychiatry,* 59(9), pp. 460–467.

Sasser, S., Gibbs, M. and Blackwell, T. (2004) 'Prehospital emergency care in Abu Dhabi, United Arab Emirates', *Prehospital Emergency Care*, 8(1), pp. 51–57. https://doi.org/10.1080/312703002818

Saunders, M., Lewis, P. and Thornhill, A. (2009) *Research methods for business students*. 5th edn. London: Pearson Education Limited.

Sayed, M. A. (2015) 'Mental health services in the United Arab Emirates: Challenges and opportunities', *International Journal of Emergency Mental Health*, 17(3), pp. 661–663. https://doi.org/10.4172/1522-4821.1000263

Schwandt, T. A. (2001) *Dictionary of qualitative inquiry.* 5th edn. Thousand Oaks: Sage.

Schierhout, G. *et al.* (2013) 'Evaluating the effectiveness of a multifaceted, multilevel continuous quality improvement program in primary health care: developing a realist theory of change', *Implementation Science*, 8(1), pp. 1–15.

Scott, C. and Medaugh, M. (2017) 'Axial coding', *The International Encyclopedia of Communication Research Methods*, 10, 9781118901731.

Selye, H. (1950) 'Stress and the general adaptation syndrome', *British Medical Journal*, 1(4672), pp. 1383–1392.

Serrat, O. and Serrat, O. (2017) 'Theories of change', In Serrat, O. and Serrat, O. (eds.) *Knowledge solutions: tools, methods, and approaches to drive organizational performance.* Singapore: Springer, pp. 237–243.

Shaheen, M. and Pradhan, S. (2019) 'Sampling in qualitative research', in *Qualitative techniques for workplace data analysis*. IGI Global, pp. 25–51.

Shahsavari, H. et al. (2020) 'Medical research council framework for development and evaluation of complex interventions: a comprehensive guidance', *Journal of Education and Health Promotion*, *9*(1), p. 88.

Shakespeare-Finch, J. and Daley, E. (2017) 'Workplace belongingness, distress, and resilience in emergency service workers', *Psychological Trauma: Theory, Research, Practice, and Policy*, 9(1), p. 32.

Shakespeare-Finch, J. E. et al. (2003) 'The prevalence of post-traumatic growth in emergency ambulance personnel', *Traumatology*, 9(1), pp. 58–71.

Shapiro, F. (2001) 'Eye movement desensitization and reprocessing: Basic principles, protocols, and procedures', *Comprehensive handbook of psychotherapy: Cognitive-behavioral approaches,* 2, pp. 241–272.

Shapiro, F. (2018) *Eye movement desensitization and reprocessing (EMDR) therapy: Basic principles, protocols, and procedures*. New York: Guilford Publications.

Shapiro, F. and Laliotis, D. (2011) 'EMDR and the adaptive information processing model: Integrative treatment and case conceptualization', *Clinical Social Work Journal*, 39(2), pp. 191–200.

Shepherd, L. and Wild, J. (2013) 'Cognitive appraisals, objectivity and coping in ambulance workers: a pilot study', *Emergency Medicine Journal*, 31(1), pp. 41–44. https://doi.org/10.1136/emermed-2011-200511

Shepherd, L. and Wild, J. (2014) 'Emotion regulation, physiological arousal and PTSD symptoms in trauma-exposed individuals', *Journal of Behavior Therapy and Experimental Psychiatry*, 45(3), pp. 360–367. https://doi.org/10.1016/j.jbtep.2014.03.002

Shidhaye, R. *et al.* (2019) 'Delivering a complex mental health intervention in low-resource settings: lessons from the implementation of the PRIME mental healthcare plan in primary care in Sehore district, Madhya Pradesh, India', *BJPsych Open*, 5(5), e63. https://doi.org/10.1192/bjo.2019.53

Shoji, K. *et al.* (2015) 'What comes first, job burnout or secondary traumatic stress? Findings from two longitudinal studies from the US and Poland', *PloS One*, 10(8), e0136730.

Silverman, D. (2011) *Interpreting qualitative data: a guide to the principles of qualitative research*. London: Sage.

Skivington, K. *et al.* (2021) 'A new framework for developing and evaluating complex interventions: update of Medical Research Council guidance', *BMJ (Clinical Research edn.)*, 374, n2061. https://doi.org/10.1136/bmj.n2061

Skogstad, L., Fjetland, A. M. and Ekeberg, Ø. (2015) 'Exposure and posttraumatic stress symptoms among first responders working in proximity to the terror sites in Norway on July 22, 2011 - A cross-sectional study', *Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine*,

23(1), pp. 1–9. https://doi.org/10.1186/s13049-015-0104-4.

Skogstad, M. *et al.* (2013) 'Work-related post-traumatic stress disorder', *Occupational Medicine*, 63(3), pp. 175–182.

Smith, A. and Roberts, K. (2003) 'Interventions for post-traumatic stress disorder and psychological distress in emergency ambulance personnel: A review of the literature', *Emergency Medicine Journal*, 20(1), pp. 75–78. https://doi.org/10.1136/emj.20.1.75

Solati, F. (2017) 'Measuring patriarchy: The determinants of patriarchy in the Middle East and North Africa', in *Women, Work, and Patriarchy in the Middle East and North Africa*. Palgrave Macmillan, Cham, pp. 65–102. https://doi.org/10.1007/978-3-319-51577-9_4

Soto, A. *et al.* (2018) 'Cultural adaptations and therapist multicultural competence: Two meta-analytic reviews', *Journal of Clinical Psychology*, 74(11), pp. 1907–1923.

Spyros, V., Emmanuel, V. and Constantinos, K. (2008) 'Daily stress and concept of self in Greek ambulance personnel', *Annals of General Psychiatry*, 7(1). https://doi.org/10.1186/1744-859x-7-s1-s334

Stein, M. B. *et al.* (2002) 'Patterns of incidence and psychiatric risk factors for traumatic events', *International Journal of Methods in Psychiatric Research*, 11(4), pp. 143–153.

Stein, M. B. *et al.* (1997) 'Full and partial posttraumatic stress disorder: findings from a community survey', *The American Journal of Psychiatry,* 154(8), 1114–1119. https://doi.org/10.1176/ajp.154.8.1114

Stephens, C. V. (1997) 'Debriefing, social support and PTSD in the New Zealand police: Testing a multidimensional model of organisational traumatic stress', *Australasian Journal of Disaster and Trauma Studies*, 1(1).

Sterne, J. A. *et al.* (2016) 'ROBINS-I: a tool for assessing risk of bias in non-randomised studies of interventions', *BMJ (Clinical Research edn.)*, 355, i4919. https://doi.org/10.1136/bmj.i4919

Sterud, T. *et al.* (2008a) 'Health problems and help-seeking in a nationwide sample of operational Norwegian ambulance personnel', *BMC Public Health*, 8(1), pp. 1–9.

Sterud, T. *et al.* (2008b) 'Suicidal ideation and suicide attempts in a nationwide sample of operational Norwegian ambulance personnel', *Journal of Occupational Health*, 50(5), pp. 406–414.

Sterud, T., Ekeberg, Ø. and Hem, E. (2006) 'Health status in the ambulance services: a systematic review', *BMC Health Services Research*, 6(1). https://doi.org/10.1186/1472-6963-6-82

Streb, M., Häller, P. and Michael, T. (2014) 'PTSD in paramedics: Resilience and sense of coherence', *Behavioural and Cognitive Psychotherapy*, 42(4), pp. 452–463. https://doi.org/10.1017/S1352465813000337

Sue, S. (2003) 'In defense of cultural competency in psychotherapy and treatment', *American*

Psychologist, 58, pp. 964–970.

Sullivan, H. and Stewart, M. (2006) 'Who owns the ToC?' *Evaluation*, 12(2), pp. 179–199. https://doi.org/10.1177/1356389006066971

Sundell, K. *et al.* (2016) 'Novel programs, international adoptions, or contextual adaptations? Meta-analytical results from German and Swedish intervention research', *Journal of Clinical Child and Adolescent Psychology*, 45(6), pp. 784–796.

Sutton, J. and Austin, Z. (2015) 'Qualitative research: Data collection, analysis, and management', *The Canadian Journal of Hospital Pharmacy*, 68(3), pp. 226–231. https://doi.org/10.4212/cjhp.v68i3.1456

Swaraj, A. (2019) 'Exploratory research: Purpose and process', *Parisheelan,* 15(2), pp. 666–669.

Tashakkori, A. and Teddlie, C. (Eds). (2003a). Handbook of Mixed Methods in Social and Behavioral Research. Thousand Oaks: Sage.

Tashakkori, A. and Teddlie, C. (2003b). Major issues and controversies in the use of mixed methods in the social and behavioral sciences. In A. Tashakorri & C. Teddlie (Eds.), *Handbook of mixed methods in social & behavioural research* (pp. 3–50). Thousand Oaks: Sage Publications.

Tedeschi, R. and Calhoun, L. G. (1996) 'The posttraumatic growth inventory: Measuring the positive legacy of trauma', *Journal of Traumatic Stress*, 9(3), pp. 455–471.

Tedeschi, R. G. and Calhoun, L. G. (2004) 'Posttraumatic growth: Conceptual foundations and empirical evidence', *Psychological Inquiry*, 15(1), pp. 19–92. https://doi.org/10.1207/s15327965pli1501

Temby, P. and Gucciardi, D. F. (2010) *Conceptualising mental toughness in the military domain*. Adelaide: Defence Human Sciences Symposium.

Tenny, S.; Kerndt, C.C.; Hoffman, M.R. Case Control Studies; StatPearls Publishing: Treasure Island, FL, USA, 2020.

Thirioux, B., Birault, F. and Jaafari, N. (2016) 'Empathy is a protective factor of burnout in physicians: new neuro-phenomenological hypotheses regarding empathy and sympathy in care relationship', *Frontiers in Psychology*, 7. https://doi.org/10.3389/fpsyg.2016.00763

Thoits, P. A. (1995) 'Stress, coping, and social support processes: Where are we? What next?' *Journal of Health and Social Behavior*, 35, pp. 53–79.

Thomas, O. and Lawal, O. (2020) 'Exploratory research design in management sciences: An x-ray of literature', *Annals of 'Dunarea de Jos' University of Galati Fascicle Economics and Applied Informatics,* 26(2), pp. 79–84.

Thoresen, S. and Mehlum, L. (2006) 'Suicide in peacekeepers: Risk factors for suicide versus accidental death', *Suicide and Life-Threatening Behavior*, 36(4), pp. 432–442. https://doi.org/10.1521/suli.2006.36.4.432

Trochim, W.M.K. (2006). *Research methods knowledge base.* Retrieved on January 25, 2010 from **http://www.socialresearchmethods.net**

Uchino, B. N. (2006) 'Social support and health: A review of physiological processes potentially underlying links to disease outcomes', *Journal of Behavioral Medicine*, 29(4), pp. 377–387. https://doi.org/10.1007/s10865-006-9056-5

United Arab Emeries Government Portal (2022) *History of the UAE*. Available at: https://u.ae/en/more/history-of-the-uae (Accessed: May 18, 2022).

Ursano, R. J. *et al.* (1995) 'Longitudinal assessment of posttraumatic stress disorder and depression after exposure to traumatic death', *The Journal of Nervous and Mental Disease*, 183(1), pp. 36–42.

Vagni, M. *et al.* (2020) 'Hardiness, stress and secondary trauma in Italian healthcare and emergency workers during the COVID-19 pandemic', *Sustainability*, 12(14), 5592. https://doi.org/10.3390/su12145592

Vaisoradi, M. and Snelgrove, S. (2019) 'Theme in qualitative content analysis and thematic analysis', *Forum Qualitative Sozialforschung,* 20(3), pp. 1–14.

Van der Meer, C. A. *et al.* (2020) 'Help in hand after traumatic events: a randomized controlled trial in health care professionals on the efficacy, usability, and user satisfaction of a self-help app to reduce trauma-related symptoms', *European Journal of Psychotraumatology*, 11(1), 1717155.

Van der Ploeg, E. and Kleber, R. J. (2003) 'Acute and chronic job stressors among ambulance personnel: Predictors of health symptoms', *Occupational and Environmental Medicine*, 60(1), pp. 40–46.

Van Emmerik, A. A. *et al.* (2002) 'Single session debriefing after psychological trauma: A meta-analysis', *The Lancet*, *360*(9335), pp. 766–771.

Vaportzis, E., Clausen, M. G. and Gow, A. J. (2017) 'Older adults perceptions of technology and barriers to interacting with tablet computers: A focus group study', *Frontiers in Psychology*, 8, 1687. https://doi.org/10.3389/fpsyg.2017.01687

Vasileiou, K. *et al.* (2018) 'Characterising and justifying sample size sufficiency in interview-based studies: systematic analysis of qualitative health research over a 15-year period', *BMC Medical Research Methodology*, 18(1), p. 148. https://doi.org/10.1186/s12874-018-0594-7

Viswanath, B. and Chaturvedi, S. K. (2012) 'Cultural aspects of major mental disorders: A critical review from an Indian perspective', *Indian Journal of Psychological Medicine*, 34(4), pp. 306–312.

Volkow, N. D., Gordon, J. A. and Koob, G. F. (2021) 'Choosing appropriate language to reduce the stigma around mental illness and substance use disorders', *Neuropsychopharmacology*, 46(13), pp. 2230–2232.

Vries, R. E. D., de Vries, A. and Feij, J. A. (2009) 'Sensation seeking, risk-taking, and the HEXACO model of personality', *Personality and Individual Differences*, 47(6), pp. 536–540.

https://doi.org/10.1016/j.paid.2009.05.029

Vytal, K. E. *et al.* (2013) 'The complex interaction between anxiety and cognition: insight from spatial and verbal working memory', *Frontiers in Human Neuroscience*, 7, p. 93.

Wagner, S. L. *et al.* (2020) 'Ambulance personnel: Systematic review of mental health symptoms', *Traumatology*, 26(4), p. 370.

Wahyuni, D. (2012) 'The research design maze: Understanding paradigms, cases, methods and methodologies', *Journal of Applied Management Accounting Research*, 10(1), pp. 69–80.

Ward, C. L., Lombard, C. J. and Gwebushe, N. (2006) 'Critical incident exposure in South African emergency services personnel: Prevalence and associated mental health issues', *Emergency Medicine Journal*, 23(3), pp. 226–231. https://doi.org/10.1136/emj.2005.025908

Warren, K. D. (1995) *Critical incident stress debriefing with emergency service workers.* California: California School of Professional Psychology-Fresno.

Webster, N. (2019) 'Dubai mental health study highlights shift in attitudes', *The National,* 31 January. Available at: https://www.thenational.ae/uae/health/dubai-mental-health-study-highlights-shift-in-attitudes-1.187797 (Accessed: 9 November 2022)

Weiss, C. H. (1995) 'Nothing as practical as good theory: exploring theory-based evaluation for comprehensive community initiatives for children and families', *New Approaches to Evaluating Community Initiatives: Concepts, Methods, and Contexts*, 1, pp. 65–92.

Wee, D. F., Mills, D. M. and Koehler, G. (1999) 'The effects of critical incident stress debriefing (CISD) on emergency medical services personnel following the Los Angeles civil disturbance', *International Journal of Emergency Mental Health*. 1(1), pp. 33–7.

Wesemann, U. *et al.* (2020) 'Impact of crisis intervention on the mental health status of emergency responders following the Berlin terrorist attack in 2016', *Disaster Medicine and Public Health Preparedness*, 14(2), pp. 168–172.

Whaley, A. L., and Davis, K. E. (2007) 'Cultural competence and evidence-based practice in mental health services: A complementary perspective', *American Psychologist*, 62(6), pp. 563–574. https://doi.org/10.1037/0003-066x.62.6.563

Wild, J. *et al.* (2016) 'A prospective study of pre-trauma risk factors for post-traumatic stress disorder and depression', *Psychological Medicine*, 46(12), pp. 2571–2582. https://doi.org/10.1017/S0033291716000532

Williams, B. *et al.* (2017) 'The relationship between empathy and burnout–lessons for paramedics: a scoping review', *Psychology Research and Behavior Management*, 10, p. 329.

Williams, E. S. *et al.* (2001) 'Understanding physicians: intentions to withdraw from practice: the role of job satisfaction, job stress, mental and physical health', in *Advances in Health Care Management*.

Emerald Group Publishing Limited.

Willig, C. and Rogers, W. S. (eds.) (2017) *The SAGE handbook of qualitative research in psychology*. Sage.

Wilson, D. H. *et al.* (2022) 'Adaption of a culturally informed stress reduction intervention for Native American Head Start Teachers using ADAPT-ITT and CBPR methodologies', [Preprint (version 1)]. Available at: https://doi.org/10.21203/rs.3.rs-1727821/v1 (Accessed: 22 Dec 2022).

Wiltsey, S. S., Baumann, A. A. and Miller, C. J. (2019) 'The FRAME: An expanded framework for reporting adaptations and modifications to evidence-based interventions,' *Implementation Science*, 14(1), pp. 1–10.

Winders, W. T. *et al.* (2021) 'Establishing the effectiveness of interventions provided to first responders to prevent and/or treat mental health effects of response to a disaster: a systematic review', *Disaster Medicine and Public Health Preparedness*, 15(1), pp. 115–126.

Wingood, G. M. and DiClemente, R. J. (2008) 'The ADAPT-ITT model: A novel method of adapting evidence-based HIV interventions', *Journal of Acquired Immune Deficiency Syndromes,* 47, pp. s40–s46. https://doi.org/10.1097/QAI.0b013e3181605df1

Wingood, G. M. *et al.* (2011a) 'Efficacy of a health educator-delivered HIV prevention intervention for Latina women: A randomized controlled trial', *American Journal of Public Health,* 101(12), pp. 2245–2252. https://doi.org/10.2105/AJPH.2011.300340

Wingood, G. M. *et al.* (2011b) 'Design of a faith- based HIV intervention: Successful collaboration between a university and a church', *Health Promotion Practice,* 12(6), pp. 823–831. https://doi.org/10.1177/1524839910372039

Woods, G. L. (2007) *Post traumatic stress symptoms and critical incident stress debriefing (CISD) in emergency medical services (EMS) personnel*. Master's thesis. East Tennessee State University.

Wu, S. *et al.* (2012) 'A new psychological intervention: "512 Psychological Intervention Model" used for military rescuers in Wenchuan Earthquake in China', *Social Psychiatry and Psychiatric Epidemiology*, 47(7), pp. 1111–1119. https://doi.org/10.1007/s00127-011-0416-2

Yin, R. (2015) *Qualitative research from start to finish.* 2nd edn. New York: Guilford Publications.

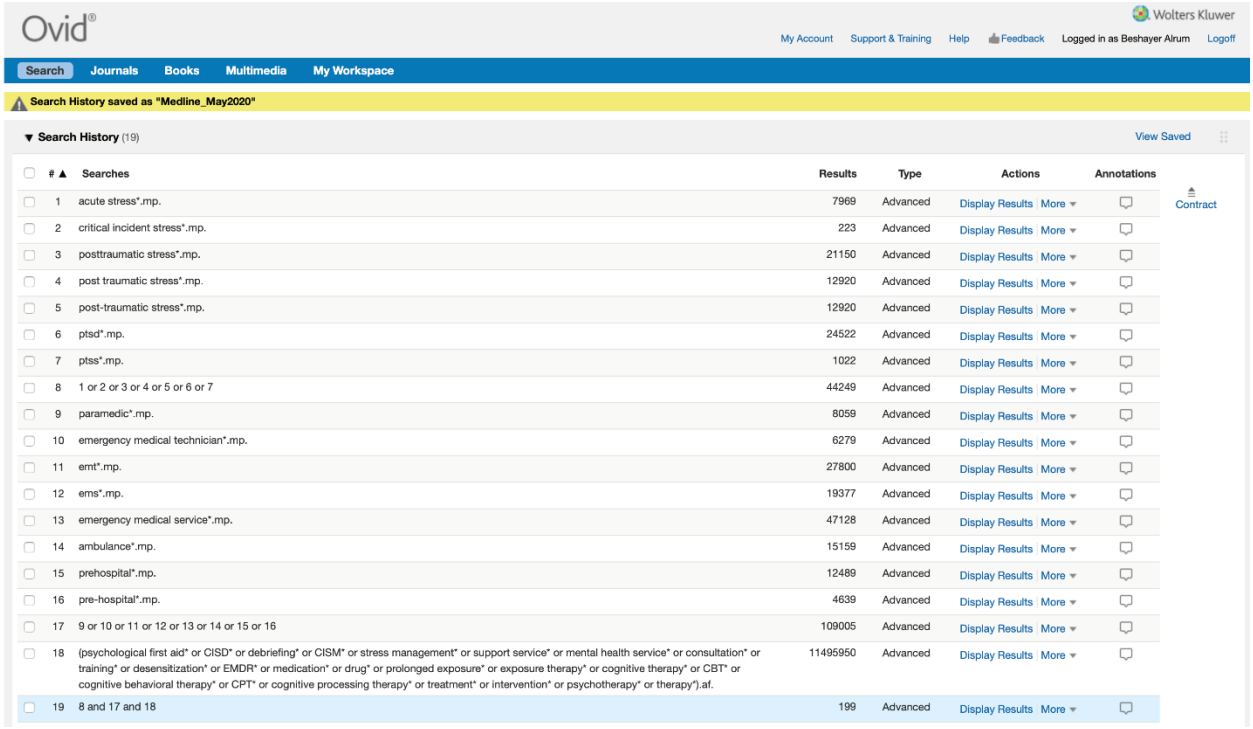
APPENDIX 1: SCREENSHOTS OF SEARCHES

Search History/Alerts

Print Search History | Retrieve Searches | Retrieve Alerts | Save Searches / Alerts

Select / deselect all | Search with AND | Search with OR | Delete Searches | Refresh Search Results

	Search ID#	Search Terms	Search Options	Actions
☐	S6	((drug* OR prolonged exposure* OR exposure therapy* OR cognitive therapy* OR CBT* OR cognitive behavioral therapy* OR CPT* OR cognitive processing therapy* OR treatment* OR intervention* OR psychotherapy* OR therapy*) AND (S3 OR S4)) AND (S1 AND S2 AND S5)	**Expanders** - Apply equivalent subjects **Search modes** - Boolean/Phrase	View Results (210) | View Details | Edit
☐	S5	(drug* OR prolonged exposure* OR exposure therapy* OR cognitive therapy* OR CBT* OR cognitive behavioral therapy* OR CPT* OR cognitive processing therapy* OR treatment* OR intervention* OR psychotherapy* OR therapy*) AND (S3 OR S4)	**Expanders** - Apply equivalent subjects **Search modes** - Boolean/Phrase	View Results (2,522,820) | View Details | Edit
☐	S4	drug* OR prolonged exposure* OR exposure therapy* OR cognitive therapy* OR CBT* OR cognitive behavioral therapy* OR CPT* OR cognitive processing therapy* OR treatment* OR intervention* OR psychotherapy* OR therapy*	**Expanders** - Apply equivalent subjects **Search modes** - Boolean/Phrase	View Results (2,522,820) | View Details | Edit
☐	S3	psychological first aid* OR CISD* OR debriefing* OR CISM* OR stress management* OR support service* OR mental health service* OR consultation* OR training* OR desensitization* OR EMDR* OR medication*	**Expanders** - Apply equivalent subjects **Search modes** - Boolean/Phrase	View Results (532,933) | View Details | Edit
☐	S2	paramedic* OR ems* OR emergency medical service* OR pre-hospital* OR prehospital* OR ambulance* OR emergency medical technician* OR emt*	**Search modes** - Boolean/Phrase	Rerun | View Details | Edit
☐	S1	acute stress* OR critical incident stress* OR posttraumatic stress* OR post traumatic stress* OR post-traumatic stress* OR ptsd* OR ptss*	**Search modes** - Boolean/Phrase	Rerun | View Details | Edit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2 critical incident stress*.mp. 223 Advanced Display Results | More
3 posttraumatic stress*.mp. 21150 Advanced Display Results | More
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8 1 or 2 or 3 or 4 or 5 or 6 or 7 44249 Advanced Display Results | More
9 paramedic*.mp. 8059 Advanced Display Results | More
10 emergency medical technician*.mp. 6279 Advanced Display Results | More
11 emt*.mp. 27800 Advanced Display Results | More
12 ems*.mp. 19377 Advanced Display Results | More
13 emergency medical service*.mp. 47128 Advanced Display Results | More
14 ambulance*.mp. 15159 Advanced Display Results | More
15 prehospital*.mp. 12489 Advanced Display Results | More
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18 (psychological first aid* or CISD* or debriefing* or CISM* or stress management* or support service* or mental health service* or consultation* or training* or desensitization* or EMDR* or medication* or drug* or prolonged exposure* or exposure therapy* or cognitive therapy* or CBT* or cognitive behavioral therapy* or CPT* or cognitive processing therapy* or treatment* or intervention* or psychotherapy* or therapy*).af. 11495950 Advanced Display Results | More
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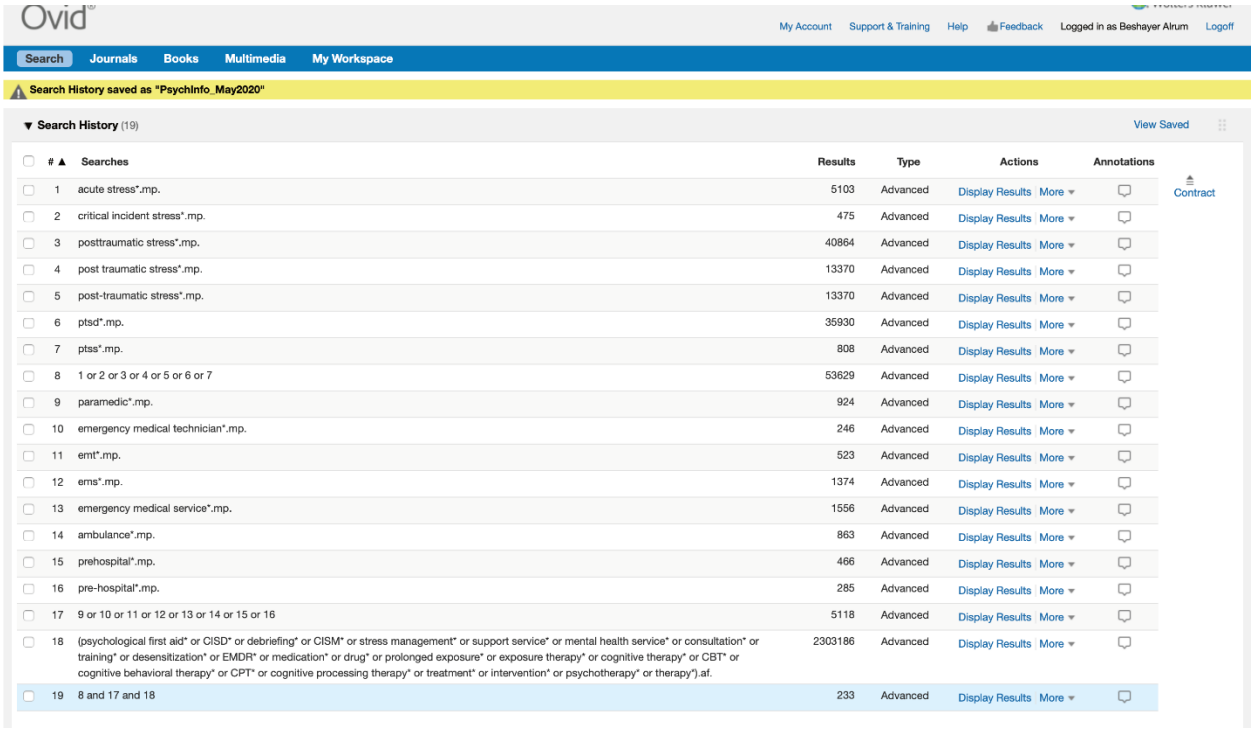
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1 acute stress*.mp. 5103 Advanced Display Results | More
2 critical incident stress*.mp. 475 Advanced Display Results | More
3 posttraumatic stress*.mp. 40864 Advanced Display Results | More
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6 ptsd*.mp. 35930 Advanced Display Results | More
7 ptss*.mp. 808 Advanced Display Results | More
8 1 or 2 or 3 or 4 or 5 or 6 or 7 53629 Advanced Display Results | More
9 paramedic*.mp. 924 Advanced Display Results | More
10 emergency medical technician*.mp. 246 Advanced Display Results | More
11 emt*.mp. 523 Advanced Display Results | More
12 ems*.mp. 1374 Advanced Display Results | More
13 emergency medical service*.mp. 1556 Advanced Display Results | More
14 ambulance*.mp. 863 Advanced Display Results | More
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18 (psychological first aid* or CISD* or debriefing* or CISM* or stress management* or support service* or mental health service* or consultation* or training* or desensitization* or EMDR* or medication* or drug* or prolonged exposure* or exposure therapy* or cognitive therapy* or CBT* or cognitive behavioral therapy* or CPT* or cognitive processing therapy* or treatment* or intervention* or psychotherapy* or therapy*).af. 2303186 Advanced Display Results | More
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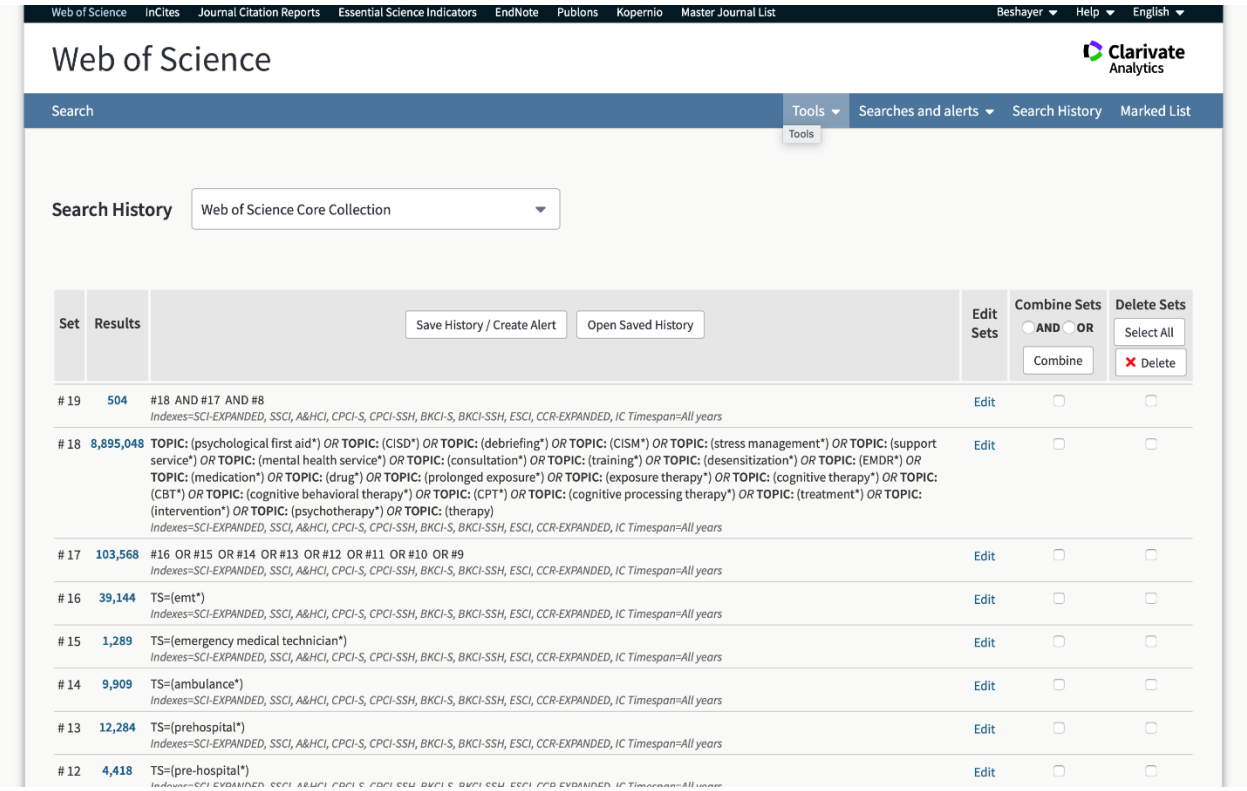
Web of Science InCites Journal Citation Reports Essential Science Indicators EndNote Publons Kopernio Master Journal List
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Web of Science
Clarivate Analytics
Search Tools Searches and alerts Search History Marked List
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Web of Science Core Collection
Set Results
Save History / Create Alert Open Saved History
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Combine Sets AND OR Combine
Delete Sets Select All Delete
# 19 504 #18 AND #17 AND #8
Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH, ESCI, CCR-EXPANDED, IC Timespan=All years
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# 18 8,895,048 TOPIC: (psychological first aid*) OR TOPIC: (CISD*) OR TOPIC: (debriefing*) OR TOPIC: (CISM*) OR TOPIC: (stress management*) OR TOPIC: (support service*) OR TOPIC: (mental health service*) OR TOPIC: (consultation*) OR TOPIC: (training*) OR TOPIC: (desensitization*) OR TOPIC: (EMDR*) OR TOPIC: (medication*) OR TOPIC: (drug*) OR TOPIC: (prolonged exposure*) OR TOPIC: (exposure therapy*) OR TOPIC: (cognitive therapy*) OR TOPIC: (CBT*) OR TOPIC: (cognitive behavioral therapy*) OR TOPIC: (CPT*) OR TOPIC: (cognitive processing therapy*) OR TOPIC: (treatment*) OR TOPIC: (intervention*) OR TOPIC: (psychotherapy*) OR TOPIC: (therapy)
Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH, ESCI, CCR-EXPANDED, IC Timespan=All years
Edit
# 17 103,568 #16 OR #15 OR #14 OR #13 OR #12 OR #11 OR #10 OR #9
Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH, ESCI, CCR-EXPANDED, IC Timespan=All years
Edit
# 16 39,144 TS=(emt*)
Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH, ESCI, CCR-EXPANDED, IC Timespan=All years
Edit
# 15 1,289 TS=(emergency medical technician*)
Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH, ESCI, CCR-EXPANDED, IC Timespan=All years
Edit
# 14 9,909 TS=(ambulance*)
Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH, ESCI, CCR-EXPANDED, IC Timespan=All years
Edit
# 13 12,284 TS=(prehospital*)
Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH, ESCI, CCR-EXPANDED, IC Timespan=All years
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12 4,418 TS=(pre-hospital*)
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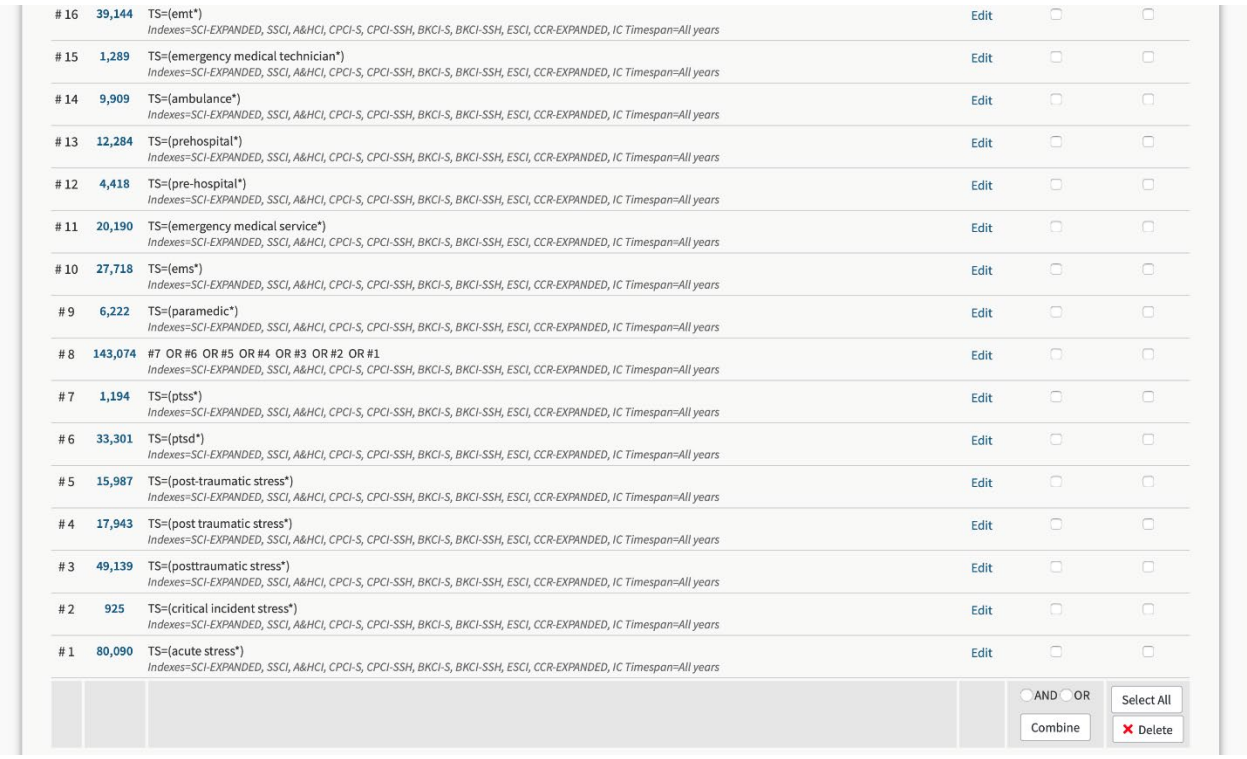

# 16	39,144	TS=(emt*) *Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH, ESCI, CCR-EXPANDED, IC Timespan=All years*	Edit	☐	☐
# 15	1,289	TS=(emergency medical technician*) *Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH, ESCI, CCR-EXPANDED, IC Timespan=All years*	Edit	☐	☐
# 14	9,909	TS=(ambulance*) *Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH, ESCI, CCR-EXPANDED, IC Timespan=All years*	Edit	☐	☐
# 13	12,284	TS=(prehospital*) *Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH, ESCI, CCR-EXPANDED, IC Timespan=All years*	Edit	☐	☐
# 12	4,418	TS=(pre-hospital*) *Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH, ESCI, CCR-EXPANDED, IC Timespan=All years*	Edit	☐	☐
# 11	20,190	TS=(emergency medical service*) *Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH, ESCI, CCR-EXPANDED, IC Timespan=All years*	Edit	☐	☐
# 10	27,718	TS=(ems*) *Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH, ESCI, CCR-EXPANDED, IC Timespan=All years*	Edit	☐	☐
# 9	6,222	TS=(paramedic*) *Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH, ESCI, CCR-EXPANDED, IC Timespan=All years*	Edit	☐	☐
# 8	143,074	#7 OR #6 OR #5 OR #4 OR #3 OR #2 OR #1 *Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH, ESCI, CCR-EXPANDED, IC Timespan=All years*	Edit	☐	☐
# 7	1,194	TS=(ptss*) *Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH, ESCI, CCR-EXPANDED, IC Timespan=All years*	Edit	☐	☐
# 6	33,301	TS=(ptsd*) *Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH, ESCI, CCR-EXPANDED, IC Timespan=All years*	Edit	☐	☐
# 5	15,987	TS=(post-traumatic stress*) *Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH, ESCI, CCR-EXPANDED, IC Timespan=All years*	Edit	☐	☐
# 4	17,943	TS=(post traumatic stress*) *Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH, ESCI, CCR-EXPANDED, IC Timespan=All years*	Edit	☐	☐
# 3	49,139	TS=(posttraumatic stress*) *Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH, ESCI, CCR-EXPANDED, IC Timespan=All years*	Edit	☐	☐
# 2	925	TS=(critical incident stress*) *Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH, ESCI, CCR-EXPANDED, IC Timespan=All years*	Edit	☐	☐
# 1	80,090	TS=(acute stress*) *Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH, ESCI, CCR-EXPANDED, IC Timespan=All years*	Edit	☐	☐
				○ AND ○ OR Combine	Select All ✕ Delete

APPENDIX 3: RISK OF BIAS FOR RANDOMISED-CONTROL TRIALS (RCTS) USING THE COCHRANE COLLABORATION RISK OF BIAS TOOL.

RCT studies	Selection bias		Performance bias	Detecting bias	Attribution bias	Reporting bias	Overall bias
	Random sequence generation	Allocation concealment	Blinding (participants and personnel)	Blinding (outcome assessment)	Incomplete outcome data	Selective reporting	
van der Meer et al., 2020	low	unclear	unclear	unclear	high	unclear	unclear
Jarero et al., 2013	low	unclear	unclear	low	unclear	unclear	unclear
Jarero, Schnaider and Givaudan, 2019	low	low	low	low	low	low	low
Bryant et al., 2019	low	unclear	low	low	low	low	low

APPENDIX 4: RISK OF BIAS FOR NON-RCTS USING THE ROBINS-I TOOL

Observational studies	Selection	Bias due to deviations from intended interventions	Bias in classification of interventions	Bias in measurement of outcomes	Selective reporting	Confounding	Missing data	Overall bias
Warren, 1997	serious	serious	moderate	serious	no information	moderate	no information	serious
Macnab et al., 1999	low	low	no information	moderate	no information	low	low	low
Halpern et al., 2014	serious	serious	serious	serious	moderate	serious	low	serious
Wesemann et al., 2020	serious	no information	no information	no information	no information	no information	no information	unclear
Woods, 2007	moderate	moderate	moderate	moderate	no information	moderate	no information	moderate
Wee et al., 1999	low	low	low	low	moderate	moderate	no information	moderate

APPENDIX 5: SURVEY FRONT PAGE AND QUESTIONS

Survey Participant information sheet and consent form

You are invited to participate in an online survey as part of the study 'Tailoring interventions to minimise the impact of trauma on emergency medical service personnel in the United Arab Emirates.' This study is being conducted by Beshayer Alrum, a PhD student at The University of Sheffield, UK. This short survey should take approximately 15 minutes to complete. Please take time to read the following information. I am happy to answer any further questions you may have.

The study

This study aims to explore ways to develop potential interventions that would help mitigate the effect of traumatic (distressing) cases on emergency medical personnel working in the United Arab Emirates (UAE). The study aims to adapt interventions found to be effective in other settings to the UAE context. Data for the study will be collected through interviews with frontline staff, supervisors and managers of UAE ambulance organisations. This survey is intended to recruit eligible participants for the study to ensure that a range of staff are represented in the research. Please note that this information sheet describes the survey part of the study.

Who can take part in the survey?

You are invited to participate in this survey if

- You are an EMT, paramedic, or advance paramedic working in the field; and
- You have been working in this role for at least three years.

Is it mandatory to take part?

No, participating in this study is completely voluntary. It is up to you to decide whether or not to participate. You are not compelled to participate in this survey just because your organisation is involved in the study, and you are free to refuse to answer any particular question you do not wish to answer for any reason.

What will happen after participating in this survey?

Following the completion of the survey, the researcher will select several participants for interviews based on the criteria defined for this study to ensure a range of staff are represented/included in the interviews. Face-to-face (or online) interviews will be conducted with the chosen sample at a later stage. These will include more detailed questions regarding experiences of traumatic cases and strategies used to reduce the personal impact of these cases.

Please provide your email address at the end of the survey only if you are willing to be contacted by the researcher regarding an additional face-to-face (or online) interview. More detailed information about the interviews will be given to those who agree to participate.

What are the possible benefits of taking part?

There are no direct benefits of taking part in this survey. However, your responses will assist the researcher in selecting eligible participants for the interview part of the study. This will help to achieve the main purpose of the study which is to understand personal experiences of and coping strategies used by emergency medical responders in order to adapt interventions that are effective in minimising the impact of trauma on these individuals.

What are the possible risks?

Some of the survey questions ask about distressing cases. These questions may be upsetting because they will ask you to think about such cases.

Will participation be confidential?

All information collected for the study will be kept strictly confidential. Your employer will not have permission to access the completed questionnaire. Personal identifying information will be removed from the survey responses and stored separately until no longer needed for the interview study.

The study will adhere to the ethical considerations and relevant guidance set by the University of Sheffield. At the end of the survey, you will be asked if you are interested in participating in the interviews. Nevertheless, no names or identifying information will be included in any publication or presentation based on these data, as they will remain confidential.

What is the legal basis for processing my personal data?

Data gathered will be handled in accordance with the Data Protection Act 2018 and the General Data Protection Regulation (GDPR). The legal basis for processing your personal information is described by Article 6(1)(e) of the GDPR, which allows processing when the 'processing is necessary for the performance of a task carried out in the public interest or in the exercise of official authority vested in the controller.' For more details, please refer to the link below:

https://www.gov.uk/data-protection

As we will collect some data that the legislation defines as more sensitive, we are also applying the following legal condition: that the use of your data is 'necessary for scientific or historical research purposes.'

Further information can be found in the University's GDPR and Data Protection Policy:

https://www.sheffield.ac.uk/govern/data-protection/privacy/general

What will happen to the results of the study?

The study findings will be published in a report. The results might also be used for other academic reports, such as conference presentations and journal articles. It will not be possible to identify you in any of the published findings.

Who is organising and funding the study?

This study is funded by the Ministry of Education in the United Arab Emirates and will be carried out by a PhD student in the School of Health and Related Research (ScHARR) at the University of Sheffield.

Who is the Data Controller?

The University of Sheffield will act as the Data Controller for this study. This means that the University is responsible for looking after your information and using it properly.

Who has ethically reviewed the study?

The study has been reviewed by the research ethics committees of two relevant bodies: the University of Sheffield and Dubai Corporation for Ambulance Services.

Who should you contact for further information?

In case you have concerns or require further clarification regarding this research, please feel free to contact the researcher at:

Name: Beshayer Alrum
Email: baalrum1@sheffield.ac.uk
Address: 1.03, Desk 317, First Floor, The Innovation Centre, Regent Court (ScHARR)

You may also contact the primary supervisor at:

Name: Prof. Scott Weich
Email: s.weich@sheffield.ac.uk

If you have any complaints, please contact the researcher or her primary supervisor in the first instance. If you are still not satisfied, please contact the University's Dean of the School for Health and Related Research:

Name: Professor John E Brazier
Phone: +44 114 222 0726
Email: j.e.brazier@sheffield.ac.uk

For further information regarding how your personal data is being handled or for related complaints, please contact Luke Thompson, Head of Data Protection and Legal Services, the University of Sheffield Data Protection Officer at dataprotection@sheffield.ac.uk

Thank you for your time.

ELECTRONIC CONSENT: Please select your choice below. You may print a copy of this consent form for your records. Clicking on the 'Agree' button indicates that

- You have read and understood the project information sheet dated 09/2020 (If you answer 'Disagree' to this question, please do not proceed with this consent form until you are fully aware of what your participation in the project will mean.)
- You have been given the opportunity to ask questions about the project via provided email
- You voluntarily agree to participate. You understand that taking part in the project will include completing an online questionnaire and that you can drop out of the study by choosing not to click on the submit button of online questionnaire
- You understand that your data will be securely retained by the researcher and it will be deleted from the survey system when completing the study's interviews
- You understand that this study collects some personal information, including sex, age, nationality and education qualification. Personal information will not be revealed to people outside the project
- You understand and agree that your data will only be shared with the researcher's supervisors
- You understand and agree that your data (including your email address if provided) will be destroyed when the researcher selects potential participants for the interview
  - Agree
  - Disagree

Survey Questionnaire

1. Gender

- Male
- Female

2. Nationality: .....

3. Age

- 18–24 years old
- 25–34 years old
- 35–44 years old
- 45–54 years old
- More than 54 years old

4. Educational qualifications

- Emergency medical technician – basic
- Emergency medical technician – paramedic
- Advanced paramedic
- Emergency physician
- Other

5. Have you been certified for this degree inside the United Arab Emirates?

- Yes
- No

6. Years of service as frontline staff

- Less than 2 years
- 2–4 years
- 4–6 years
- 6–8 years
- 8–10 years
- More than 10 years

7. Location of employment

- Abu Dhabi
- Dubai

8. Have you dealt with a distressing case in the past year? Examples include child death, mass casualty incidents, threats or violence against yourself or your coworkers and treating patients who are related to you.

- ○ Yes, in the past 3 months
- ○ Yes, in the past 6 months
- ○ Yes, more than 6 months ago
- ○ Never
- ○ I can't remember

9. Could you briefly state the type of incident?.....

10. The following are symptoms that you might have experienced after encountering a critical (distressing) case. Please tick the box according to how often you have experienced these symptoms since the case (one tick per question).

	Not at all	Rarely	Sometimes	Most of the time
Recurrent thoughts or memories of the case				
Feelings as if the case events are happening again				
Recurrent nightmares about the case				
Sudden emotional or physical reactions when reminded of the case				
Avoiding activities that remind you of the case				
Avoiding thoughts or feelings related to the case				
Feeling jumpy or easily frightened				
Feeling on-guard or overly cautious				

Note: adapted from "PTSD-8: A Short PTSD Inventory", Hansen, M., Andersen, T., Armour, C., Elklit, A., Palic, S. and Mackrill, T., 2010, *Clinical Practice & Epidemiology in Mental Health*, 6(1), pp.101-108.

11. How long after the incident (the distressing case) did these difficulties begin?

- ○ Less than 6 months
- ○ More than 6 months

12. How long have you had these incident-related difficulties?

- ○ Less than 1 month
- ○ More than 1 month

13. Are you interested in participating in an interview? If yes, please write your email address in the section below.
    Participant's email address:.....

Thank you for your time spent taking this survey.

APPENDIX 6: PARTICIPANT INFORMATION SHEET FOR FRONTLINE STAFF

Participant information sheet for frontline Staff

Study title: Tailoring interventions to minimise the effect of traumatic situations on emergency medical service (EMS) personnel in the United Arab Emirates (UAE): A qualitative study

You are being invited to take part in a study. Before you decide whether you want to participate, it is important that you understand the purpose of this study and what it involves. Please read the following information carefully. You may discuss it with others if you wish. Please do not hesitate if you have any questions or need more clarification regarding the study. Take time to decide whether or not you wish to participate.

This study is being conducted by a PhD student from the School of Health and Related Research (ScHARR) at the University of Sheffield, UK. The main purpose of the study is to identify ways to adapt existing interventions that help EMS personnel to manage the effect of traumatic situations to fit the local context of the UAE.

Why have you been invited to participate?

You have been invited to participate in the study due to the importance of your experiences and views about coping with critical incidents, as well as your perspective on the effectiveness of existing workplace interventions.

Is it mandatory to participate?

No, participation in this study is completely voluntary. It is up to you to decide whether or not to participate. You are also free to refuse to answer any particular question for any reason.

If you do decide to participate, the researcher will provide you with a copy of this information sheet for you to keep. Then, you will be asked to sign a consent form. Your participation in this study will consist mainly of an interview (either face-to-face or online) that will take place at a time that is convenient to you. Even if you decide to take part, it is your right to withdraw from the study at any time without giving a reason.

If you decide to withdraw, any information collected from you can be excluded from this study at your request. You do not have to give any reason, and you will suffer no adverse consequences if you choose to withdraw. If you request to withdraw within a week after the interview, your data will be deleted. However, if your data has already been anonymised and analysed, it will not be possible to identify it as yours or delete it.

What will participating involve?

You will participate in face-to-face (or online) interview that will allow you to provide your views and opinions about what is effective in dealing and coping with distressing cases.

The researcher will record the interview using an encrypted digital recorder. The interviews will last for approximately 45-60 minutes. All of the interviews will also be transcribed verbatim.

What are the possible benefits of taking part?

There are no direct benefits of taking part in this study. However, through participating, you will help to identify potential interventions to reduce or manage stress resulting from critical incidents (trauma) among emergency medical personnel working in the UAE.

What are the possible risks?

There is a risk that you may find some questions to be sensitive, as some of the questions will involve discussing your experience in dealing with critical incidents, which may cause emotional discomfort.

What will happen to the audio recordings?

You may withdraw your consent before, during or after the interview is recorded. If you choose to withdraw, the data gathered by the researcher will be deleted, providing that the analysis has not begun. You can request to stop the recording for any reason. All information collected for the research will be kept confidential, and only the researcher and the research team (her supervisors) will be able to access the restricted folder on the university's shared network file system (secured folder).

Anonymised transcripts will be made from these recordings. All recordings will be deleted at the end of the study, and anonymous transcripts will be deleted following the completion of the researcher's PhD and all related publications (within a 5-year period).

Will participation be confidential?

All the information collected for the study will be kept strictly confidential. Your employer will not have permission to access the recordings and transcripts of the interviews, and your responses will remain anonymous. The data collected (including the transcripts) will be identified by a unique identification code rather than your name. Audio recordings and accompanying notes will be stored securely, and access will be limited to the researcher and the supervisors. Moreover, no names or identifying information will be included in any publications or presentations based on these data, as they will remain confidential. However, in rare situations (such as safeguarding), the interviewer will have legal obligations that override confidentiality agreements. Therefore, in such cases, the researcher will contact someone from the organisation who is able to provide the needed support (for instance someone from the health and safety section).

The study will adhere to ethical considerations and relevant guidance set by the University of Sheffield.

What is the legal basis for processing my personal data?

Data gathered will be handled in accordance with the Data Protection Act 2018 and the General Data Protection Regulation (GDPR). The legal basis for processing your personal information is described by Article 6(1)(e) of the GDPR, which allows processing when the 'processing is necessary for the performance of a task carried out in the public interest or in the exercise of official authority vested in the controller.' For more details, please refer to the link below:

https://www.gov.uk/data-protection

As we will collect some data that the legislation defines as more sensitive, we are also applying the following legal condition: that the use of your data is 'necessary for scientific or historical research purposes.'

Further information can be found in the University's GDPR and Data Protection Policy:

https://www.sheffield.ac.uk/govern/data-protection/privacy/general

What will happen to the results of the study?

The study findings will be published in a report. The results might also be used for other academic reports, such as conference presentations and journal articles. It will not be possible to identify you in any of the published findings.

Who is organising and funding the study?

This study is funded by the Ministry of Education in the United Arab Emirates and will be carried out by a PhD student in the School of Health and Related Research (ScHARR) at the University of Sheffield.

Who is the Data Controller?

The University of Sheffield will act as the Data Controller for this study. This means that the University is responsible for looking after your information and using it properly.

Who has ethically reviewed the study?

The study has been reviewed by the research ethics committees of two relevant bodies: the University of Sheffield and Dubai Corporation for Ambulance Services.

Who should you contact for further information?

In case you have concerns or require further clarification regarding this research, please feel free to contact the researcher at:

Name: Beshayer Alrum
Email: baalrum1@sheffield.ac.uk
Address: 1.03, Desk 317, First Floor, The Innovation Centre, Regent Court (ScHARR)

You may also contact the primary supervisor at:

Name: Prof. Scott Weich
Email: s.weich@sheffield.ac.uk

If you have any complaints, please contact the researcher or her primary supervisor in the first instance. If you are still not satisfied, please contact the University's Dean of the School for Health and Related Research:

Name: Professor John E Brazier
Phone: +44 114 222 0726
Email: j.e.brazier@sheffield.ac.uk

For further information regarding how your personal data is being handled or for related complaints, please contact Luke Thompson, Head of Data Protection and Legal Services, the University of Sheffield Data Protection Officer at dataprotection@sheffield.ac.uk

Thank you for your time.

APPENDIX 7: PARTICIPANT INFORMATION SHEET FOR MANAGERS AND SUPERVISORS

Participant information sheet for managers and supervisors

Study title: Tailoring interventions to minimise the effect of traumatic situations on emergency medical service (EMS) personnel in the United Arab Emirates (UAE): A qualitative study

You are being invited to take part in a study. Before you decide whether you want to participate, it is important that you understand the purpose of this study and what it involves. Please read the following information carefully. You may discuss it with others if you wish. Please do not hesitate if you have any questions or need more clarification regarding the study. Take time to decide whether or not you wish to participate.

This study is being conducted by a PhD student from the School of Health and Related Research (ScHARR) at the University of Sheffield, UK. The main purpose of the study is to identify ways to adapt existing interventions that help EMS personnel to manage the effect of traumatic situations to fit the local context of the UAE.

Why have you been invited to participate?

You have been invited to participate in the study due to the importance of your views and insights about exploring ways to adapt interventions aimed at reducing the impact of trauma on the mental health of frontline staff, as well as your perspective on the implementation of interventions that have been shown to be effective in other settings.

Is it mandatory to participate?

No, participation in this study is completely voluntary. It is up to you to decide whether or not to participate. You are also free to refuse to answer any particular question for any reason.

If you do decide to participate, the researcher will provide you with a copy of this information sheet for you to keep. Then, you will be asked to sign a consent form. Your participation in this study will consist mainly of an interview (either face-to-face or online) that will take place at a time that is convenient to you. Even if you decide to take part, it is your right to withdraw from the study at any time without giving a reason.

If you decide to withdraw, any information collected from you can be excluded from this study at your request. You do not have to give any reason, and you will suffer no adverse consequences if you choose to withdraw. If you request to withdraw within a week after the interview, your data will be deleted. However, if your data has already been anonymised and analysed, it will not be possible to identify it as yours or delete it.

What will participating involve?

You will participate in face-to-face (or online) interview that will allow you to provide your views and opinions about what is successful in minimising the effects of distressing cases (trauma) on EMS personnel. The researcher will record the interviews using an encrypted digital recorder. The interviews will last for approximately 45-60 minutes. All of the interviews will also be transcribed verbatim.

What are the possible benefits of taking part?

There are no direct benefits of taking part in this study. However, through participating, you will help to identify potential interventions to reduce or manage stress resulting from critical incidents (trauma) among emergency medical personnel working in the UAE.

What are the possible risks?

There are no known risks associated with participating in the study.

What will happen to the audio recordings?

You may withdraw your consent before, during or after the interview is recorded. If you choose to withdraw, the data gathered by the researcher will be deleted, providing that the analysis has not begun. You can request to stop the recording for any reason. All information collected for the research will be kept confidential, and only the researcher and the research team (her supervisors) will be able to access the restricted folder on the university's shared network file system (secured folder).

Anonymised transcripts will be made from these recordings. All recordings will be deleted at the end of the study, and anonymous transcripts will be deleted following the completion of the researcher's PhD and all related publications (within a 5-year period).

Will participation be confidential?

All the information collected for the study will be kept strictly confidential. Your employer will not have permission to access the recordings and transcripts of the interviews, and your responses will remain anonymous. The data collected (including the transcripts) will be identified by a unique identification code rather than your name. Audio recordings and accompanying notes will be stored securely, and access will be limited to the researcher and the supervisors. Moreover, no names or identifying information will be included in any publications or presentations based on these data, as they will remain confidential. However, in rare situations (such as safeguarding), the interviewer will have legal obligations that override confidentiality agreements.

The study will adhere to ethical considerations and relevant guidance set by the University of Sheffield.

What is the legal basis for processing my personal data?

Data gathered will be handled in accordance with the Data Protection Act 2018 and the General Data Protection Regulation (GDPR). The legal basis for processing your personal information is described by Article 6(1)(e) of the GDPR, which allows processing when the 'processing is necessary for the performance of a task carried out in the public interest or in the exercise of official authority vested in the controller.' For more details, please refer to the link below:

https://www.gov.uk/data-protection

As we will collect some data that the legislation defines as more sensitive, we are also applying the following legal condition: that the use of your data is 'necessary for scientific or historical research purposes.'

Further information can be found in the University's GDPR and Data Protection Policy:

https://www.sheffield.ac.uk/govern/data-protection/privacy/general

What will happen to the results of the study?

The study findings will be published in a report. The results might also be used for other academic reports, such as conference presentations and journal articles. It will not be possible to identify you in any of the published findings.

Who is organising and funding the study?

This study is funded by the Ministry of Education in the United Arab Emirates and will be carried out by a PhD student in the School of Health and Related Research (ScHARR) at the University of Sheffield.

Who is the Data Controller?

The University of Sheffield will act as the Data Controller for this study. This means that the University is responsible for looking after your information and using it properly.

Who has ethically reviewed the study?

The study has been reviewed by the research ethics committees of two relevant bodies: the University of Sheffield and Dubai Corporation for Ambulance Services.

Who should you contact for further information?

In case you have concerns or require further clarification regarding this research, please feel free to contact the researcher at:

Name: Beshayer Alrum
Email: baalrum1@sheffield.ac.uk
Address: 1.03, Desk 317, First Floor, The Innovation Centre, Regent Court (ScHARR)

You may also contact the primary supervisor at:

Name: Prof. Scott Weich
Email: s.weich@sheffield.ac.uk

If you have any complaints, please contact the researcher or her primary supervisor in the first instance. If you are still not satisfied, please contact the University's Dean of the School for Health and Related Research:

Name: Professor John E Brazier
Phone: +44 114 222 0726
Email: j.e.brazier@sheffield.ac.uk

For further information regarding how your personal data is being handled or for related complaints, please contact Luke Thompson, Head of Data Protection and Legal Services, the University of Sheffield Data Protection Officer at dataprotection@sheffield.ac.uk

Thank you for your time.

APPENDIX 8: INTERVIEW GUIDE FOR FRONTLINE STAFF

- **Description of their role (Ice breaker)**

Could you please tell me about your role?

How long you have been in this role?

Why did you choose this career?

- **Experience of a distressing case**
  - Would it be fine to talk about a critical case that you experienced? Please tell me about it.
  - What sort of feelings and thoughts did you have that day (following the case)? What about later (days or weeks after the case)?

    Probes: What was different about this case? Have you had a similar experience / reaction to a case before, if yes, when? if no, what was different?

- **Coping strategies they used**
  - What do you do to manage the stress from your role/this case?
  - Who did you talk to (for instance, colleagues, friends, family)?

    Probes: was that helpful? What helped you the most?
  - Was there anything that stopped you from taking up professional support?
  - if a colleague asked you for advice on how to manage their feelings after a stressful event, what would you recommend?

    Probes: why would you recommend that?

- **What support is available to them in general**
  - What types of interventions has your employer offered after dealing with that case?

    Probes: how useful is this support? Are you happy to take up the support?
  - Do you think staff who work on the frontline (your colleagues) are aware of the support available?
  - Do you think staff on the frontline (your colleagues) are willing to seek support?

    Probes: if no, why do they think this is?

- **What support they would like to be available**
  - if you were responsible for developing a support system for front line workers what would it look like?
  - who would you target the support to?
  - where would it be delivered? And when (for instance, days after a critical case or in a regular basis?)
  - How would you make it attractive to those on the frontline who don't traditionally access help/support?
- **Conclusion**
  - Is there anything else that you would like to add?

APPENDIX 9: INTERVIEWS GUIDE FOR MANAGERS AND SUPERVISORS

- Could you tell me more about yourself and your role in the organisation?
- What kind of support/help has been offered to staff with regard to managing trauma-related stress?

  Probes: Do staff make use of the support and help?

  If not, why do you think staff do not take up the support available (Barrier)?

  What could be done to encourage staff to take up the support (facilitator)?
- If any support/intervention has been offered: How do you know which interventions staff value most? How was the current programme of support established? (for instance, who set it up and why?)

  Probes: Are there any parts of the support that staff do not use?

  Why do you think that is?
- Can you describe how the organisation supports staff training on resilience?

  Probes: how often?

  where are they delivered?

  Do they have feedback from staff on who have attended?

  What role do you think training in resilience has on reducing trauma related stress?
- If you were responsible for designing a new programme of support in your organisation, which one of these interventions would you be willing to consider? (A brief explanation will be provided of each intervention)
  - Expressing (debriefing) feelings and thoughts
  - Downtime (time out of service) following a traumatic incident
  - Cognitive Behavioural Therapy (CBT)
  - Eye Movement Desensitization and Reprocessing (EMDR)
  - SUPPORT Coach (self-help) app

  Probes: why do you think this one would work in your setting?

  Can you tell me more (is likely to be needed on this one) about why you think that?

- In your opinion, which of the aforementioned interventions would be most appealing to staff? Why?

  Probe: or most acceptable to them?

  Do you think this will vary by cultural beliefs or perceptions of stigma?

- As a manager, what other factors do you take into account when considering staff development of frontline staff? (Is it likely that they might simply focus on practical skills/ capability rather than mental health and wellbeing? If they do, then this will give you greater insight into how such interventions would be prioritised in reality)

- What other information/resources would you need to have before your organisation could implement a new intervention for staff resilience?

  Probes: what would stop the organisation from introducing these kinds of interventions?

  How would you work with staff to ensure they would be willing to take up the support?

- In your opinion how much impact do you think the location of the support has on staff's willingness to take up the support (in other words, where do you think the support should be provided)?

  Probes: internal (within the organisation) or an external venue?

  why do you think that?

  How willing would the organisation be to deliver the support externally, if the staff would prefer this option?

- Is there anything else you would like to add?

APPENDIX 10: UNIVERSITY APPROVAL

The University Of Sheffield.

Downloaded: 12/10/2020
Approved: 12/10/2020

Beshayer Alrum
Registration number: 180274994
School of Health and Related Research
Programme: Standard PhD in the School of Health & Related Research

Dear Beshayer

PROJECT TITLE: Tailoring interventions to reduce or prevent posttraumatic stress symptoms amongst emergency medical service personnel in the United Arab Emirates: A qualitative study
APPLICATION: Reference Number 035960

On behalf of the University ethics reviewers who reviewed your project, I am pleased to inform you that on 12/10/2020 the above-named project was **approved** on ethics grounds, on the basis that you will adhere to the following documentation that you submitted for ethics review:

- University research ethics application form 035960 (form submission date: 09/10/2020); (expected project end date: 02/02/2023).
- Participant information sheet 1082216 version 1 (17/08/2020).
- Participant information sheet 1082215 version 2 (01/10/2020).
- Participant information sheet 1082844 version 1 (01/10/2020).
- Participant information sheet 1082214 version 3 (01/10/2020).
- Participant consent form 1082217 version 2 (01/10/2020).

If during the course of the project you need to deviate significantly from the above-approved documentation please inform me since written approval will be required.

Your responsibilities in delivering this research project are set out at the end of this letter.

Yours sincerely

Jennifer Burr
Ethics Administrator
School of Health and Related Research

Please note the following responsibilities of the researcher in delivering the research project:

- The project must abide by the University's Research Ethics Policy: https://www.sheffield.ac.uk/rs/ethicsandintegrity/ethicspolicy/approval-procedure
- The project must abide by the University's Good Research & Innovation Practices Policy: https://www.sheffield.ac.uk/polopoly_fs/1.671066!/file/GRIPPolicy.pdf
- The researcher must inform their supervisor (in the case of a student) or Ethics Administrator (in the case of a member of staff) of any significant changes to the project or the approved documentation.
- The researcher must comply with the requirements of the law and relevant guidelines relating to security and confidentiality of personal data.
- The researcher is responsible for effectively managing the data collected both during and after the end of the project in line with best practice, and any relevant legislative, regulatory or contractual requirements.

APPENDIX 11: DCAS ETHICAL APPROVAL

GOVERNMENT OF DUBAI

DCAS-MA-

Ambulance

APPLICATION FOR ETHICAL CLEARANCE

Dubai Corporation for Ambulance Services – Medical Accreditation & Research Division

Instructions to fill the application form

- Please read the *Ethical Clearance Guidelines* before completing this form to determine whether you are eligible for an ***Exemption from Full Application for Ethical Clearance***.
- The application must be clearly legible
- Typing or block capitals are recommended
- All sections of the application form must be completed, incomplete application will not be reviewed
- Write "Not Applicable" wherever appropriate
- Please read the *Ethical Clearance Guidelines* before completing this form to determine whether you are eligible for an *Exemption from Full* Application for Ethical Clearance.
- Completed forms must be submitted to the Medical Accreditation & Research Section- DCAS.
- For more information, contact the Medical Research & Accreditation Section- DCAS with any specific questions regarding their application.

PART 1 - PROJECT INFORMATION

1.1 PROJECT TITLE:	
Tailoring interventions to reduce or prevent posttraumatic stress symptoms amongst emergency medical service personnel in the United Arab Emirates: A qualitative study	
1.2 PROJECT TIMELINE: Data collection period	
Proposed starting date: 30/8/2020	Proposed completion date: 30/11/2020
1.3 PROJECT LOCATION:	
DCAS (& associated ambulance units)	
1.4 Type of the Project: (Please Tick ALL that is applicable)	
☐ Community Based ☐ Device Study ☐ Records and Data Study ☐ Biomedical Study ☑ Health Related Study ☐ Social Behavior Study ☐ Research Involves Human or Animal Subjects ☐ Other	
1.5 Has this research proposal been approved by a Research Ethics Committee elsewhere?	
☑ NO (in the process of applying for ethical approval from the School of Health and Related Research at the university of Sheffield)	☐ YES If Yes please provide: - Name of institution that reviewed this research proposal: - Address:

PART 2 – PROJECT PARTICIPANTS

2.1 Principal Invistigator			
Name:	Beshayer Alrum	Organization:	DCAS
Title:	Miss	Position:	Advanced Paramedic
Phone:	0551152622	Email:	bmohammad@dcas.gov.ae

2.2 List all Co-Researchers			
Name	Role in Research Project	Organization	Email
1. Prof. Scott Weich	Academic Supervisor (lead supervisor)	Sheffield university	s.weich@sheffield.ac.uk
2. Dr. Rachel O'Hara	Academic Supervisor	Sheffield university	r.ohara@sheffield.ac.uk
3.			

APPROVED DCAS RESEARCH 09-Aug-20

PART 3 – PROJECT FUNDING, PURPOSE AND RESEARCH DESIGN

3.1 Funding source	
Is project funded?	☐No ☑YES - Mention Funding Source: ……Ministry of Education in the UAE……

3.2 Possible conflict of interest
Does Research Participants have financial interest in, receive personal compensation from, or hold a position in an industry sponsoring this study?

☑No
☐YES - Please provide details: ……

3.3 Purpose of Research Project
Brief summary below 300 words or less of the purpose of the project

Please provide summary:

Emergency medical service (EMS) workers often encounter distressing, traumatic events, also known as critical incidents, due to the nature of their work. The frequent exposure of EMS workers to traumatic events could lead to a range of mental disorders such as acute stress disorder (ASD) and posttraumatic stress disorder (PTSD). Studies found that mental disorders (in particular PTSD) negatively affected the wellbeing of EMS workers, hence impacting their performance and the quality of care. Moreover, prior studies have mainly focused on western cultures. Additional perspectives are needed from other cultures, such as Arabic and Asian, which dominate the UAE context.
Research aim:
To identify potential ways to tailor existing interventions aimed at minimising the effects of posttraumatic stress on EMS personnel to fit the local context of the UAE.
Research objectives:
- To explore the perspectives and experiences of EMS personnel regarding current interventions
- To identify principles to consider when tailoring existing interventions
- To explore staff perspectives on organisational barriers to and facilitators of the implementation and effectiveness of existing interventions
- To present a theoretically driven logic model that serves as a basis for future interventions designed to manage/prevent posttraumatic stress among EMS personnel in the UAE

3.4 Description of the research design, methods and procedures
Description below 300 of the research design (including steps and methodology), Type of data to be collected, outcome measurements

Please provide description:

Semi-structured face-to-face interviews with a sample of 30 respondents (20 paramedics, 5 supervisors and 5 managers) will be conducted to explore the factors that influence the feasibility and deliverability of potential interventions. Questions will be formulated in accordance with the job roles of the selected participants (two separate interview
guides). Interviews with frontline staff (paramedics) will involve questions related to their personal beliefs, their coping strategies and sources of support. Whereas, interviews with managers and supervisors will include questions designed to explore the feasibility and acceptability of tailoring existing interventions, as well as potential ways of doing this.
All interviews will be digitally audio recorded, and notes will be taken to facilitate transcription of the interviews. Data will be analysed using thematic analysis. Coding of transcripts will be carried out through the use of the NVivo qualitative data analysis software.

PART 4 - PROPOSED RESEARCH SUBJECTS :

4.1 Proposed subject representation			
Expected number of subjects:	30	Expected student representation:	None
Expected gender representation:	Not indicated	Expected age of subjects:	Not indicated

4.2 Proposed population and sample size calculation, how many subjects, and who these subjects ideally would be)

Please explain your proposed sampling method:

The population of interest in the study will be comprised of frontline staff (emergency medical technicians, paramedics, and advanced paramedics) who are directly involved in responding to a range of emergency needs, supervisors who are directly charged with providing support for the frontline staff and have worked as paramedics in the past and
department managers who are responsible for ensuring the implementation of the policies and the managing of resources to achieve organisational goals.
Potential participants will be identified through the use of a purposive sampling. This will be done by establishing a short online survey that it will include a number of demographic questions followed by general questions related to coping with critical incidents (to be distributed only to frontline staff) to assist in selecting participants with diverse characteristics for the interviews.

4.3 Characteristics of the study population
Inclusion criteria and exclusion criteria may include age, occupation, gender, health status etc, according to the needs of your research.

Inclusion criteria:	Minimum 3 years of work experience
Exclusion criteria:	Trainees or students

PART 5 - OBTAINING FREE AND INFORMED CONSENT

Individuals have the right to make free and informed decisions about their consent to participate in a research project.

5.1 Vulnerable populations:
If you are planning to involve any of the following population groups in this project, please detail below:

DCAS Staff	☑YES ☐NO	People in prison	☐YES ☑NO
People with a cognitive disablity	☐YES ☑NO	Non-English Speakers	☐YES ☑NO
People with a physical disability	☐YES ☑NO	Students	☐YES ☑NO
Children (5 -18 yrs)	☐YES ☑NO	People in Armed Forces	☐YES ☑NO
Children (under 4 yrs)	☐YES ☑NO	People over 60 years	☐YES ☑NO

5.2 Risk mitigation:
Possible risk factors for subject, including emotional distress, privacy violations, financial damage, lawful danger, physical torment or injury, and also proposed strategy for alleviating such potential risks

Please provide details:

There is no known physical harm or risk associated with the study. However, participants (frontline staff) might experience some emotional distress when being asked about how they coped with the emotional consequences arising from dealing with critical incidents (traumatic events). Therefore, prior to starting the interview, the researcher will explain to the participant that if he or she feels anxious or emotionally overwhelmed, the participant should inform the researcher. Participants will be reminded that they have the right to refuse to answer any question or to stop the interview and withdraw from the study at any time without giving reasons. In cases where a participant withdraws during the interview (e.g., when a participant feels overwhelmed and does not want to continue), the researcher will give him or her then opportunity to request his or her preferred source of support (to talk to a colleague, to go for a walk, etc.).
A line supervisor will also be informed of the situation in cases where the researcher observes that a participant is in distress (e.g., symptoms of psychological stress start to appear, such as hyperventilation and chest tightness) so that the supervisor can provide the most appropriate type of support as soon as possible, in accordance with organisational policies (e.g., a health and safety officer might be involved). Moreover, it is essential that, prior to the interview, participants be reminded of the focus of this study and its purpose. This will

serve to make it clear that the project is not concerned with diagnosing their level of posttraumatic stress nor their experiences of dealing with the traumatic event itself.

5.3 Methods of recruiting Participants and Advertisement:
How do you approach prospective participants. Attach versions of written material, ads, template for telephones, etc.

Please provide details:

The researcher will establish a short online survey in order to recruit eligible employees for the study. This will allow the researcher to select participants from all training levels to maximise variation in experiences and to ensure that selected participants represent different individual characteristics in terms of nationality and years of service. This will assist the researcher in including genders, professionals from different nationalities, and young and old age staff in the study. The front page of the survey will include a consent form, and participants will be asked to leave their email address at the end of the survey only if they are willing to be contacted later by the researcher to be recruited for interviews. The purpose of this survey is for recruiting participants (front-line staff) and it will include a number of demographic questions followed by general questions related to coping with critical incidents. Filling out the survey should not take more than 10-15 minutes. Personal identifying information will be removed from the survey responses and stored separately until no longer needed for the interview study. The researcher will then select participants based on their answers and characteristics and contact them via their email addresses to ask if they are willing to take part in the forthcoming study. In-depth information will then be given to those who agree to participate.

5.4 How will informed consent be obtained?
Details and type of Consent information forms should be added in the suggested subject language.

Please provide details:

As mentioned before, the researcher will create a short online survey in order to recruit eligible employees (frontline staff) for the study. The first page of the survey will include a consent form, and participants will be asked to leave their email address at the end of the survey only if they are willing to be contacted later by the researcher to be recruited for
interviews. The researcher will then select potential participants based on their answers and characteristics and contact them via email to ask whether they are willing to take part in the forthcoming study. Personally identifiable information (email address) will be removed from the survey responses and stored separately until no longer needed for the interview study. In-depth information will then be given to those who agree to participate.
Afterwards, the researcher will ask individuals who agree to participate in the study to sign a consent form, at which point both parties will arrange a mutually agreeable time and location for the interview. Participants will also be advised that they have the right to withdraw from the study at any time without the need to provide their reasoning.

5.5 Are there any anticipated incentives for participation or costs to be borne by subjects ?

Please provide details:
NO

PART 6 - CONFIDENTIALITY AND DATA STORAGE, DATA ANALYSIS AND OUTCOMES

6.1 Confidentiality
Details on Paper or electronic data records keeping measures, security measures applied; plans for anonymizing data; procedures for data sharing with other parties; retention policy

Please provide details:

Before sending invitations to potential participants, the researcher will meet with the operation department managers at the EMS organisations to explain the research purpose and seek approval. Also, meeting with department managers will assist the researcher in writing the required plans and producers that shall be considered in cases where a participant becomes severely distressed during an interview.
The researcher will inform the participants of their rights and remind them that participation in the research will be completely voluntary and that their employer will not have access to the data gathered for the study.

Data will only be shared with supervisors via a secured hard drive. All potential participants will be given an information sheet, written in understandable, everyday language, that will explain the rationale behind and significance of the study. Also, the researcher will give potential participants the opportunity to raise any questions that may influence their decision as to whether to participate in the forthcoming study. If they choose to proceed, they will subsequently be asked to sign the informed consent form. All information provided to potential participants will be written in plain English (Arabic version will be provided if requested/needed). Regarding anonymity and confidentiality, all participants will be informed that their names will not be revealed in this study, and an identification code will be assigned to each interview transcription. Participants will be assured that their personally identifiable information will be anonymous and kept in a locked drawer in the researcher's home (accessible only to the researcher). Finally, the researcher will notify potential participants that data will only be shared with supervisors through an access-restricted folder on the university's secured drive. Participants have the right to withdraw from the study if they do not want to be recorded or for any other reason. The researcher will record the interviews using encrypted digital recordings before transferring them to an access restricted folder on the university's secured drive. After that, all data will be deleted from the encrypted digital recordings. Only the researcher and her supervisors will be able to access the access-restricted folder on the university's secured drive. Backed-up copies will be saved on an encrypted hard drive (with a capacity of 10 TB) that will be kept in a secure location. Access to data stored on local hard drives and devices will be limited to the researcher. The researcher will store hard data (consent forms and notes) in a locked drawer in her home, and only she will have access to it. (The drawer has only one key, which the researcher will keep safe.) Data will be kept for five years and then destroyed/shredded, while voice recordings will be destroyed immediately after transcription.

6.2 Does the study require access to the Electronic Patient Care Records (EPCR) system data of Dubai Corporation for Ambulance Services (DCAS)?

☑NO	☐YES :If Yes please Attach the ***Data Request*** *Form* obtained from Medical Accreditation & Research Section- DCAS

6.3 Data storage and transmission security measures. Select all that apply:

For electronic data:		For hardcopy data (including specimens, tapes)	
Secure network:	☐YES ☑NO	Data anonymized by research team:	☑YES ☐NO
Password access:	☑YES ☐NO	Locked office:	☐YES ☑NO
Encryption:	☑YES ☐NO	Locked cabinet:	☑YES ☐NO
Portable storage: (laptop, flash drive, etc)	☑YES ☐NO	Data coded by research team with master list kept securely	☑YES ☐NO
Other: (provide detail below)	☐YES ☑NO	Other: (provide detail below)	☐YES ☑NO
Please provide details:		Please provide details:	

6.4 Data Analysis
WHERE and by WHOM and HOW will data analysis be performed? Is there adequate training provided to research assistants to manage the type of data being collected?

Please provide details:
The researcher (PI) will analyse the data and both supervisors will have an input and reflect on the anaylsis process that is performed by the researcher.
Data will be analysed using thematic analysis. Coding of transcripts will be carried out through the use of the NVivo qualitative data analysis software.

6.5 Detail the projected outcomes for this research project
Main benefit from the results of this project, proposed publication and distribution tools and timelines. Undertaken for publishing and communicating results should be provided for Human Subjects Research

Please provide details:
The study will contribute to an improvement of the understanding of the relevant pathways which shape effective interventions for reducing posttraumatic stress among this group of professionals. In terms of practice, the findings of the study can be used to develop targeted interventions among emergency medical professionals from a cultural and occupational perspective by exploring their beliefs and cultural systems. This will clarify the main elements that should be addressed when creating or adapting these interventions. This will, in turn, help to mitigate the risk of staff members developing adverse mental health conditions and support them in remaining in their job.

PART 7 - ATTACH ALL RELEVANT DOCUMENTATION

Research proposal.	☑YES
Data collection tools, including surveys, interview questions, etc	☑YES
Informed Consent forms, including translated forms if needed	☑YES
Advertisement or script intended to use when recruiting participants	☐YES ☑NA
Ethical approval for co-investigators, or collaborative institutions	☐YES ☑NA
Principal Investigator's CV	☐YES ☑NA
Co-Investigator's CV	☑YES
Any other relevant documentation	☑YES

PART 8 – Principal Investigator Signature:

- I certify that all investigators involved in this research project have accepted their role in this study.
- I am aware of the relevant health authority requirements for research involving human subjects and the possible consequences and sanctions for non-compliance.
- I agree to a continuing exchange with **Medical Accreditation & Research Section- DCAS** and to obtain approval before making any changes or additions to the project.
- I will provide progress reports at least annually, or as requested, and a final report within 60 days of project completion.
- I agree to report promptly to the **Medical Accreditation & Research Section- DCAS** all unanticipated problems or serious adverse events involving risk to human subjects.

Signature of PI: Beshayer 1182 Date: 8 /8/2020

APPROVED DCAS RESEARCH 09-Aug-20

OFFICE USE ONLY		
Is demographic information collected with cultural sensitivity?	☑ NO ☐ YES	
Does the research involve psychological studies or the study of health-related behaviors?	☐ NO ☑ YES - (DHA) Dubai Research Ethical Committee requirements for human subject's research may apply	
Does the application meet ethical clearance requirements?	☐ NO - Revision Required. ☑ YES	
Detail any revisions or additional information required:	- **Add Cv for PI.** - **Add Confidentiality Agreement for Co-Researchers.** - **All Remaining Requirements Fulfilled.**	
Date received	**Date checked and accepted**	**Date committee approved**
- 08/08/2020 -	- 09/08/2020 -	- 09/08/2020 -
Name of reviewer(s):	**Title:**	**Signature**
Dr. Rashad Gamar Ahmed Ibrahim	Medical Research & Future Foresight Subdivision	[redacted]
Mrs. Saeeda Butti	Medical Accreditation & Research Division	[redacted]
Dr. Omer Alsakaf	Medical & Technical Affairs Department	[redacted]

References: Documentations from Dubai Research Ethical Committee, DHA, (HAAD), Zayed University

APPROVED DCAS RESEARCH 09-Aug-20

APPENDIX 12: NA – ETHICAL APPROVAL

الإسعاف National
الـوطـنـي Ambulance

CGF 153 - Authorisation for clinical study or research activity

This form must be used to ensure that National Ambulance (NA) follows best ethical practices and protocols for proof of concept studies, clinical projects and research activities. The form should be read alongside the NA Ethics Policy and Procedure CGP109 which focuses on the concept of primum non nocere (Do no harm), it aims to protect Patient Rights including confidentiality and privacy of patient related information.
The ethics elements of all NA clinical studies and research activities are considered by the Medical Director (MD) completing this form; if required they are considered further by the NA Clinical Ethics working group (Internal) or Clinical Ethics Committee (including external) as per Appendix 1. Any risks identified may be included on the NA Risk Register. This form is to be used purely for clinical ethical matters, it is not to be used to consider any financial matters.

الإسعاف National
الوطني Ambulance

Name of study/project	Tailoring interventions to minimise the effect of traumatic situations on emergency medical service (EMS) personnel in the United Arab Emirates: A qualitative study
Study design e.g. Cross sectional	A qualitative research design that consists of semi-structured interviews
Hosted/organised by	Beshayer Alrum (in the fulfilment of her PhD degree at the University of Sheffield, UK)
Period of study	Data collections will take place from Oct 21st to Dec 20th of the year 2020
Population of study	Paramedics and supervisors with at least 3 years of experience
Methods	Online semi-structured interviews (via ZOOM or Google Meet)
Risks and risk management	There is no known physical harm or risk associated with the study. However, participants (frontline staff) might experience some emotional distress when being asked about how they coped with the emotional consequences arising from dealing with critical incidents (traumatic events). As part of risk management, participants will be reminded that they have the right to refuse to answer any question or to stop the interview and withdraw from the study at any time without giving reasons. If a participant feels uncomfortable during the interview or exhibits signs of emotional distress, the researcher will stop the interview immediately and will assist the participant to access their preferred source of support. In this case, the researcher will not continue the interview unless the participant asks to do so (e.g., they felt better after taking a break or changing the subject and want to continue the interview). The researcher will also assure the participant that everything is confidential, and if the participant would benefit from a referral to a professional for help, the researcher will take the necessary steps to connect the participant with someone from the organisation (e.g. occupational health specialist) or an external support. This will only be done if the participant asks for or agrees to seek support. Also, prior to the interview, participants be reminded of the focus of this study and its purpose. This will serve to make it clear that the project is not concerned with diagnosing their level of posttraumatic stress nor their experiences of dealing with the traumatic event itself.

Authorized by Medical Director	Yes	No
Referred to Clinical Ethics working group (internal)	Yes	No
Referred to Clinical Ethics committee (including external)	Yes	No
Comments		

Signature 30th Nov 202[redacted] Dr. Ayman Ahmed Medical Director [redacted] NOV 10, 20

APPENDIX 13: CONSENT FORM

The University Of Sheffield.

Interview consent form: Version 2. Sep 2020

Interview Consent Form

'Tailoring interventions to minimise the effect of traumatic situations on emergency medical service (EMS) personnel in the United Arab Emirates: A qualitative study'

Please tick the appropriate boxes	**Yes**	**No**
Participating in the study		
I have read and understood the study's information sheet dated 09/2020 or the study has been fully explained to me. (If you answer 'No' to this question, please do not proceed with this consent form until you are fully aware of what your participation in the project will mean.)	☐	☐
I have been given the opportunity to ask questions about the study.	☐	☐
I agree to participate in the study, and I understand that participating in the study will include being interviewed and audio recorded.	☐	☐
I understand that my participation is completely voluntary and that I can withdraw from the study at any time, including before my data has been analysed (usually one week after the interview). I understand that I do not have to give any reasons for why I no longer want to take part, and that I will suffer no adverse consequences if I choose to withdraw.	☐	☐
How my information will be used during and after the project		
I understand my personal details (such as my name and email address) will not be revealed to people other than the research team (the researcher and their supervisors).	☐	☐
I understand and agree that my words may be quoted in publications, reports, web pages, and other research products. I understand that I will not be named in these products unless I specifically request this.	☐	☐
I understand that my data will be securely retained by the University of Sheffield through the PhD research period and until all expected publications are completed, for a maximum of five years.	☐	☐
Authorisation allowing researchers to use the information you provide		
I agree to assign the copyright I hold in any materials generated as part of this research to the University of Sheffield.	☐	☐

Name of participant Signature Date

Name of researcher Signature Date

Research team contact details:

Name	Phone	Email
Beshayer Alrum (principle investigator)	+447307063011	Baalrum1@sheffield.ac.uk
Prof. Scott Weich (Primary supervisor)	+441142220856	s.weich@sheffield.ac.uk

APPENDIX 14: CERTIFICATE OF CONFIDENTIALITY

Certificate of Confidentiality (CoC)

Project Title: Tailoring interventions to minimise the effect of traumatic situations on emergency medical service (EMS) personnel in the United Arab Emirates (UAE): A qualitative study

All researchers within the School of Health and Related Research (ScHARR) are obligated to follow the ScHARR Information Governance Policy. Researchers within the University of Sheffield are required to manage data in an effective and secure way, in particular that which is personal or sensitive. Information governance (IG) encompasses a set of standards and guidance which describe how information should be handled. You can view the roles, responsibilities and structure for information management governance at the University here: www.sheffield.ac.uk/govern/data-protection

The ScHARR Information Governance Committee is responsible for the creation, dissemination and implementation of information governance policies and processes which demonstrate that researchers within the university can be trusted to maintain confidentiality and security. Information Governance (IG) is the way in which organisations (whether inside or outside the NHS) handle information, in particular that which is considered to be personal or sensitive.

Data gathered will be handled in accordance with the Data Protection Act 2018 and the General Data Protection Regulation (GDPR). The legal basis for processing personal information is described by Article 6(1)(e) of the GDPR, which allows processing when the 'processing is necessary for the performance of a task carried out in the public interest or in the exercise of official authority vested in the controller.' For more details, please refer to the link below:
https://www.gov.uk/data-protection

As the researcher will collect some data that the legislation defines as more sensitive, the university is also applying the following legal condition: that the use of your data is 'necessary for scientific or historical research purposes.' Further information can be found in the University's GDPR and Data Protection Policy:
https://www.sheffield.ac.uk/govern/data-protection/privacy/general

For further information regarding how personal data is being handled or for related complaints, please contact Luke Thompson, Head of Data Protection and Legal Services, the University of Sheffield Data Protection Officer at dataprotection@sheffield.ac.uk

Confidentiality Disclosure Agreement

I hereby acknowledge, by my signature below, that I understand that any details and information gathered for the purpose of this research will not be revealed to people other than the research team (the researcher and his/her academic supervisors) and is to be kept strictly confidential.

I acknowledge that no one will have permission to access the recordings and transcripts of the interviews, and all responses will remain anonymous. Also, data collected (including the transcripts) will be identified by a unique identification code rather than participants' names. Audio recordings and accompanying notes will be stored securely, and access will be limited to the researcher and the supervisors. Moreover, no names or identifying information will be included in any publications or presentations based on these data, as they will remain confidential.

I acknowledge that this study will adhere to ethical considerations and relevant guidance set by the University of Sheffield.

SIGNED by

for and on behalf of The University of Sheffield:

Name: Beshayer Alrum [redacted]

Date: 30th Nov 2020